

The Economics of Imperfect Labor Markets

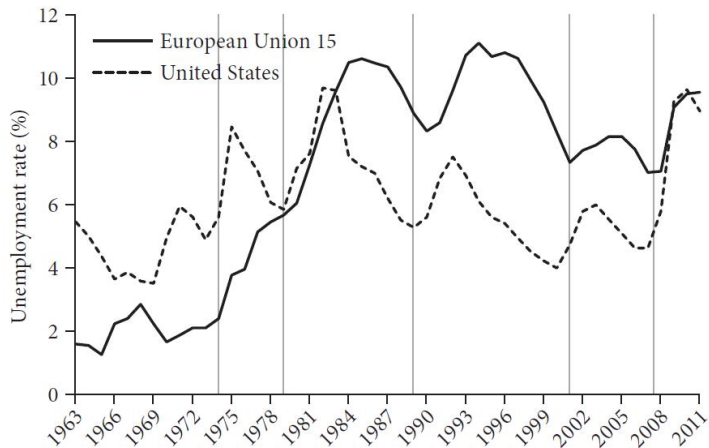
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September 2013

Tito Boeri and Jan van Ours (2013)
The Economics of Imperfect Labor Markets
Princeton University Press

Chapter 1. Overview

Transatlantic differences in unemployment rates



The usual suspects

- Size of the shocks
- Labour Market Institutions

However

Okun's Law

Okun's law:

$$\Delta u_t = \alpha - \beta \Delta y_t + \varepsilon_t \quad (1)$$

possibly also taking into account of time-varying institutions and allowing for asymmetries during recession and non-recession years

Moreover differences in institutions are long-lasting

Literature has a short memory

- 1960s: “Looking enviously at Europe to see how they do it” – employment protection as explanation for low European unemployment
- 1990s: “Europe should adjust its rigid labor market institutions” (OECD Jobs Study, 1994) responsible for higher and longer duration unemployment
- 2010: Krugman ‘Germany’s jobs miracle hasn’t received much attention in this country - but it’s real, it’s striking, (...) Germany came into the Great Recession with strong employment protection legislation.. and a “short-time work scheme,” which provides subsidies to employers who reduce workers’ hours rather than laying them off. These measures didn’t prevent a nasty recession, but Germany got through the recession with remarkably few job losses.”

How to explain differences in unemployment then?

- Interactions between shocks and institutions
- Triple interaction: shocks, nature of shocks and institutions
- Great Recession was a financial recession

Definitions: Labor market states

- Employed, L (OECD-ILO convention): People in working age who, during the reference week (or day), have made for at least one hour:
 - Paid work (also paid in nature) *or*
 - Self-employed work
 - Paid work includes people who are temporarily not working but who have formally paid work (e.g. they have a salary, are on maternity leave, etc.)

Labor market states (cont.)

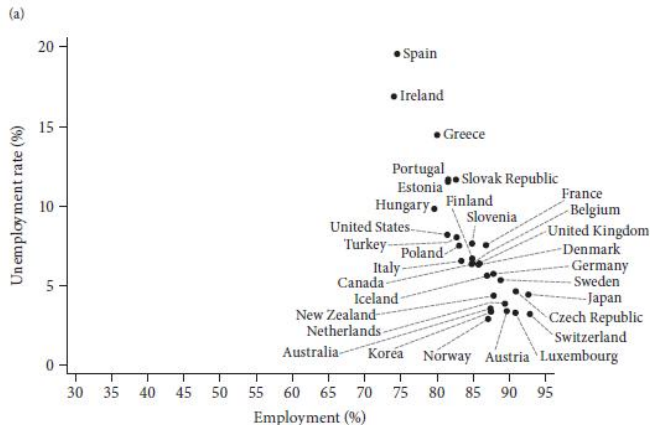
- Unemployed, U : people in working age who, during the reference week (or day) were:
 - without either paid or self-employed work,
 - willing to work *and*
 - looking for a job.
- Inactive, O : people in working age neither employed nor unemployed

Normalization rules

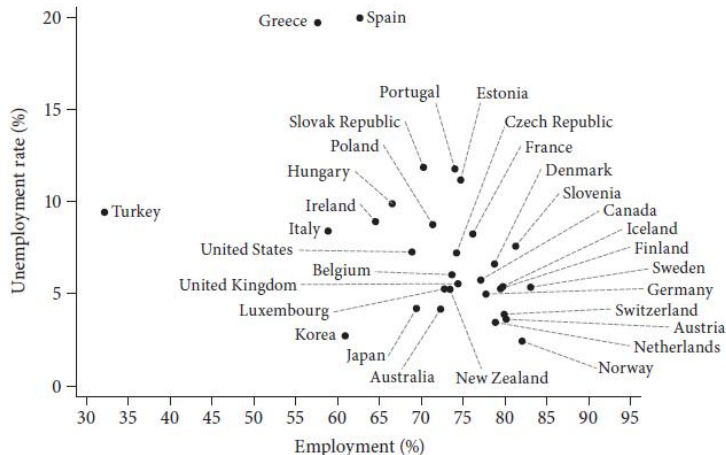
- Labor force (LF): $L + U$
 - Working age population (N): $L + U + O$
 - Unemployment rate: $u = \frac{U}{LF}$
 - Employment rate: $e = \frac{L}{N}$
 - Participation rate: $p = \frac{LF}{N}$
-
- Note: $e = p(1 - u)$

► The porous OLF-U borders

Employment and Unemployment rates Prime Age Males – 2008



Employment and Unemployment rates Prime Age Females – 2008



Theory: key definitions

- The *value of a job*, y , is the value of the labor product obtained when the firm and the worker engage in production.
- The *worker's surplus* or *rent* is the difference between the wage earned by the worker and that worker's *reservation wage*, w^r , that is, the lowest wage at which the worker is willing to accept a job offer. Formally, the worker's surplus is given by $(w - w^r)$.
- The *surplus (or rent) of the firm* is the difference between the value of a job and its costs $(y - w)$.
- The *total surplus* : $(y - w) + (w - w^r) = y - w^r$.

Perfect vs. Imperfect Labour Markets

- A *perfect labor market* is one where there is no total surplus associated to any given job, i.e., it is a market where $y = w$ and $w = w^r$ so that also $y = w^r$,
- An *imperfect labor market* is one where there are rents associated with any given job, so that the total surplus is positive. Wages are, in this context, a rent splitting device.

Labour Market Institutions

- An **institution** is a system of laws, norms or conventions resulting from a **collective choice**, and providing constraints or incentives which alter individual choices over labor and pay.
- A **labor market** is a market where labor services (specified in a vacant job) are sold for a remuneration called wage.
- Institutions create a **wedge** between the value of the marginal job for the firm and the wage.

A framework – generalities

- Labor supply derived from labor-leisure (plus home production) choice
- Aggregation assuming that workers do not choose hours, just participation
- Heterogeneity in reservation wages
- (Derived) labor demand with markups
- Institutions implement a wedge between labor supply and demand

Labor/leisure choice

- Preferences: indifference curves are negatively sloped in c and l (negative MRS), do not intersect (no incoherence) and convex (MRS declining with l)
- MRS = Marginal Rate of Substitution of Income and Leisure:
$$\frac{\frac{\partial U}{\partial l}}{\frac{\partial U}{\partial c}} = \frac{U_l}{U_c}$$
- Budget constraint: $c \leq m + wh$
 - Hourly wage (w) as slope of the budget constraint
 - Maximum hours (l_0) to be allocated to labor (h) and leisure (l)
 - Slope budget constraint: $\left| \frac{dc}{dl} \right|$
 - Maximum utility conditional on constraint: $MRS = \left| \frac{dc}{dl} \right|$

Slope of individual labor supply

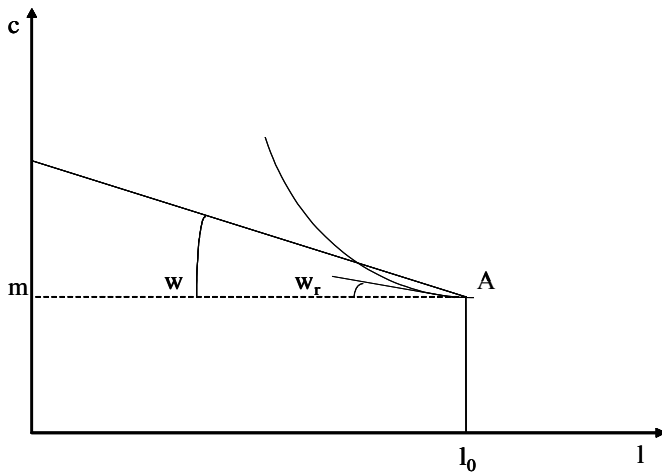
- Depends on relative magnitude of income/substitution effects
- With leisure as normal good, income effect negatively affects labor supply
- Substitution effects always positive on hours worked
- Generally substitution effects dominates for low-wage earners while income effect for high wage earners
- Income effect irrelevant at participation margins

► Income and Substitution effect

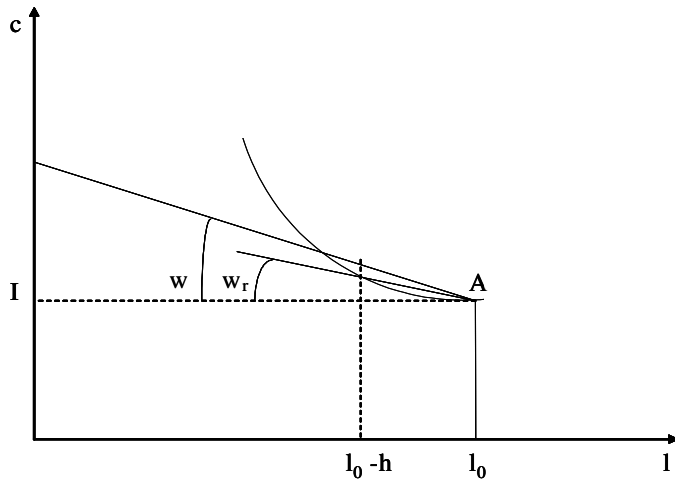
The (static) reservation wage

- It is the lowest wage at which a job-seeker is willing to work (slope of Indifference Curve at l_0 and non-labor income level)
- At that level, elasticity of individual labor supply is always positive – there is only a substitution effect
- Reservation wage is increasing in non-wage income
- Reservation wage separates employment from non-employment

Reservation wage – no hours restrictions



Without and with hours restrictions



From individual to aggregate labor supply

- Heterogeneity in non-wage income or preferences
- Hence heterogeneity in reservation wages w^r
 \Rightarrow density function $g(w^r)$
- Fraction of population participating at wage w :
$$G(w) = \int_0^w g(w^r) dw^r$$
- N = working age population
- If individuals can only offer fixed number of hours of work, then aggregate labor supply = $NG(w)$
- Note: aggregate labor supply is *always* increasing in wage

► Empirical Agg LS for Germany

(Derived) labor demand

- Obtained from profit maximization (including choice of optimal output level) of individual firms
- Optimal employment level: value of marginal product of labor equals the wage
- Decreasing marginal product: labor demand decreasing in wages
- If the firms have some monopoly power in product markets, then the value of the marginal product equals the wage times a markup increasing in the firm market power

With two inputs

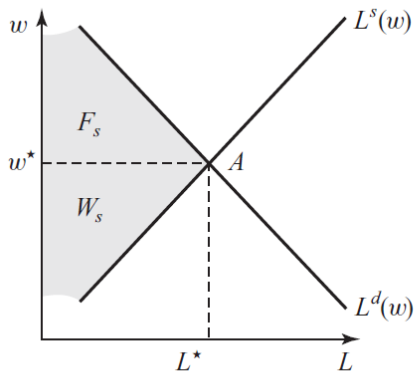
- with two inputs of production (e.g., capital and labor), slope of labor demand also affected by degree of substitutability between capital and labor
- as in the case of labor supply, a wage rise involves a substitution and a scale (analogous to the income) effects
- however in this case the two effects are both negative and reinforce each other

Equilibrium in a perfect labor market

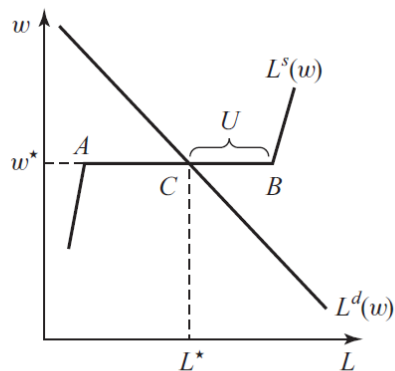
- Aggregate labor demand $\{L^d(w)\}$ is always decreasing in w
- Aggregate labor supply when hours are fixed is fraction of workers with $w^r \leq w$
- Labor supply $\{L^s(w)\}$ is also increasing in wages
- Due to monotonicity of the two functions, there can be only one equilibrium
- The latter is defined by the condition $\{L^d(w)\} = \{L^s(w)\}$

Graphically

(a) Firms' and workers' surplus



(b) A flat segment of labor supply



Equilibrium in a competitive labor market

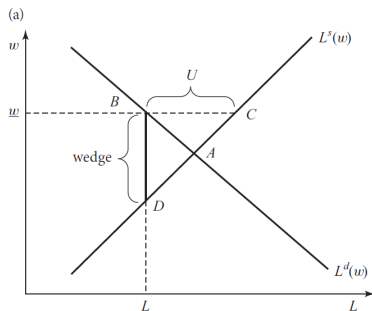
Why Institutions?

- ① *Efficiency*: a competitive labor market doesn't exist
- ② *Equity*: as no lump-sum transfer is available, redistribution is distortionary
- ③ *Policy failure*: heterogeneity and powerful minority interest groups

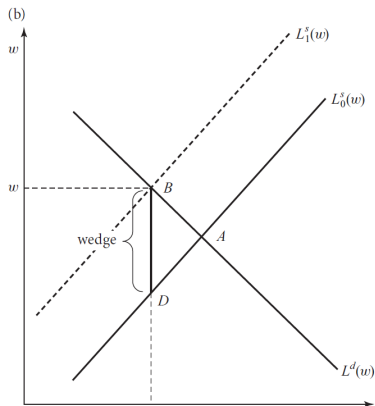
Labor market institutions

- ① Acting on prices:
 - Minimum wage
 - Taxes on labor
 - Trade unions affecting wages
 - Unemployment benefits
- ② Acting on quantities
 - Regulations of working hours
 - Immigration policies
 - Compulsory schooling age
 - Employment protection legislation

Institutions and wedges



(a) Price-based and (b) quantity-based institutions and the wedge



Increasing employment bias of LM institutions?

- In the 1950s and 1960s US enviously looking at European institutions. In the 1980s and 1990s the other way round.
- Interactions between shocks and institutions (e.g., shocks create U, EPL or UBs make it long-lasting)
- Under stronger competitive pressures, LM institutions may have higher costs in terms of foregone employment
- Under financial crises however high leverage and low EPL involve very large job loss rates

► Employment Bias

Reforms of Labor Market Institutions

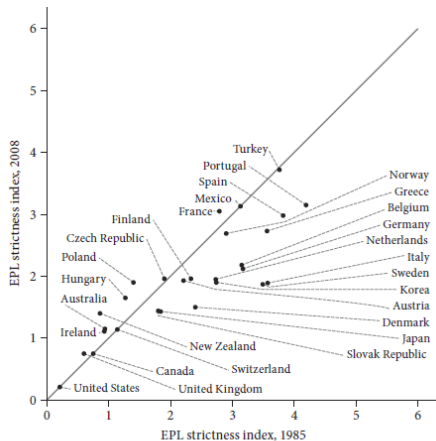


FIGURE 1.8 Evolution of the index of strictness of EPL

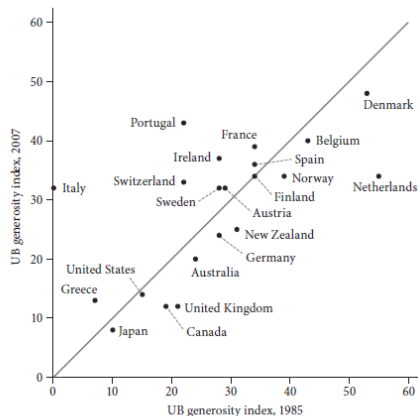


FIGURE 1.9 Evolution of summary generosity measure of UBs

Reforms of Labor Market Institutions

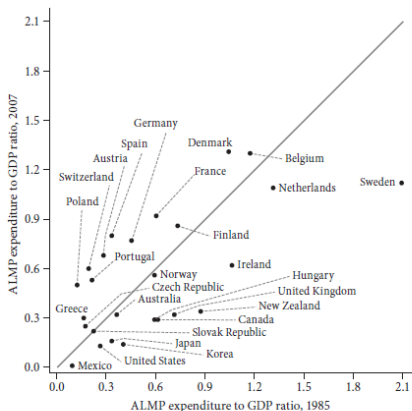


FIGURE 1.10 Evolution of ALMP expenditure to GDP ratio

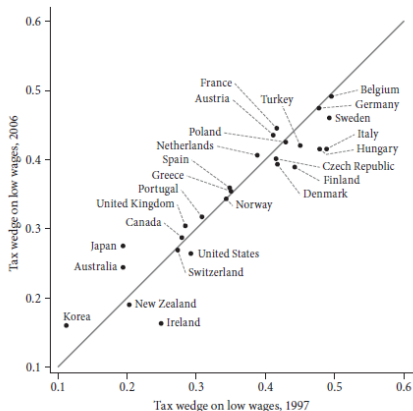


FIGURE 1.11 Evolution of the total tax wedge on low wages

Reforms in Europe 15

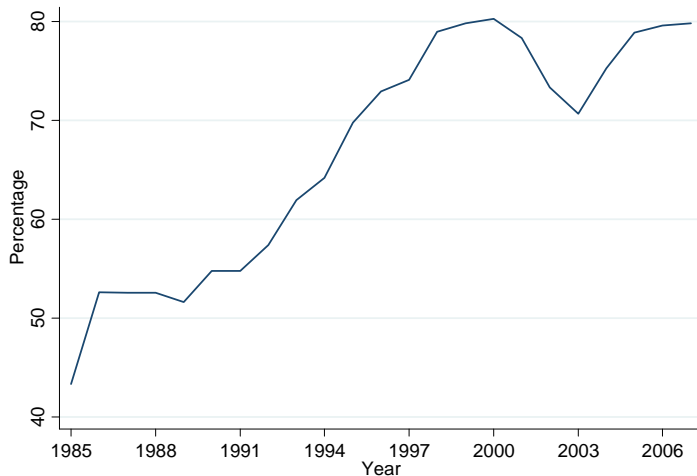
Reforms by institution and direction in the 1980-2007 period.

Reform area	Number	Effect on the wedge (%)		Scope of the reform (%)	
		Decreasing	Increasing	Two-tier	Complete
EPL	199	56	44	52	48
UB	253	55	45	46	54
AP	242	95	5	64	36
ECI	124	91	9	60	40
ER	65	58	42	75	25
Total	883	72	28	56	44

Considering only the 1985-2005 period for Other RET, WT and MIT.

► And in financial and product markets?

Acceleration of reforms decreasing the wedge



Note: 5-year backward weighted moving average

How LM institutions are reformed: a summary

- Many LM reforms
- Sometimes undoing previous reforms: net changes in the values of the indicators conceal a lot of action
- Possible interpretation of inconsistency: political obstacles to reforms (reason nr. 3 for the presence of LM institutions)
- Increasing share of reforms reducing the wedge. Due to globalisation?
- What is going to be happen after the Great Recession?

Exercise:

Mike's preferences over consumption C and leisure l are given by $U(C, l) = Cl$. The hourly wage is 20 euros per hour and there are 168 hours in the week.

- (a) Write down Mike's budget constraint and graph it.
- (b) What is Mike's optimal amount of consumption and leisure?
- (c) What happens to employment and consumption if Mike receives 200 euros of non-labor income each week?

Technical annex.

Competitive equilibrium:

Labor Demand:

$$L^d = \left(\frac{A}{w} \right)^{\frac{1}{\eta}} \quad (1)$$

Where A is a technological parameter and η is the (inverse) labor demand elasticity, $0 \leq \eta \leq 1$.

Labor Supply:

$$L^s = G(w) = w^{\frac{1}{\varepsilon}} \quad (2)$$

Where ε is the (inverse) labor supply elasticity, $\varepsilon > 0$.

Equilibrium in a competitive, wedge-free market is given by $y = w^r = w^*$, hence:

$$L^* = (A)^{\frac{1}{\varepsilon+\eta}}, \quad w^* = A^{\frac{\varepsilon}{\varepsilon+\eta}} \quad (3)$$

Which indeed maximizes the Total Surplus of the Economy, given by the sum of employer's profit and workers' surplus:

$$\max_L \left(\left[\frac{AL^{1-\eta}}{1-\eta} - wL \right] + \left[wL - \frac{1}{\varepsilon+1} L^{\varepsilon+1} \right] \right) \quad (4)$$

The wedge

Equilibrium with a proportional tax on labor income (t).

Government maximizes a Bernoulli-Nash social welfare function:

$$W = \max \left(\left[\frac{AL^{1-\eta}}{1-\eta} - w(1+t)L \right]^{(1-\beta)} \left[w(1+t)L - \frac{1}{\varepsilon+1} L^{\varepsilon+1} \right]^{\beta} \right) \quad (5)$$

where β measures the distribution weight of labor.

Maximizing we obtain that the wedge is zero if and only if

$$\frac{\beta}{1-\beta} = \frac{\varepsilon}{(1+\varepsilon)} \frac{(1-\eta)}{\eta} \quad (6)$$

The disemployment bias

It is given by:

$$1 + t = \frac{(1 - \eta) + \beta(\eta + \varepsilon)}{(1 - \eta)(1 + \varepsilon)} \quad (7)$$

$\mu = 1 + t$ is the markup imposed by institutions over the competitive wage. When the markup is bigger than 1, the employment level is lower than in the competitive equilibrium.

If labor demand becomes more elastic, for example as a result of a globalization shock, at unchanged institutions, the disemployment bias increases.

$$L_2^I = A\mu_0^{-\frac{1}{\varepsilon+\eta_1}} < L_1^I = A\mu_0^{-\frac{1}{\varepsilon+\eta_0}} \quad (8)$$

Where subscripts 0 and 1 indicate the situation before and after the shock respectively.

ADDITIONAL MATERIAL:

the porous OLF-U borders: Problem with OECD-ILO definitions

- Porous participation borders: potential labor force excluded
- Relaxing job search requirement, less inactive (about 15% less inactive in the EU countries)
- Some *discouraged workers* – without work and willing, but not searching because they deem that there are no opportunities for them – are undistinguishable from the unemployed in terms of labor market transitions

◀ Normalization Rules

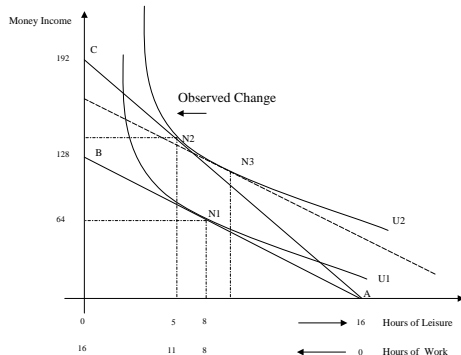
The porous OLF-U borders: OECD-ILO definitions

Country	Empl.	Unempl.	Out of the labor force			
			Total	Potential	Discouraged	Unattached
Denmark	74.1	4.9	21.0	3.4	0.4	17.2
France	60.6	7.0	32.4	1.7	0.1	30.6
Germany	64.5	5.7	29.8	1.3	0.2	28.3
Italy	51.8	8.6	39.7	2.8	0.5	36.4
Netherlands	67.8	3.9	28.3	1.1	0.1	27.1
Spain	48.3	12.4	39.4	1.7	0.3	37.4
United Kingdom	68.8	7.4	23.8	1.2	0.3	22.3

Measures based on OECD-ILO definitions

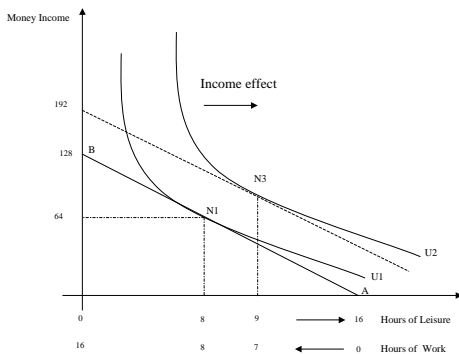
◀ Normalization Rules

Income and Substitution effect: Total effect of a wage rise



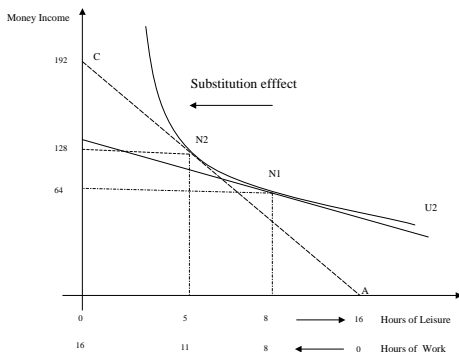
◀ Slope of individual labor supply

Income and Substitution effect: The Income Effect



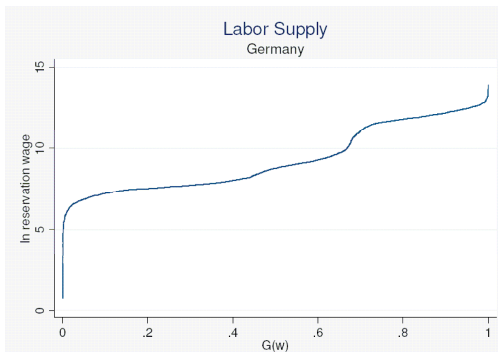
◀ Slope of individual labor supply

Income and Substitution effect: The Substitution Effect



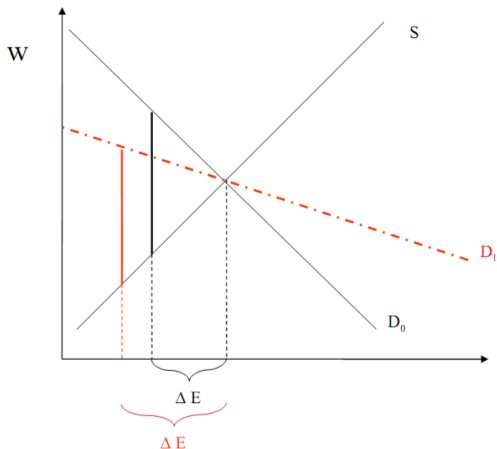
◀ Slope of individual labor supply

Empirically estimated agg LS for Germany



Employment Bias

More competition in product markets (globalisation) increases the employment costs of institutions



◀ Increasing employment bias of LM institutions?

Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Labor Market vs. Financial and Product Market Reforms

Product Mkt	Decreasing the wedge	Increasing the wedge	Total	Of which decreasing
Discrete	31	0	31	100%
Incremental	8	14	22	36%
Total	39	14	53	74%
Of which discrete	79%	0%	58%	
Financial Mkt				
Discrete	52	0	52	100%
Incremental	42	0	42	100%
Total	94	0	94	100%
Of which discrete	55%	0%	55%	
Labor Mkt				
Discrete	16	12	28	57%
Incremental	23	18	41	56%
Total	39	30	69	57%
Of which discrete	41%	40%	41%	

Labor Economics

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Chapter 2. Minimum Wages

Minimum Wages: What are We Talking About?

- Unlike other institutions, MW acts on minima. It sets a wage floor.
- The first minimum wage was introduced in the United States in 1938 and paid 25 cents per hour. In 2007 the federal minimum wage was \$5.85, in nominal terms 23 times larger, but, in real terms, only 1.4 times larger than 70 years ago.

- **Types of minimum wages:**

- ① National, government-legislated (possible consultation with trade unions and employers associations).
- ② National, outcome of collective bargaining agreements and extended to all workers.
- ③ Industry-level minimum resulting from industry-level collective bargaining and extended to all workers in that industry.

Within-country variation

- 1 Not easy to collect info - not always a unique minimum wage
- 2 Cross-industry when set at the industry level - cross regional when large differences in cost-of-living
- 3 Age dependent: different minimum for **youngsters**
- 4 Some countries: acknowledging on the job training, returns to experience & family status

Measures

- Ratio of the Minimum Wage to the Median (or average) Wage
- Coverage of the minimum wage: share of workers occupying jobs eligible for the MW
- Kaitz Index: minimum wage as a proportion of the average wage adjusted by the industry-level coverage of the MW
- Fraction affected: workers with a wage between the old and the new minimum wage
- Spike at the minimum wage (share of workers paid exactly the minimum wage)

Minimum wages in OECD countries (2010)

TABLE 2.1 Minimum wages in OECD countries

	Ratio MW to median wage (%)			Monthly MW, 2010 (euros) (4)	Taxonomy		Percentage earning MW (2005) (7)	Youth subminimum (8)
	1990 (1)	2010 (2)	Difference (3)		System ^a (5)	Type ^b (6)		
Australia	63	54	-9	1,670	N-S	1	—	Yes
Belgium	56	52	-4	1,388	N	2	—	Yes
Canada	38	44	6	1,187	P	1	—	Limited
Czech Republic	—	35	—	311	N	1	2.0	Yes
Denmark	—	—	—	—	S	3	—	Yes
Estonia	—	41	—	278	N	1	4.8	No
France	52	60	8	1,344	N	1	16.8	Limited
Germany	—	—	0	—	S	3	—	Some
Greece	57	49	-8	863	N	2	—	No
Hungary	44	47	3	257	N	1	8.0	No
Ireland	—	52	—	1,462	N	1	3.3	Yes
Italy	—	—	—	—	S	3	—	Some
Japan	30	37	7	1,069	R	1	—	Limited
Korea	30	41	11	605	N	1	—	Yes
Luxembourg	37	42	5	1,725	N	1	11.0	Yes
Mexico ^c	31	19	-12	—	R	1	—	No
Netherlands	56	47	-9	1,416	N	1	2.2	Yes
New Zealand	52	59	7	1,196	N	1	—	Yes
Poland	17	45	28	318	N	1	2.9	No
Portugal	53	56	3	554	N	1	4.7	No
Slovak Republic	—	46	—	308	N	1	1.7	Yes
Slovenia	—	58	—	734	N	1	2.8	No
Spain	47	44	-3	739	N	1	0.8	No
Sweden	—	—	—	—	S	3	—	Yes
Turkey	46	67	21	—	N	1	—	Yes
United Kingdom	—	46	—	1,169	N	1	1.8	Yes
United States	36	39	3	949	N-S	1	1.3	Limited

Sources: Dolton and Bondibene (2011); OECD Minimum Wage Database.

Note: MW = minimum wage; — = not available.

a. System: N = national; N-S = national-state; S = sectoral collective agreement; R = regional; P = provincial.

b. Type: 1 = national, government legislated; 2 = national, bargaining; 3 = industry level, bargaining (see main text).

c. The ratio of MW to median wage is for 2005 instead of 2010.

Evolutions

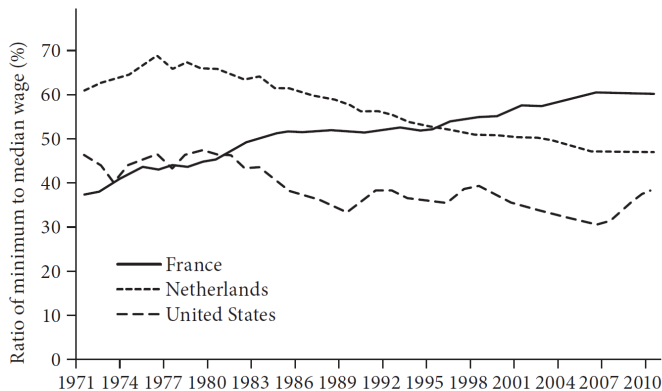


FIGURE 2.1 Ratio of minimum to median wage, 1971–2010

Source: OECD minimum wage database.

Problems with these Measures

- *Spillover effects*: Increase of the minimum wage may raise the average wage leaving the MW/AveWa ratio unchanged. Also increase of MW may reduce wages in the uncovered segment (absorbing more low-skill workers)
- Gross measure, but taxation is progressive
- Earnings should not include bonuses and overtime premiums (measurement issue)

A Competitive Labor Market

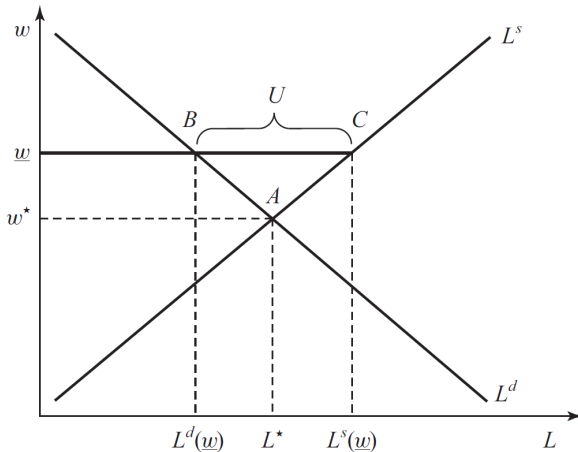


FIGURE 2.2 The minimum wage in a competitive labor market

Pure monopsonist

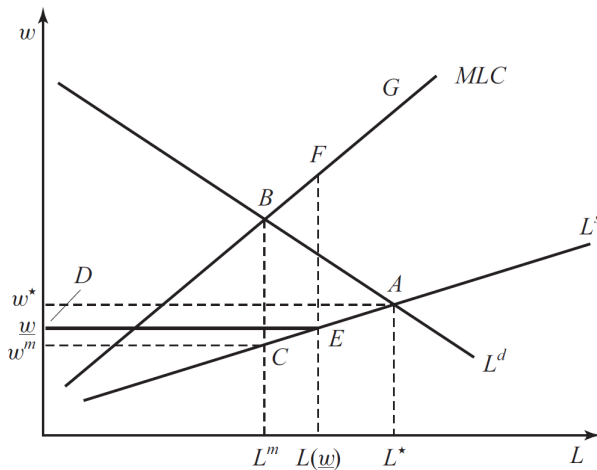


FIGURE 2.3 Monopsony and the minimum wage

Market power – monopsony

- Classical example: mining company in remote area
- Another example: couple of which the spouse is a “tied stayer”
- More frequent collusion among employers (but then also workers: collective bargaining)
- Modern monopsony: many employers, but few vacancies to apply for
- Wage posting: a higher wage attracts more applicants

► The degree of Monopsony Power

MW may increase productivity

- Supply side: productivity of a worker depends on the investment in human capital.
- A minimum wage induces workers to acquire education in order not to be crowded out.
- Similar effect may arise on the demand side: minimum wage increases the number of vacancies for high-productivity jobs issued by employers.

Dual Labor Markets

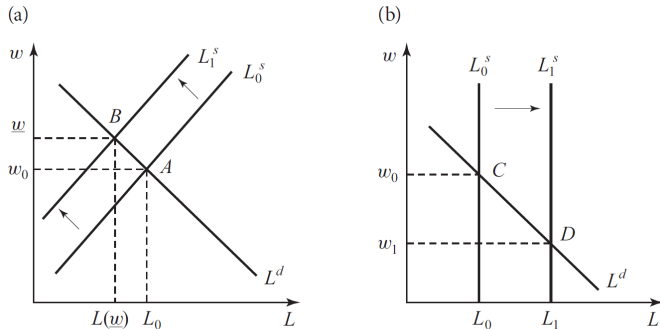


FIGURE 2.4 A dual labor market and the minimum wage: (a) formal sector; (b) informal sector

► The Lighthouse Effect

Large literature

- Dolado and Teuling (1996) cross-country study: negative effects on youth employment
- More recent studies look at the entire wage distribution and use matched employer-employee data
- Autor et al. (2009) effects just above the minimum wage
- Pisschke et al. (2006): effects also at the very top. managerial positions less paid to make room for MINWA
- This suggests that there may be identification problem in taking top earners as controls
- In addition to selection: workers affected are not representative of the entire population

A controversial study: Card & Krueger (1994)

“Natural experiment”

- Impact of increases in the minimum wage in New Jersey (treatment group) in April 1992 from \$4.25 to \$5.05: increase by 80 dollar-cents.
- Control group: Pennsylvania, where the minimum wage remained at \$4.25 throughout this period.
- New Jersey and Pennsylvania are bordering states with similar economic structures
- Data on employment in 410 fast-foods in the two states in March 1992 (before the MW hike) and in December (after).

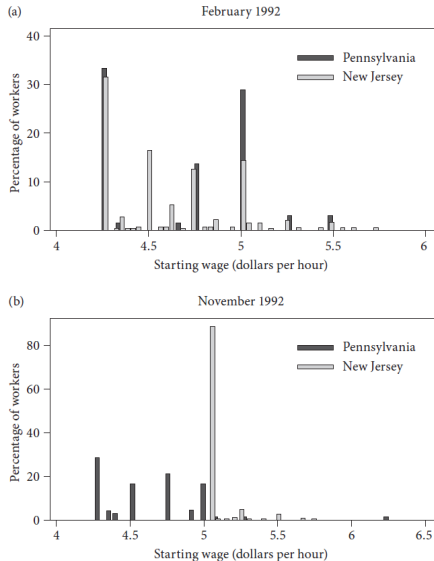


FIGURE 2.5 The wage distribution (a) before and (b) after an increase in the minimum wage

Employment effects – a simple approach

Number of full-time equivalents working in a full-time restaurant:

	Employment	
	New Jersey	Pennsylvania
March 1992	20.4	23.3
December 1992	21.0	21.2
Difference	+0.6	-2.1
Difference-in-differences	2.7	

► Dif-in-dif Estimators

Monopsony effects – what about prices?

Price of a full meal in \$:

	Price	
	New Jersey	Pennsylvania
March 1992	3.35	3.04
December 1992	3.41	3.03
Difference	0.06	-0.07
Difference-in-differences	0.07	

Effects on profitability

	Low (average wage)		Profit margin	
	Low-wage firm	Nonlow-wage firm	Low-wage firm	Nonlow-wage firm
Pre-NMW	2.149	2.775	0.128	0.070
Post-NMW	2.378	2.893	0.089	0.058
Difference	0.229	0.118	-0.039	-0.012
Difference-in-differences	0.111		-0.027	

Note: NMW = national minimum wage; Profit margin = ratio of profits to sales.

Other studies

- Another “natural experiment”
 - Effect of the introduction of a MW in the UK April 1999
 - Comparison of employment outcomes of individuals just **below** the MW and higher up the wage distribution (1st difference) before and after (2nd difference) the introduction of the minimum wage.
 - No adverse effects (adult and youth, men and women)
- Other studies: generally negative effects on employment, notably among youngsters.

Studies based on workers histories

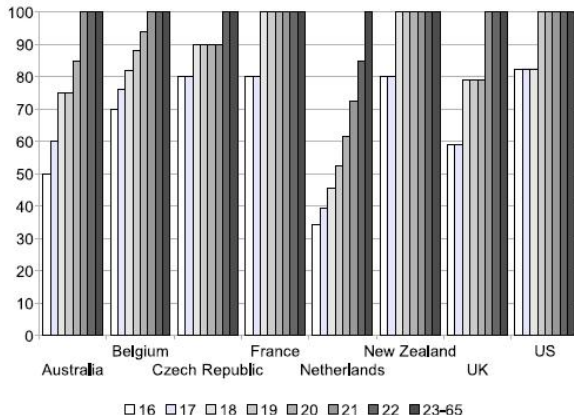
- Since the late 1990s, work combining data on workers and firms (matched employee-employer micro data)
- Focus on the economy as a whole and on the effects on employment and hours
- Increase in MW by 1% in France reduces probability of men (women) keeping a job at the MW by 1% (1.3%)
- Increase by 50% of MW in Portugal reduced hirings but increased job retention

Policy issues

- Should the minimum wage be reduced or increased?
- Should there be a youth minimum wage?

Should there be a youth minimum wage?

Youth Minimum Wage as a percentage of the adult minimum wage by age



Unemployment Rates of Prime Age Workers and Young Workers (2010)

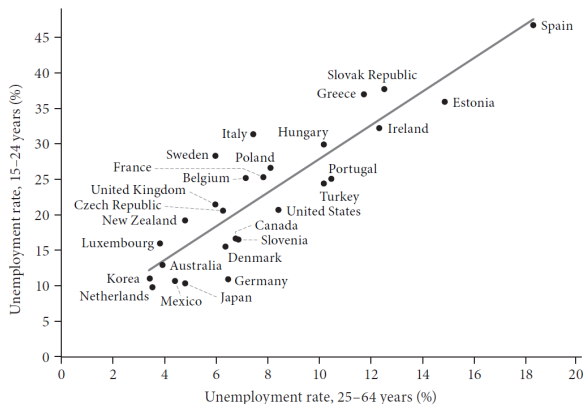


FIGURE 2.7 Unemployment rates of prime-aged workers and young workers, 2010

Source: OECD (2011b).

Hyslop and Stinman (2007): New Zealand

	Minimum wage (percentage of adult wage)		
	Treatment group		Control group
	Aged 16–17	Aged 18–19	
Before March 5, 2001	60	60	100
From March 5, 2001	70	100	100
From March 18, 2002	80	100	100
Increase 2000–2003 (%)	50	87	13

Effects on youth Employment

Indicator	Treatment group		Control group Aged 20–25
	Aged 16–17	Aged 18–19	
Employment rate (%)			
Before	41.3	53.8	64.0
After	43.2	56.2	65.4
Difference	1.9	2.4	1.4
Difference-in-differences	0.5	1.0	
Weekly working hours			
Before	16.4	27.4	34.8
After	19.0	28.2	33.8
Difference	2.4	0.8	−1.0
Difference-in-differences	3.4	1.8	

Why Does a MW exist?

- 1 Efficiency: remedies market failures, e.g. deriving from excessive monopsonistic power
- 2 Equity: reduces earnings inequality by supporting incomes of low-earning, workers, for example, low-skilled workers.

Review Questions

- 1 Why are there so few workers earning the minimum wage?
- 2 Why are minimum wages age dependent?
- 3 When does a minimum wage increase employment?
- 4 When does a minimum wage increase welfare, although not necessarily employment?
- 5 How does a minimum wage affect poverty?

Exercise:

Suppose that w is the wage and L is employment. The supply curve of low wage workers is given by $w = 10 + 2L$. The demand curve is given by $w = 70 - 2L$.

- (a) What are the equilibrium levels of wage, employment, and unemployment?
- (b) What happens to employment and unemployment if a minimum wage of 40 euros is introduced?
- (c) What happens to employment and unemployment if a minimum wage of 60 euros is introduced?

Minimum Wage and Monopsony

The pure monopsonist chooses the employment level that maximizes profits:

$$\pi^m = \frac{AL^{1-\eta}}{1-\eta} - wL, \quad (1)$$

subject to being on the labor supply curve $w = L^\varepsilon$, Therefore

$\pi^m = \frac{AL^{1-\eta}}{1-\eta} - L^{1+\varepsilon}$. Deriving the first-order condition and substituting:

$$L^m = \left[\frac{A}{1+\varepsilon} \right]^{\frac{1}{\varepsilon+\eta}} < A^{\frac{1}{\varepsilon+\eta}} = L^* \quad (2)$$

and

$$w^m = \left[\frac{A}{1+\varepsilon} \right]^{\frac{\varepsilon}{\varepsilon+\eta}} < A^{\frac{\varepsilon}{\varepsilon+\eta}} = w^*; \quad (3)$$

Bargaining or Government Setting?

With **bargaining** the socially optimal wage will deviate by a mark-up factor ($\mu = 1 + t$), where t is the wedge between L^s and L^d , that is a function of labor demand and supply elasticities, as well as distributional weights of employers and workers:

$$\mu = \frac{(1 - \eta) + \beta(\eta + \varepsilon)}{(1 - \eta)(1 + \varepsilon)} \quad (4)$$

Government legislation: the outcome depends on the weights the government attaches to workers and employers. Assume that the Government maximizes a Nash-Bernoulli social welfare function line, the mark-up imposed by the Government over the reservation wage is:

$$\mu^G = \frac{(1 - \eta) + \beta^G(\eta + \varepsilon)}{(1 - \eta)(1 + \varepsilon)} \quad (5)$$

where β^G represents the distribution weight that the government attaches to wage-earners and $1 - \beta^G$ is a measure of the electoral power of employers and profit-earners .

Efficiency Wages

The profits of the firm are equal to

$$\pi = f(e(w)L) - wL$$

The firm has two degrees of freedom, wage and employment, so there are two first-order conditions:

$$\frac{\partial \pi}{\partial L} = 0 \rightarrow f' e(w) - w = 0 \rightarrow f' e(w) = \frac{w}{e(w)} \quad (6)$$

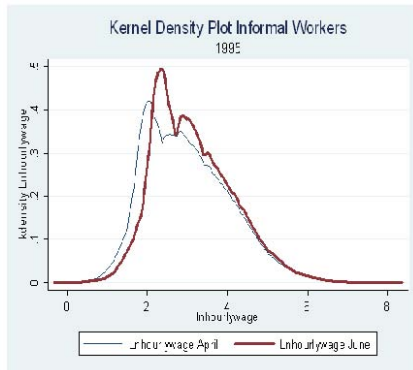
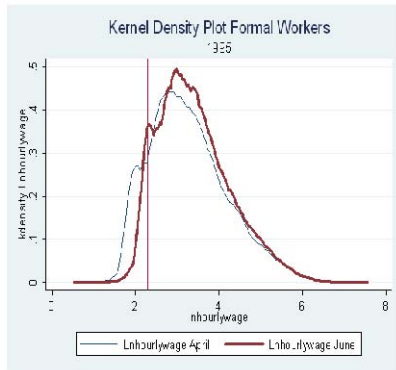
$$\frac{\partial \pi}{\partial w} = 0 \rightarrow f' e(w)L - L = 0 \rightarrow f' e(w) = \frac{\partial w}{\partial e(w)} \quad (7)$$

Combining these two first-order conditions we find that

$$\frac{\frac{\partial e(w)}{e(w)}}{\frac{\partial w}{w}} = 1 \text{ “Solow condition”} \quad (8)$$

ADDITIONAL MATERIAL:

The Lighthouse Effect



◀ Dual Labor Markets

Difference-in-Differences estimators

- If the employment L in state i is determined by an equation of this type:

$$L_i = \alpha \underline{w}_i + X_i \gamma$$

where \underline{w}_i is the level of the minimum wage and X_i contains all the other variables which influence L_i .

- If we have two observations which refer to two dates for the same State, so:

$$\Delta L_i = L_{i2} - L_{i1} = \alpha(\underline{w}_{i2} - \underline{w}_{i1}) + (X_{i2} - X_{i1})\gamma$$

Difference-in-Differences estimators (2)

- If we also have data for another state j which is identical to i in each characteristic except for w , which is not changed, so:

$$\Delta L_j = (X_{j2} - X_{j1})\gamma$$

then:

$$\Delta L_i - \Delta L_j = \alpha(\underline{w}_{i2} - \underline{w}_{j1})$$

- In our case, if we think that New Jersey and Pennsylvania are similar enough, we can obtain an estimation of α by simply calculating the difference of the difference.

Diff-Diff estimation: results

- $\Delta L_{NJ} - \Delta L_{PA} = 0.29 - (-2.01) = 2.30$
- $\frac{(\Delta L_{NJ} - \Delta L_{PA})}{\Delta \underline{w}_{NJ}} = \frac{2.30}{0.8} = 2.875$
- An increase of the minimum wage leads to an increase of the number of employees.
 \Rightarrow An increase of \underline{w}_i of \$1 creates 2.875 more employees per fastfood restaurant.

◀ Card and Krueger(1994)

The degree of monopsony power

Let $y(L)$ be the value of the marginal product of labor and $L^S = G(w)$ the aggregate labor supply. Total labor costs C are wL . For marginal labor costs $\frac{dC}{dL} = w + \frac{dw}{dL}L = w(1 + \frac{dw}{w} \frac{L}{dL})$ so marginal labor costs $\frac{dC}{dL} = w(1 + \varepsilon)$, where ε is the inverse elasticity of labor supply. At the monopsony equilibrium:

$$y(L^m) = w^m(1 + \varepsilon), \quad (9)$$

The wedge measures the degree of monopsonistic power of the firm.

$$\frac{y(L^m) - w^m}{w^m} = \varepsilon, \quad (10)$$

is decreasing with the wage elasticity of labor supply: when labor supply is infinitely elastic, ε tends to zero and hence monopsonistic power is zero. [◀ Monopsony](#)

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

September 2013

Tito Boeri and Jan van Ours (2013)
The Economics of Imperfect Labor Markets
Princeton University Press

Chapter 3. Unions and Collective Bargaining

Unions: What are we Talking About?

- Unions typically bargain over all aspects of an employment contract: wages, working hours, overtime pay, fringe benefits, employment security, and health and safety standards.
- Voluntary membership organizations: workers will only join a union if it is profitable to do so.
- First unions in the UK (18th Century) as craft organizations providing mutual insurance to their members; later, in the 19th century, industrial unions representing workers in semiskilled positions; since the beginning of the 20th century national organizations with political role.
- Involved in collective bargaining with employers.

Union density (% of all workers)

	1960	1980	2000	2006	2010
Denmark	57	79	74	69	69
France	20	18	8	8	8
Germany	35	35	25	21	19
Italy	25	50	35	33	35
Netherlands	42	35	23	20	19
Spain	–	–	17	15	16
UK	40	51	30	28	33
US	31	22	13	12	13

Union membership in four OECD countries

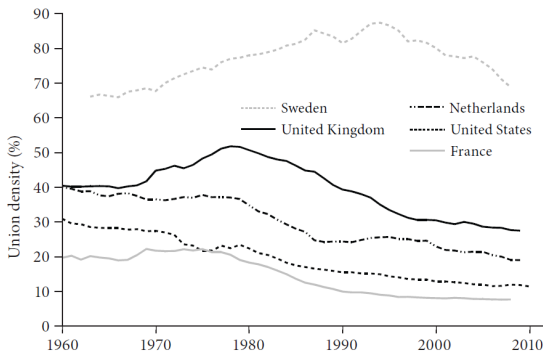


FIGURE 3.1 Union membership in five countries, 1960–2010

Source: Visser (2011).

Note: For details see table 3.1.

Unions – presence and influence

- Union density (only active members?)
- Coverage of collective bargaining
- Dichotomy between unions' influence and presence: “excess coverage”
- Centralization of bargaining (formal level)
- Coordination of unions (informal level – implicit)
- Wage share
- Strikes

Measures of union power – (often) 2010

	Coverage	Union density	Excess coverage	Level of bargaining	Coordination
Denmark	80	69	11	2	3
France	90	8	82	2	2
Germany	62	19	43	3	4
Italy	80	35	45	2	4
Netherlands	82	19	63	2	4
Spain	85	16	69	3	4
United Kingdom	33	28	5	1	1
United States	13	11	2	1	1

Coverage= Employees covered by wage bargaining agreements (%)

Union Density= Union members in the active, dependent and employed labor force (%).

Level of Bargaining = the dominant level(s) at which wage bargaining takes place:

5 = National or central level – 1 = local or company bargaining.

Coordination of wage bargaining:

5 = Economy-wide bargaining – 1 = fragmented bargaining, mostly at company level.

Coordination and Union Density

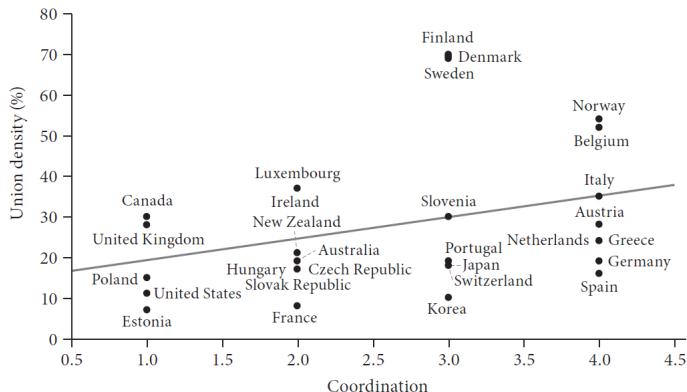


FIGURE 3.2 Coordination and union density, 2010

Source: Visser (2011).

Note: See definitions of coordination and union density in table 3.1.

Strike activity – 2000-2004

	Strike rate	Average duration	Incidence of workers involved	Intensity of work stoppages
Denmark	39.4	1.3	27.9	37.6
France	101.0	-	-	5.9
Germany	3.5	1.4	4.0	-
Italy	140.3	1.0	157.4	4.9
Netherlands	10.7	2.5	5.5	0.2
Spain	234.2	2.7	138.5	5.3
UK	28.7	2.7	13.4	0.6
US	46.8	24.5	1.4	0.0

- Strike rate = number of work days lost per 1000 workers.
- Average duration = average work days lost per worker involved.
- Incidence = number of salaried workers involved in strikes or affected by lock-outs of workplaces per 1000 workers.
- Intensity = number of work stoppages per 100,000 workers.

Union membership & free-rider problem

- Membership decision: Cost-benefit analysis.
- Join if costs of membership (fees, time) are smaller than benefits (wages, security).
- Under excess coverage, free-rider problem: why should workers pay union dues if they are covered in any event?
- How unions solve their free rider problem:
 - Externalities – reputation for “good societal values”.
 - Provision of exclusive services to members: on-the-job training, retirement and tax counseling.

Union bargaining

- Most theories of union behavior take membership as given and concentrate on collective bargaining.
- The latter is modeled in three different ways:
 - Monopoly unions
 - Right-to-manage
 - Efficient bargaining

Right-to-manage model

- Union and firms bargain over any surplus.
- Nash-bargaining: max of product of surplus of workers and firms weighted by respective bargaining strengths (β and $(1 - \beta)$).
Gains as surplus over fall back option (no-agreement outcome).
- For the firm, the fall-back option is zero.
- For the union member it is the reservation wage, w^r .
- Bargaining is on the wage
- Employment = on the demand curve

“Right to manage” outcomes

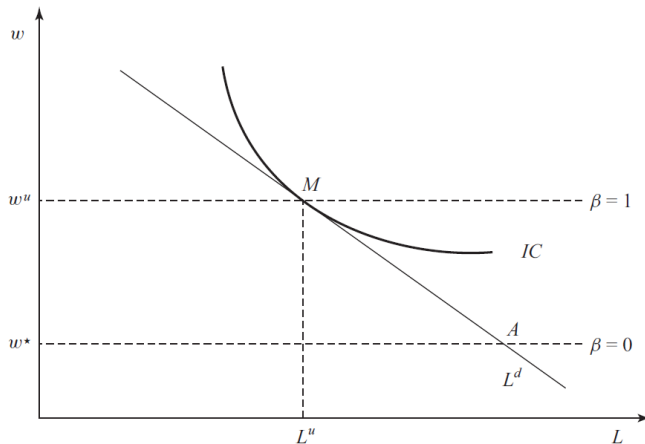


FIGURE 3.3 Right-to-manage outcomes and the bargaining power of unions

Monopoly union model

- Special case of right-to-manage: all bargaining power on workers
- The unique union is the sole “seller” of labor
- Union sets wages unilaterally maximizing the expected utility of a representative worker (median member) subject to the labor demand of the firm.
- The firm reads off the employment level corresponding to w .
- No bargaining takes place. Decision applies to all workers (“closed shop”).

Efficient bargaining: over wage **and** employment

- Firms: highest iso-profit curves
- Unions: highest utility curve
- Bargaining only over wage generates non-efficient outcome
- Bargaining over wage **and** employment: efficient outcome

Efficient bargaining: Labor demand & isoprofits

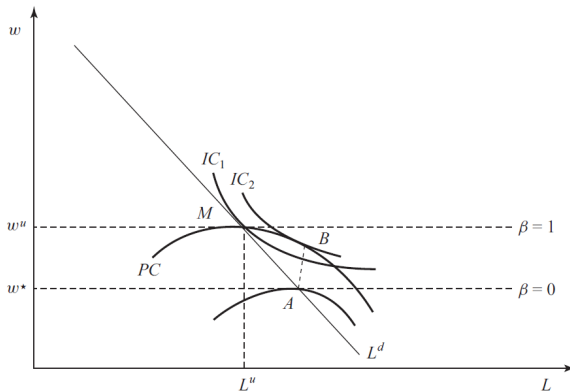


FIGURE 3.4 Efficient bargaining outcomes

► Efficient bargaining: Isoprofit curves & Union utility curves

Endogenous union membership

- Decision to join a union: depends on policies of unions.
- Generally sponsor egalitarian wage policies: high-skilled workers no incentive to join unions.
- High wage demands: low-skilled workers are crowded out of their jobs.
- More successful in recruiting among medium-skilled workers.
- Under excess coverage, free-rider problem: why should workers pay union dues if they are covered in any event?

The free-rider problem

- Membership decision: Cost-benefit analysis.
- I join if costs of membership (fees, time) are smaller than benefits (wages, security).
- How unions solve their free rider problem:
 - Externalities – reputation for “good societal values”.
 - Provision of exclusive services to members: on-the-job training, retirement and tax counseling.

The Hold-up problem

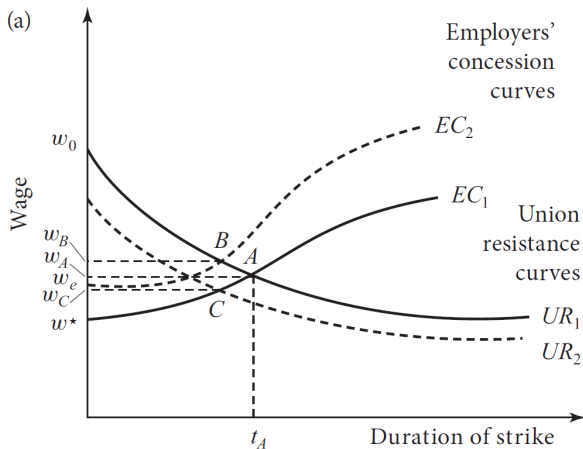
When capital is sunk, bargaining over quasi-rents can divert returns to investment to workers causing under-investment. Unless workers can commit to accept wages agreed before the investment is carried out.

- Unionized firms invest less than non-unionized firms.
- Problem also of truce after an agreement is reached.
- Union pluralism: case of Pomigliano.
- Problem of unions: low investment leads to de-unionisation (Hirsh, 2004).

Strikes

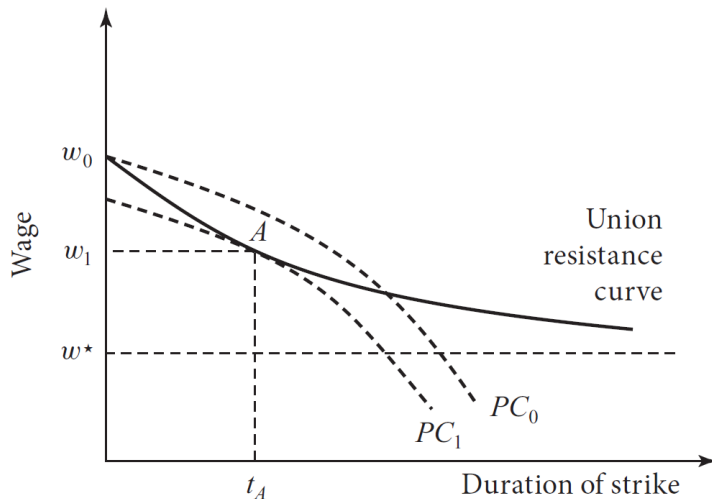
- A strike may occur if employers and unions do not reach an agreement
- Strikes are costly, they shrink the surplus over which bargaining occurs
- When perfect information it is **irrational** to strike
- “Hicks paradox”: both parties would be better off without a strike
- Strike due to imperfect information about firms’ financial situation

Hicks Paradox



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Duration of a strike-firm maximizing profit



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Effects of unions on wages

- “Union wage gap”: estimated via regressions of wage equations of the type

$$\ln(w_i) = \alpha + \beta_m M_i + X'_i \gamma$$

where

- M_i is a dummy variable denoting membership of a trade union (= 1 when individual is member, 0 otherwise)
- X is a vector of personal characteristics affecting wages (e.g. age, education, tenure).
- Denoting by w^u and w^n mean wages of union and non-union members, estimated union wage gap is β_m

$$\frac{w^u - w^n}{w^n} \approx \ln(w^u) - \ln(w^n) = \beta_m$$

Results

- Union wage gap (β_m) between 3 and 19% in the UK, 12 to 20% in the US.
- In countries with excess coverage, it is meaningless (no counterfactual).
- Problems also in countries with no excess coverage:
 - endogeneity: self-selection into unions in industries with high surplus
 - measurement error: not easy to collect information on pay
 - spillovers: bargaining position of non-union members may improve

► Effects of de-unionization on US wage distribution

Evidence on Rent-Sharing

Study by Card et al. on Regione Veneto data. Longitudinal data on wages and firms financial conditions.

- Problem of endogeneity of profitability: more profitable firms hire best workers. Also efficiency wage effects.
- Identifying assumption: industry demand shocks affect industry level profitability without effects on local labor supply.
- Findings: more profitable employers pay higher wages. Elasticity of wages to quasi-rents in IV: 3-4
- Not much evidence of holdup problem: rent sharing deducts the full cost of capital.
- Consistent with dynamic model in which workers pay upfront portion of rents they will obtain from irreversible investment in the future.

Research on Unemployment and bargaining level

- Macro empirical literature estimating employment and unemployment equations
- It suggests that the level at which bargaining takes place is important
- The macro performance of an economy with high or low degree of *bargaining centralization* is, ceteris paribus, superior to that of an economy with intermediate (e.g., industry level) degree of co-ordination
- Theoretical explanations: trade-off flexibility - internalization of macro-constraints; unions may exploit market power at the industry level manipulating relative prices
- Co-ordination reduces the trade-off between centralization and decentralization
- Serious measurement and endogeneity problems

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Policy Issue: Do Unions Increase Efficiency?

- The good and the bad face of unions.
- Good face: “Exit–voice”: union give workers an option of **voicing** problems, instead of **exiting** the firm when they are unhappy.
- Bad face: Rent extraction – unions stronger in industries with no product market competition.

► Do unions reduce workplace accidents?

Coverage, union density and excess coverage in different industries in the United States (2011)

TABLE 3.3 Coverage, union density and excess coverage in different industries in the United States, 2011

Industry	Coverage (%)	Union density (%)	Employment share (%)
Utilities	28.7	27.5	1.0
Manufacturing	11.3	10.6	10.9
Construction	16.1	15.2	5.3
Transportation	30.5	28.8	4.3
Wholesale and retail trade	5.4	4.8	14.5
Education	37.0	33.3	10.1
Health care and social assistance	10.7	9.5	14.0
Public administration	36.3	32.7	5.4
Other industries	3.9	3.3	34.5
Total	13.0	11.8	100.0

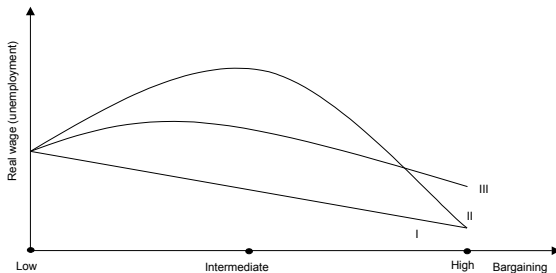
Source: Dataset constructed by Barry Hirsch and David Macpherson; see Hirsch and Macpherson (2003).

Note: Employment = wage and salary employment; union density = percentage of employed workers who are union members; covered = percentage of employed workers who are covered by a collective bargaining agreement.

Policy issue: Should bargaining be decentralized?

- Trade-off between internalization of spillover effects (and bargaining costs) and capacity to adapt to economic shocks.
- High level of bargaining: internalization of spillover effects, “right-to-manage” model – no “efficient” bargaining.
- Low level of bargaining: “efficient” bargaining is possible – performance-related pay
- Also effects on workers incentives, motivations, hence productivity.
- Problem of frequency of bargaining too: staggered contracts.
- Can performance-related pay reduce frequency of bargaining?

A hump-shaped relationship



Notes:

- I. The effect of internalization of negative externalities
- II. Hump-shaped relationship with small foreign trade
- III. Hump-shaped relationship with large foreign trade

Why unions exist?

- Because they are popular among some socioeconomic group.
- The fast aging of the median union member in some countries suggests that unions may be caught in a vicious circle of aging membership and reduced attractiveness among the young and active population. New firms start often without unions.
- The share of retirees among union members is increasing everywhere. This means that unions increasingly favor older people in intergenerational conflicts, for example, in the design of public pensions.
- Unless unions solve this intergenerational problem, they may be heading for the grave.

Review Questions

- 1 What are the pros and cons of the various measures of the strength of labor unions provided by the literature?
- 2 Why are unions stronger in industries where there is less competition in product markets?
- 3 Why is a right-to-manage bargaining system inefficient?
- 4 Why do unions pursue egalitarian wage policies?
- 5 How does competition affect efficient bargaining?

Exercise (I)

Wages in Kumbekistan are set via national agreements, in spite of large within country disparities in economic and labor market performance. In Eastern Kumbekistan labor demand is given by: $L_E^d = 1,000,000 - 20w$ where w is the annual wage, while in Western Kumbekistan is given by $L_W^d = 800,000 - 20w$. Labor supply is the same in each region and there is no interregional mobility of the workforce $L^s = 700,000 + 10w$. Suppose that collective bargaining, involving mainly Eastern workers and employers, impose the wage that clears the market in Eastern Kumbekistan.

Exercise (II)

- (a) What would be the employment and unemployment level in the two regions?
- (b) Suppose that there is a labor supply shock, e.g., brought about by migration to the richest region, and hence labor supply in the East is now $L_E^s = 790,000 + 10w$ and national wage contracts are revised accordingly. What happens to employment and unemployment levels in the two regions?
- (c) Finally suppose that wage setting is decentralized and workers and firms in the West are allowed to set wages clearing the regional labor market. What would be in such case the wage differential between the two regions? And how large should be the flow of workers from the Western to the Eastern regions to bring this wage differential to zero?

How Strong Should Unions Be in Order to Be Efficient (I)

Collective bargaining:

$$w = \arg \max \left(\left[\frac{AL^{1-\eta}}{1-\eta} - wL \right]^{1-\beta} \left[wL - \frac{1}{\varepsilon+1} L^{\varepsilon+1} \right]^\beta \right), \quad (1)$$

Bargaining only over wages, maximization under $L = (w/A)^{-\frac{1}{\eta}}$:

$$w^b = (\mu)^{\frac{\varepsilon}{\varepsilon+\eta}} (A)^{\frac{\varepsilon}{\varepsilon+\eta}} = (\mu)^{\frac{\varepsilon}{\varepsilon+\eta}} w^*, \quad (2)$$

where $\mu \equiv \left(\frac{1-\eta}{1+\varepsilon} + \beta \frac{\eta+\varepsilon}{1+\varepsilon} \right) \frac{1}{1-\eta}$ is the optimal markup imposed by collective bargaining over the opportunity cost of working, the superscript b denotes equilibriums with collective bargaining institutions, and w^* is the wage prevailing at the equilibrium without unions.

How Strong Should Unions Be in Order to Be Efficient (II)

If $\beta = 1 \rightarrow$ monopoly union model:

$$w^b = w^u = \left(\frac{1}{1-\eta} \right)^{\frac{\varepsilon}{\varepsilon+\eta}} (A)^{\frac{\varepsilon}{\varepsilon+\eta}} = \left(\frac{1}{1-\eta} \right)^{\frac{\varepsilon}{\varepsilon+\eta}} w^*. \quad (3)$$

If also $\eta \rightarrow 0$ (aggregate labor demand infinitely elastic):

$$w^u = \left(\frac{1}{1-\eta} \right) w^*. \quad (4)$$

If all bargaining power belongs to employers ($\beta = 0$) and labor demand is infinitely elastic ($\eta \rightarrow 0$):

$$w^b = w^m = \left(\frac{1}{1+\varepsilon} \right) w^* \text{ (Pure monopsony case)}. \quad (5)$$

How Strong Should Unions Be in Order to Be Efficient (III)

If both labor demand and supply are inelastic, competitive eq. can be replicated if:

$$\beta = \frac{\varepsilon}{\varepsilon + \eta} (1 - \eta), 1 - \beta = \frac{\eta}{\varepsilon + \eta} (1 + \varepsilon), \quad (6)$$

because $\mu = 1$.

The eq. is supported by any combination of weights (β and $(1 - \beta)$) such that

$$\frac{1 - \beta}{\beta} = \frac{\eta}{1 - \eta} \frac{1 + \varepsilon}{\varepsilon} \quad (7)$$

Deriving the Contract Curve (I)

$$U^{union} = L^d(w) [u(w) - u(w^r)] \rightarrow MRS^U = -\frac{\partial U / \partial L}{\partial U / \partial w} = -\frac{u(w) - u(w^r)}{L^d(w) u'(w)} \quad (8)$$

$$\pi = R(L^d(w)) - wL^d(w) \rightarrow MRTS^\pi = -\frac{\partial \pi / \partial L}{\partial \pi / \partial w} = \frac{R'(L^d(w)) - w}{L^d(w)} \quad (9)$$

Tangency condition:

$$MRS^U = MRTS^\pi \Rightarrow -\frac{u(w) - u(w^r)}{L^d(w) u'(w)} = \frac{R'(L^d(w)) - w}{L^d(w)} \quad (10)$$

simplifying

$$u(w) - u(w^r) = u'(w) [w - R'(L^d)] \quad (11)$$

Deriving the Contract Curve (II)

Using the implicit function theorem, specifying

$$G : u(w) - u(w^r) - u'(w) [w - R'(L^d)],$$

$$\frac{\partial w}{\partial L} = - \frac{\partial G / \partial L}{\partial G / \partial w} = - \frac{u'(w) R''(L^d)}{-u''(w) [w - R'(L^d)]} = \frac{u'(w) R''(L^d)}{u''(w) [w - R'(L^d)]} \quad (12)$$

The slope of the contract curve specified in 12 depends on the nature of the utility function:

- 1 Unions are risk neutral: $u(.) = w$, therefore $u'(.) = 1$ and $u''(.) = 0$. Then the contract curve is vertical.
- 2 Unions are risk averse: $u'(.) > 0$ and $u''(.) < 0$. Then the slope of the contract curve is positive.
- 3 Unions are risk lovers: $u'(.) > 0$ and $u''(.) > 0$. Then the slope of the contract curve is negative.

ADDITIONAL MATERIAL:

Bargaining over Wages (Right to Manage) (I)

The right-to-manage agreement obtains the wage level that maximizes the Nash product

$$[L^d(w) (w - w^r)]^\beta [R(w) - wL^d(w)]^{(1-\beta)}, \quad (1)$$

where β is the bargaining power of unions.

F.O.C. leads to:

$$\frac{w - w^r}{w} = \frac{\beta}{\frac{\beta}{\eta} + (1 - \beta)\varepsilon_w^\pi}, \quad (2)$$

where η and $\varepsilon_w^\pi = \left| \frac{\partial \pi}{\partial w} \frac{w}{\pi} \right|$ are, respectively, the inverse wage elasticity of labor demand and the elasticity of profits with respect to wages.

◀ "Right to manage" outcomes

Bargaining over Wages (Right to Manage) (II)

$$\frac{w - w^r}{w} = \frac{\beta}{\frac{\beta}{\eta} + (1 - \beta)\varepsilon_w^{\pi}}, \quad (2)$$

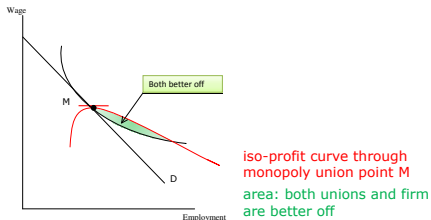
When β tends to zero, the markup goes to zero, indicating that workers are paid their reservation wage, as in the competitive (and the pure monopsony) equilibrium. As β tends to unity (the union has all bargaining power), the markup is simply given by the inverse of the elasticity of labor demand. Then, the wage set by the unions is the monopoly union wage (denoted by the superscript u) and the wage mark-up is equal to

$$\frac{w^u - w^r}{w^u} = \eta \quad (3)$$

The more elastic the labor demand, the lower the markup obtained by the union.

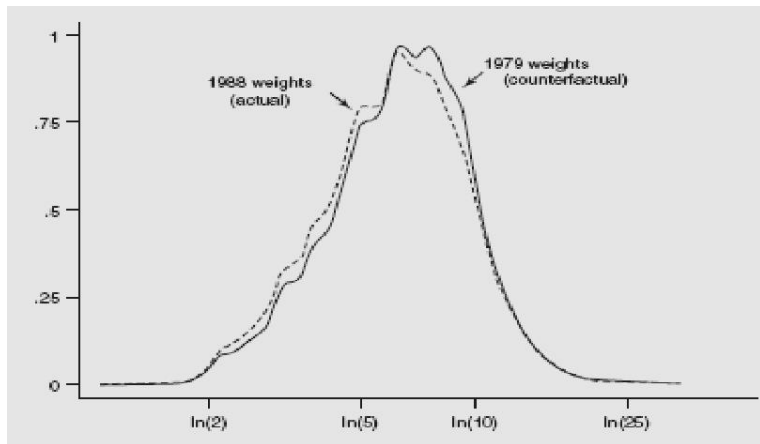
◀ "Right to manage" outcomes

Efficient bargaining: Isoprofit curves & Union utility curves



◀ Efficient bargaining: Labor demand & isoprofits

Effects of de-unionization on US wage distribution

[◀ Results](#)

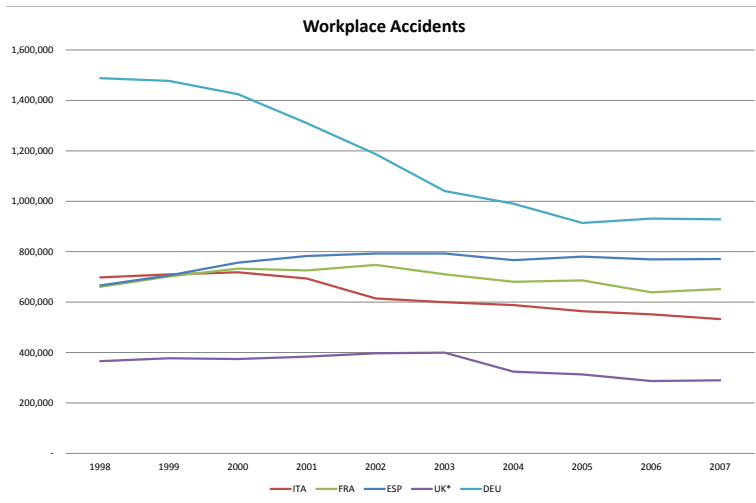
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Do unions reduce workplace accidents?

- (A. S. Litwin, 2000) UK (no excess coverage): unions reduce workplace accidents. Endogeneity issue not dealt with.
- (Bacow, 1980) High heterogeneity in unions behaviour: some unions are more aggressive than others in pursuing health and safety objectives.

◀ Policy Issue: Do Unions Increase Efficiency?

Unions and Workplace Safety



◀ Policy Issue: Do Unions Increase Efficiency?

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

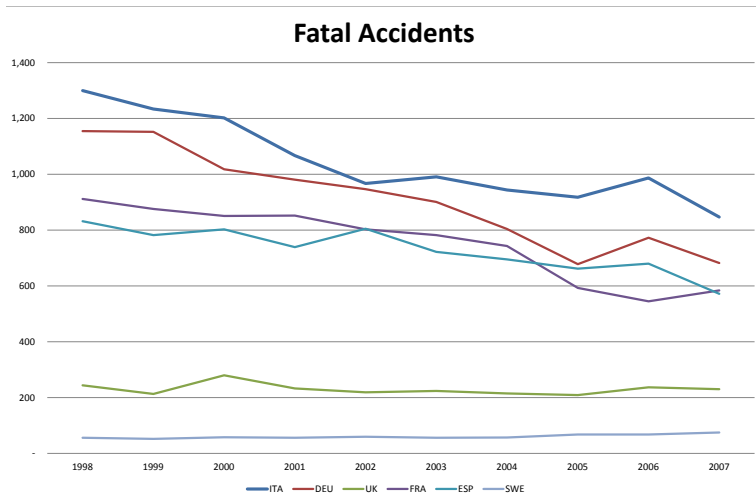
Moral hazard problems

However...

- (J. Boone and J. C. van Ours, 2002) Number of reported workplace accidents is cyclical: low when unemployment is high, as reporting an accident increases worker's probability of being fired. Fluctuations in reported accidents **may not** reflect changes in workplace safety.
- Possible solution: look at **fatal accidents**

◀ Policy Issue: Do Unions Increase Efficiency?

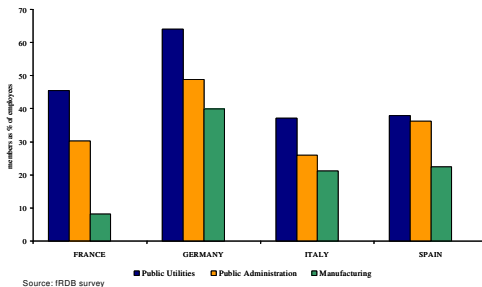
Fatal accidents



◀ Policy Issue: Do Unions Increase Efficiency?

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Unions and Product Market Competition in Europe



◀ Coverage, union density and excess coverage in different industries in the United States(2011)

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

September 2013

Tito Boeri and Jan van Ours (2013)

The Economics of Imperfect Labor Markets

Princeton University Press

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
 - Prison = Prison sentences 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

Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

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.

Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

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.

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

U = utility Π = profit w_f = wage females

L_f = women workers hired. they can be *segregated* in some firms

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

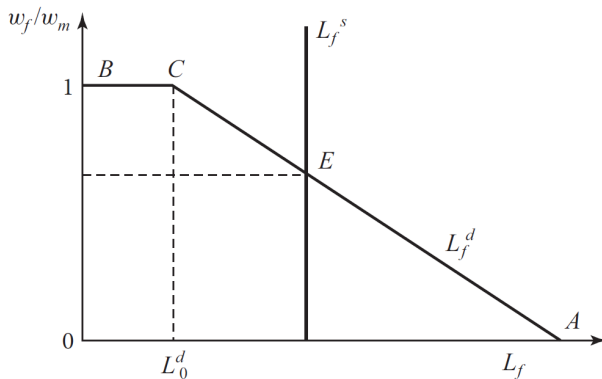


FIGURE 4.1 Employer discrimination and the gender wage gap equilibrium

Discrimination is Inefficient

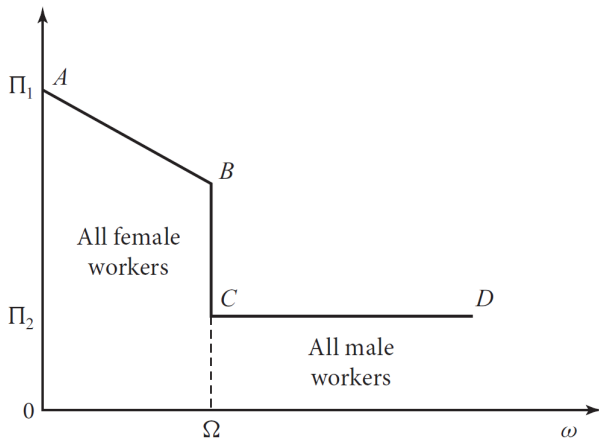


FIGURE 4.2 Profits and coefficient of discrimination

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 prejudiced, increase in the number of unprejudiced firms reduces and may drive to zero wage discrimination.
- ④ If $L_0^d > L_f^s$ there is no wage effect of discrimination.
- ⑤ If $0 < \omega < \Omega$, prejudiced firms only hire women but still have lower profits. Driven away by competition (free entry) in the long-run.
- ⑥ Note: in imperfect labor markets the **average** employer determines discrimination.

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 employers are not prejudiced and all men are prejudiced there will be full segregation and no wage discrimination.

Taste-based discrimination – Customers

$$p_w = p(1 + \omega l_f) \quad (4)$$

p = actual price

ω = coefficient of customer discrimination

Predictions from this model:

- 1 Since firms pay workers according to their marginal product women will have a lower wage.
- 2 Firms will be segregated. For an all-women firm the product price is low so this firm cannot afford to hire a male worker. For an all-men firm the product price is high but this price would fall once a female worker is hired.

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 employees 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, 1993)

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

Imperfect Labor Markets: Monopsony explanation (Robinson, 1993)

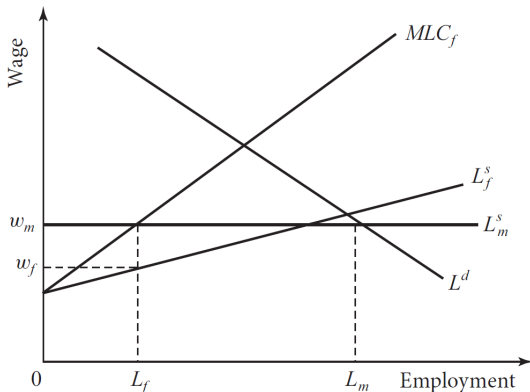


FIGURE 4.3 The gender wage gap in a monopsony model

Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Imperfect Labor Markets: Monopsony explanation (Robinson, 1993)

- 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 (Robinson, 1993)

- 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 not predict perfectly individual productivity
 - q = perceived productivity
 - T = “test” score - true test, experience from the past, interpretation of application letter or c.v.
 - 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

$$q_{ji} = \alpha_j T + (1 - \alpha_j) T_i$$

Statistical discrimination

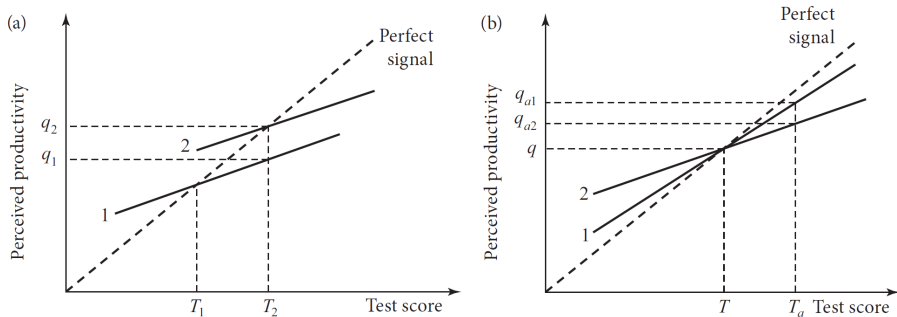


FIGURE 4.4 Statistical discrimination

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 (Sorting as signalling: see Education)

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
- 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

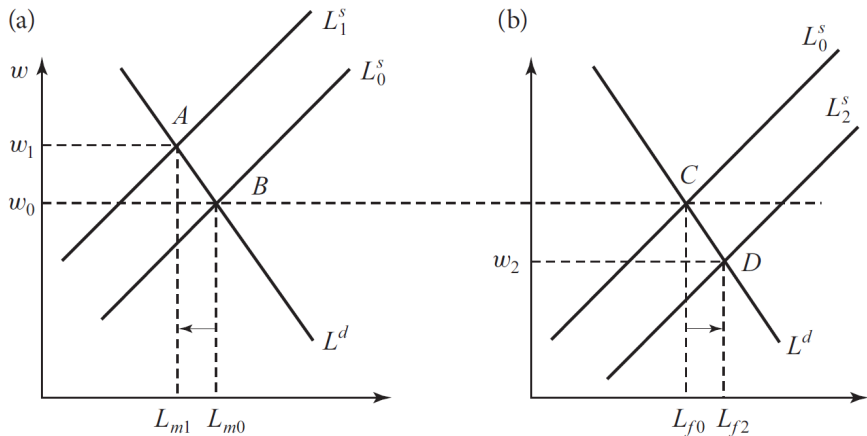


FIGURE 4.5 Occupational crowding: (a) male jobs; (b) female jobs

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		Employment, 1994–2010	Median wage, 1980–2008
			20th	80th		
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

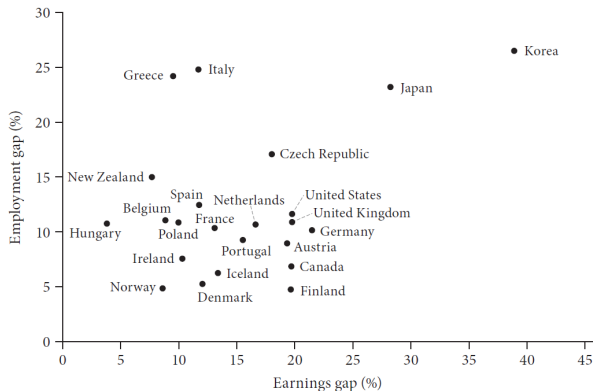


FIGURE 4.6 Gender earnings gap and gender employment gap

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

► Blinder-Oaxaca decomposition

► The sensitivity of Blinder-Oaxaca decomposition

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%.

Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

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%

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?

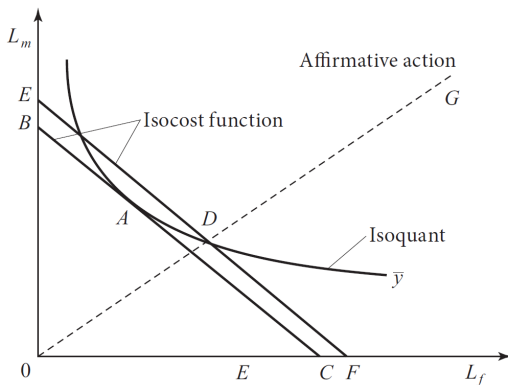


FIGURE 4.7 Nondiscriminatory firms and affirmative action

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 :

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

$$w_f = 200 + 5s + 3e \quad (6)$$

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.

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

September 2013

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Princeton University Press

Chapter 5. Regulation of working hours

Regulation of working hours: What are we talking about?

- May 1, 1886 day of strikes in the US for the introduction of eight-hours working day
- “8 hours” products
- May 1 → Labor Day
- Working hours per week declining
- Working weeks per year declining
- Part-time labor
- Take-up of short-time work schemes

Measures

- Intensive margin of labor supply – working hours (per week)
- Legal “restrictions”
 - Normal working week
 - Maximum number of overtime hours
 - Overtime premiums
 - Sometimes specified over calendar time period
- Bargained “normal” hours
- Share of part-time work in total employment

Cross-country comparison

- In many countries: normal working week is 40 hours
- Wide variation in maximum weekly overtime hours: 2 (Spain), 15 (Netherlands)
- Also wide variation in maximum total working hours
- Overtime premiums mostly 25-50%, sometimes 100%
- Normal weekly hours set by collective bargaining often substantially lower than legal maximum

Cross-country information on working hours

	Legal maxima on working hours			Bargained normal hours	Premium overtime (%)
	Normal	Overtime	Maximum		
Denmark	37	none	48	37	50
France	39	9	48	39	25
Germany	48	12	60	35-39	25
Italy	48	12	60	36-40	10
Netherlands	45	15	60	36-40	
Spain	40	2	47	38-40	
UK	none	none	none	34-40	
US	40	none	none	35-40	50

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

STW Eligibility and Entitlement Conditions for STW scheme

Country	Eligibility Conditions		Entitlement Conditions			
	Justification of economic need	Social Partner Agrt.	Compulsory Training	No Dismissal	Job Search Requir. for Employee	Recovery Plan
Austria	Yes	Yes	No	Yes	No	No
Belgium	Yes	BC: No WC: Yes (or business plan)	No	No	No	BC: No WC: Yes
Canada	Yes	Yes	No	No	No	No
Czech Republic	Yes	Yes	Yes	No	No	No
Denmark	No	Yes	No	No	Yes	No
Finland	Yes	Consultation	No	No	Yes	No
France	Yes	Yes	No	Yes	No	No
Germany	Yes	Yes	No	No	Yes	No
Hungary	Yes	No	Yes	Yes	No	No
Ireland	No	No	No	No	Yes	No
Italy	Yes	CIGO: No; CIGS: Consul.	No	No	No	Yes
Japan	Yes	Yes	No	No	No	No
Luxembourg	Yes	Yes	No	No	No	Yes
Netherlands	No	Yes	Yes	Yes	No	No
Norway	Yes	No	No	No	Yes	No
Poland	Yes	Yes	No	Yes	No	Yes
Portugal			Yes	No		No
Slovak Republic	Yes	Yes	No	No	No	No
Spain	Yes	No	No	No	Yes	Yes
Switzerland	Yes	Individual Agreement	No	No	No	No

► Short-Time Work(STW) throughout the Great Recession

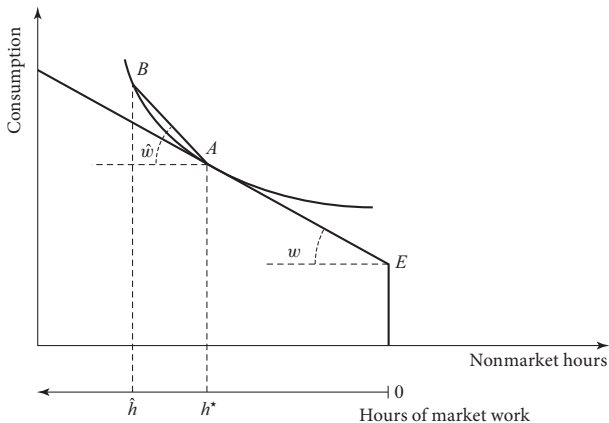
Source: Van Ours and Jan van Ours (2013), The Economics of Imperfect Labor Markets, Princeton University Press.

► Intensive vs. extensive margin

Perfect Labor Market: Labor Supply

- Supply side: choice of number of hours on the basis of the hourly wage rate and preferences for leisure and income
- Working hours per day, working days per week, workweeks per year, working years over lifetime
- Choice of working hours often restricted to a limited set, most commonly full-time, part-time and no-time
- Demand side: cost-minimization taking into account of technologies to substitute workers (L) and hours per worker (h)

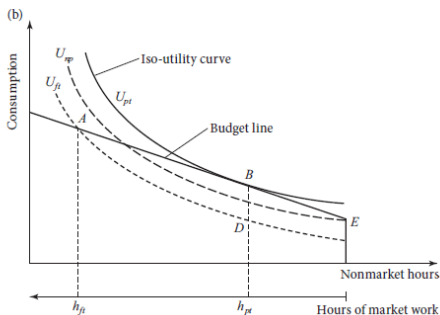
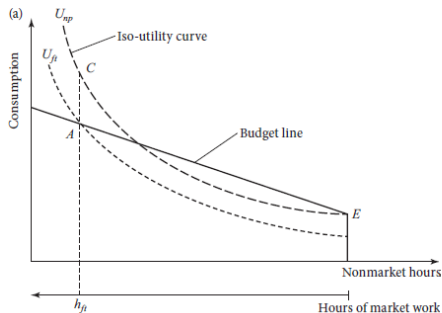
Choice of Hours of Work and the Overtime Premium



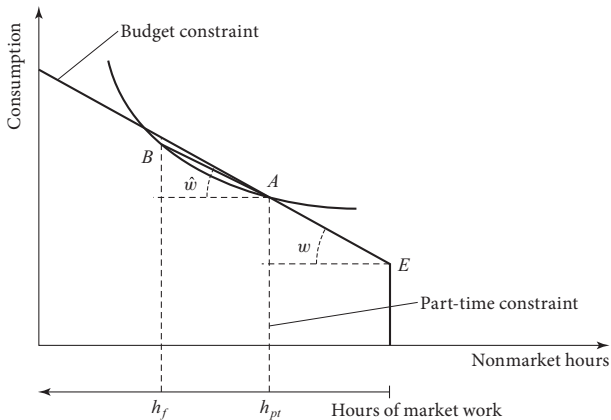
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Choice of Hours of Work

Only Full-Time Jobs Available, Choice Is Nonparticipation (a, Left);
Introducing Part-Time Work, Choice is Participation (b, Right)



Involuntary part-time work



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

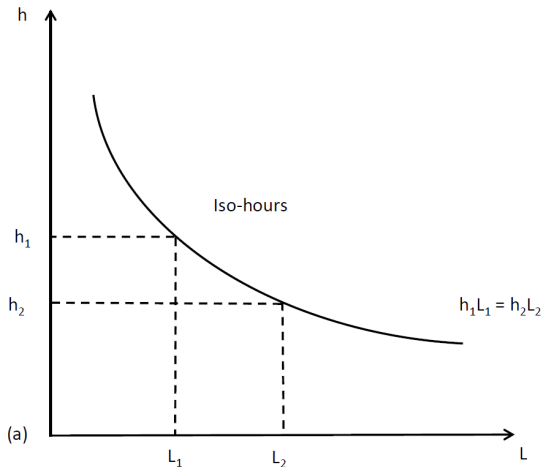
GE (wage effects) of part-time work

- If only full-time jobs are available, introduction of part-time jobs increases labor supply
- Outward shift of labor supply curve lowers wages and reduces full-time employment
- Wage effects explain why unions often oppose part-time?
- Introduction of part-time jobs may also shift the labor demand curve

Imperfect Labor Market - Labor Demand

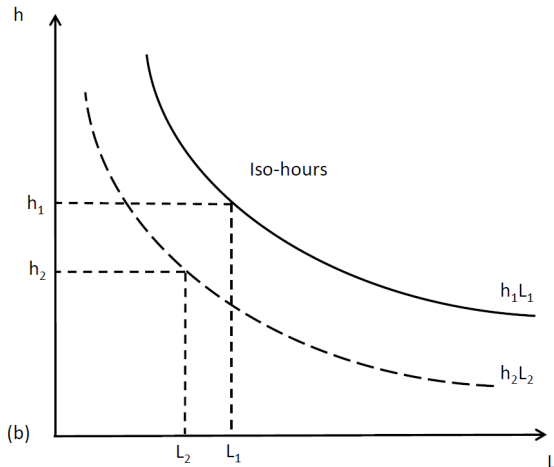
- Shorter working hours \rightarrow less unemployment?
- Lump of labor fallacy
- Iso-labour curve shifts inward: total hours of work reduced with the introduction of shorter working hours

Isolabour and iso-hours curve



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Effects of statutory changes in h



Isolabour and isocost of labour curve

Suppose that output, y , is produced using only labour which requires some combination of workers, L , and hours of work, h . In particular, consider a multiplicatively separable production function

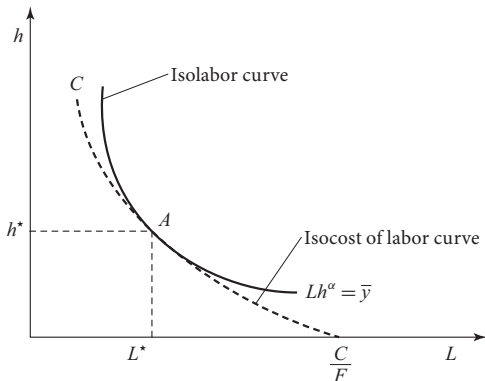
$$y = Lh^\alpha, \text{ where } 0 < \alpha \leq 1$$

Labour costs include variable costs (the hourly wage is w) and recurrent fixed costs per worker, F , i.e.:

$$C = L(F + wh)$$

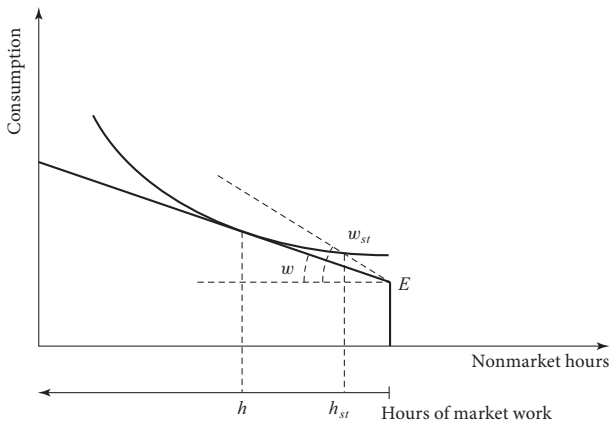
Cost-minimizing choice

Per any given output level (budget), it is chosen the lowest isocost (the highest isolabour curve) (here assuming that $\alpha = 1$):



Short Time Work

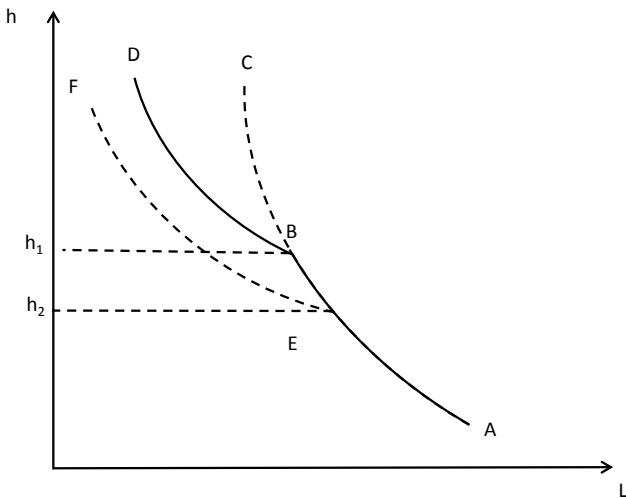
compensating the worker for the reduction in working time



Overtime premium

- If overtime hours pay a higher wage: isocost of labour curve with a kink
- Effects of changes in normal hours depend on where the firm is located
- Monthly or weekly wages may be rigid in which case hourly wages increase as a consequence of reductions in h

A isocost of labour with overtime work



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Empirical evidence - hours of work

- Substantial decline in hours of work between 1950 and 2005
- Large cross-country differences in annual working hours in 2005: 1409 (Netherlands), 1790 (US)
- Anatomy of typical workweek:
 - Weekly hours: 31.8 (Netherlands), 38.8 (Spain)
 - Workweeks per year: 38.4 (Netherlands), 42.2 (Spain)

Working hours

	Average annual hours		Average annual change	Anatomy of annual hours, 2010	
	1950	2005		Hours per week	Weeks per year
Denmark	2,145	1,536	−10.1	34	38
France	2,098	1,439	−11.0	38	39
Germany	2,387	1,408	−16.3	36	41
Italy	2,469	1,778	−11.5	38	41
Spain	1,960	1,674	−4.8	39	41
United Kingdom	2,201	1,650	−9.2	36	41
United States	1,909	1,695	−3.6	—	46

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Box 5.1 Mandatory reduction working hours in France

- François Mitterrand (elected 1981) - 1982:
 - Workweek 40 to 39 hours
 - Without loss in workers' pay
 - **Intention** to reduce to 35 hours in 1985 (not implemented because of economic situation)
- Mandatory nominal (**weekly**) wage rigidity for current minimum wage workers: newly hired workers 2.5% cheaper (double wage structure)
- Crépon and Kramarz (2002): use **39 hours** April 1982 as control group, **40 hours** as treatment group

Crépon and Kramarz (2002)

Probability to lose job (%):			
	1982-84	1985-87	Diff.
40 hours	16.5	11.9	4.6
39 hours	12.6	12.1	0.5
Diff.	3.9	-0.2	4.1

- So: 4.1% job loss on average due to reduction in working hours
- For low-wage workers for whom the reduction in hours was associated with monthly pay rigidity: 8.4% points
- Quite high as the reduction in working hours was only 2.5% (1 hour from 40)

35 hours week – Estevão and Sá (2008)

- Lionel Jospin: 1998 workweek to 35 hours:
 - February 2000: large firms (> 19 workers)
 - January 2002: small firms (< 20 workers)
- Government not stupid: also measures to reduce labor costs:
 - Small firms: overtime premiums reduced
 - Social rebates were offered
 - More flexible accounting of overtime work (annual in stead of weekly)
- Argument = reduction in labor costs & increase in productivity:
no need to cut monthly wages

Experimental design – Estevão and Sá (2008)

- Treatment group: large firms (20-49 workers)
- Control group (up to 2002): small firms
- Study wage effects (hourly, monthly), employment (level, inflow, outflow), dual job holdings, job satisfaction
- Working ≤ 35 hours (%)

	Small firms	Large firms	Difference
1997	25.5	24.6	-0.9
1998	26.3	25.9	-0.4
1999	27.1	27.6	0.5
2000	31.4	43.6	11.2
2001	34.3	52.1	17.8
2002	57.3	64.4	7.1

Effects – dif-in-dif estimates

Difference in differences estimate:

Year	from employment to unemployment		share of workers with (%) multiple jobs (%)		Hourly wage (%)		Monthly wage (%)	
	Men	Women	Men	Women	Men	Women	Men	Women
1998	0.8	0.1	0.1	-1.1	0.9	-0.4	0.2	-0.4
1999	3.9	-0.5	-0.1	0	2.1	-1.7	0.6	0.2
2000	2.7	0.6	0.7	-0.03	3.4	1.3	0.5	-0.4
2001	1.0	2.1	-0.1	-0.2	3.7	2.0	1.1	-0.8
2002	1.4	-1.2	0.04	-0.03	3.0	0.0	0.3	0.1

Furthermore:

- Hardly any effect on dual jobs
- More turnover
- No employment effects
- Less satisfaction about hours (except for high income women)

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Part-time jobs (%)

Part-time jobs (%)

	PT employment		Involuntary PT		PT preferring FT		FT preferring PT	
	Men	Women	Men	Women	Men	Women	Men	Women
Denmark	14.3	25.4	10.4	12.8	69	8	7	21
France	5.7	22.4	26.6	28.4	69	35	11	25
Germany	8.1	38.3	20.8	12.9	52	12	5	10
Italy	6.2	32.6	44.8	39.6	83	42	22	32
Netherlands	17.1	61.6	6.7	5.0	25	7	13	23
Spain	5.6	22.6	67.5	54.9	36	37	8	14
United Kingdom	10.5	38.1	27.0	12.2	72	22	3	9
United States	8.4	17.1	13.7	10.3	—	—	—	—

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

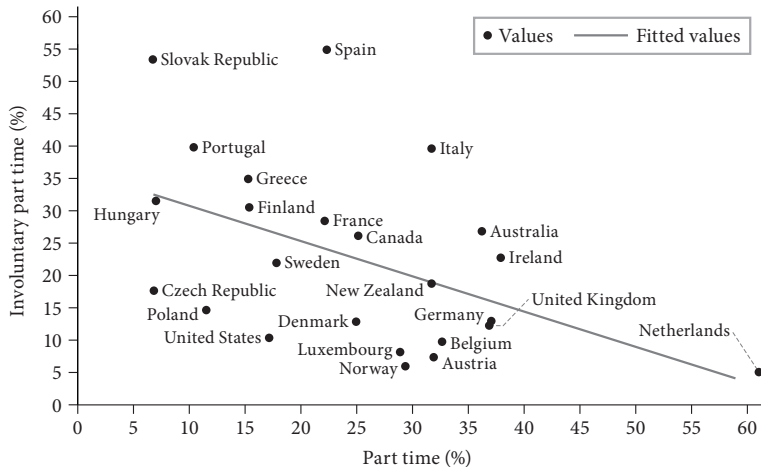
Cultural attitudes towards part-time jobs

Old discussion – see Sundstrøm (1991)

- **Negative** view: trap leading to marginalization of women
- **Positive** view: provide opportunity for continuous employment for those women for whom full time work is not possible

► Changes in employment rate 1997-2007

Involuntary part-time work



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Policy issue 1:

Should governments regulate working hours?

- Efficiency reasons:
 - If employers have monopsony power – working time reduction (over a small range) → increase in employment
 - Negative externalities without regulation – “rat race”
- Employment is not a lump-of-labor that can be redistributed at no costs
- Difficult to find strong arguments in favor of government intervention

Policy issue 2:

Should governments stimulate part-time labor?

- Cross-country differences due to differences in institutional arrangements and union resistance
- Growth of part-time jobs may stimulate full-time employment (Netherlands)
- Part-time jobs may facilitate combination of work and care

Policy issue 3:

Should governments use STW during recessions?

- Only if recessions are relatively large
- Otherwise STW may backfire reducing reallocation and creating structural unemployment
- Important to work on design features of STW

► Implied % of Jobs "saved" by STW depending on output fall

Overlaps with other institutions

- Collective bargaining and unions – tradeoffs wages & hours
- Family policies – balancing work and family life
- Employment protection legislation – adjustment costs
- Unemployment benefits – substitute for STW

Why does regulation of working hours exist?

- Hours of work is rarely the outcome of a market process
- Market failures: conflicting preferences of workers and employers, institutional restrictions
- Unions only represent interests of their workers
- Governments may influence hours of work for social reasons (family life) or because they want to influence composition of unemployment (early retirement schemes)

Why STW?

- Other institutions (UB and EPL), provide insurance against job loss, but do not operate on intensive margin
- STW encourages hours reduction by
 - ① increasing cost savings of reducing working time (employer)
 - ② minimizing the fall in take-home pay (employee)
- Reduced response of hourly wages to hours adjustment as workers are compensated for falls in hours:

Review Questions

- 1 Under what conditions does work sharing lead to an increase in employment, and how plausible are these conditions?
- 2 Why do firms employ part-time workers instead of full-time workers?
- 3 How does overtime work affect the trade-off between hours and workers?
- 4 Why do overtime premiums exist?
- 5 What happens if the standard working week is reduced in a situation where workers work overtime?
- 6 When is short-time work appropriate?

Exercise

- 1 Illustrate the hours-workers trade-off.
- 2 What happens when there is an overtime premium? Suppose now that there is no choice in terms of hours.
- 3 Show graphically what happens to the reservation wage of a single individual in this case.
- 4 How does this reservation wage change when part-time jobs are introduced?
- 5 Can this explain why unions oppose the introduction of part-time jobs?

Intensive and Extensive Margins (I)

The total labor costs of the firm is:

$$C = (wh + \omega w(h - \bar{h})d + F)L,$$

where $F > 0$ are the fixed costs of workers, w is the hourly wage, h is the actual weekly working hours, ω is the hourly overtime premium, \bar{h} is the standard workweek, d is a binary variable that has a value of 1 if $h \geq \bar{h}$ and a value of 0 otherwise, and L is the number of workers in the firm.

The production function is:

$$y = Lh^\alpha,$$

where $\alpha \leq 1$.

Intensive and Extensive Margins (II)

For any given level of production \bar{y} , the firm minimizes labor costs Λ , solving

$$\min_{L,h} \Lambda = (wh + \omega w(h - \bar{h})d + F)L + \lambda(\bar{y} - Lh^\alpha),$$

where λ is the Lagrange multiplier.

After some algebra we obtain the optimal number of hours:

$$h^* = \frac{\alpha(F - \omega w\bar{h}d)}{(1 - \alpha)w(1 + \omega d)},$$

and the optimal number of workers

$$L^* = \bar{y} \left(\frac{\alpha(F - \omega w\bar{h}d)}{(1 - \alpha)w(1 + \omega d)} \right)^{-\alpha}.$$

Intensive and Extensive Margins (III)

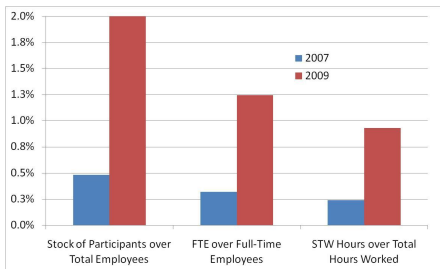
From these two optimal conditions we can derive the following results:

Effects of changes of	on hours (h^*)	on employees (L^*)
\bar{y}	0	+
F	+	-
\bar{h}	-	+

ADDITIONAL MATERIAL:

Short-Time Work (STW) throughout the Great Recession

Short-time work, take-up rates in 10 OECD countries (nonweighted average):



Note: countries include Austria, Belgium, Canada, Finland, France, Germany, Italy, Japan, Norway and Switzerland.
Source: OECD, Hijzen and Venn (2010).

Intensive vs. extensive margin

During the Great Recession, in some countries more adjustment along the intensive margin than under previous recessions. Decomposition of variation of total hours (H) in hours per worker (h) and number of workers (L):

$$\Delta \log(H) = \Delta \log(h) + \Delta \log(L)$$

Contribution of the intensive margin to total hours adjustment

Country	2008-2009	Previous Recessions
Canada	56%	41%
France	55%	58%
Germany	117%	48%
Italy	79%	31%
Japan	91%	89%
UK	48%	46%
US	36%	47%

Note: past recessions include 1974-1975 and 1991-1993. Peak-to-trough defined following total working hours dynamics

Source: number of workers, OECD MEL; average hours worked, IMF and OECD Economic Outlook une 2010.

The rationale for STW

Consider production function

$$y = Lh^{\alpha}$$

where

$$0 < \alpha < 1$$

and cost function

$$C = L(F + wh)$$

Cost minimization over h and L obtains the (conditional) demands for hours and workers:

$$h = \frac{\alpha}{1 - \alpha} \frac{F}{w} \text{ and } L = \frac{y((1 - \alpha)w)^{\alpha}}{(\alpha F)^{\alpha}}$$

hence

$$\frac{dh}{dy} = 0 \text{ and } \frac{dL}{dy} > 0$$

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

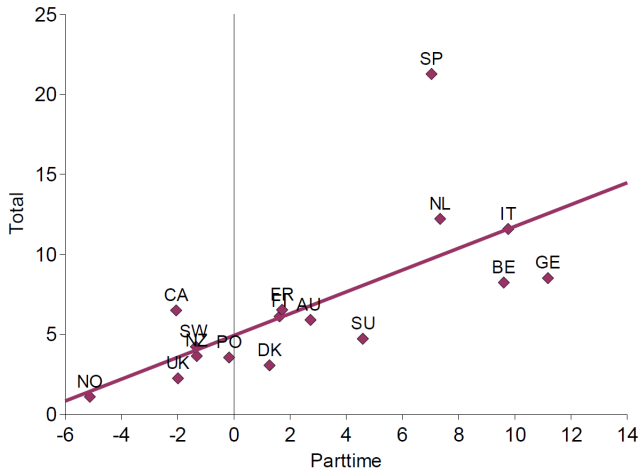
The bias towards workers adjustment

Notice that:

- **per given hourly wages** a negative shock to output, will be accommodated by reducing the number of workers rather than by reducing the hours of work
- with hourly wages increasing (as h falls), the optimal choice of hours of the firm is also independent of y
- in a more general case, small adjustments of hours if F is small

◀ STW – labor supply

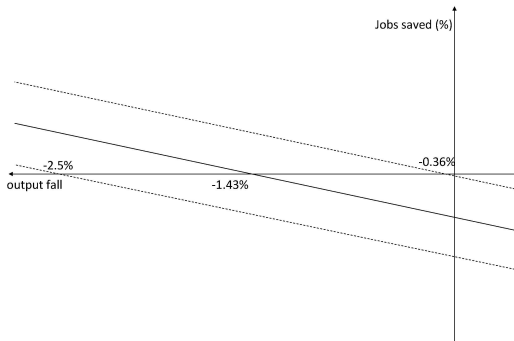
Changes in employment rate 1997-2007



◀ Cultural attitudes towards part-time jobs

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Implied % of Jobs "saved" by STW depending on output fall



◀ Policy issue 3: Should governments use STW during recessions?

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

October 2013

Tito Boeri and Jan van Ours (2013)

The Economics of Imperfect Labor Markets

Princeton University Press

Chapter 6. Retirement Programs

What are we talking about?

- From a historical perspective large-scale retirement of workers rather recent phenomenon
- Until “recently”: workers worked until they died or got seriously ill
- Today, retirement = extended period of self-financed independence & leisure
- Forced retirement - mandatory retirement age
- Public pensions are pay-as-you go schemes
- Private pensions can be fully funded
- Defined benefit (DB) – contribution varies
- Defined contribution (DC) – benefits vary
- Early retirement programs - offers that cannot be refused

Measures

- Pension wealth: present value of stream of expected pension benefits
- Benefit accrual = difference between pension wealth at retirement age a and retirement age $a + 1$
- Benefit accrual - implicit tax/subsidy
- Earliest retirement age - related to early retirement programs
- Standard retirement age - government pensions

Pension wealth & benefit accrual

Assume constant pension benefits B , a is the date of the (early) retirement. Pension wealth PW is

$$PW(a) = \sum_{t=a}^T \frac{B(a)}{(1+i)^{t-a}} = B(a) + \sum_{t=a+1}^T \frac{B(a)}{(1+i)^{t-a+1}}$$

where i is the rate at which future pension benefits are discounted. If she instead decides to work an additional year

$$PW(a+1) = \sum_{t=a+1}^T \frac{B(a+1)}{(1+i)^{t-a+1}}$$

Thus, the benefit accrual BA is given by

$$BA(a+1) = PW(a+1) - PW(a) = -B(a) + \sum_{t=a+1}^T \frac{B(a+1) - B(a)}{(1+i)^{t-a}}$$

Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Defined Benefit & Defined Contribution

Defined Benefit system:

$$B(a+1) = B(a) = B$$

hence

$$BA(a+1) = -B$$

In other words, the worker suffers a loss in her pension wealth by postponing retirement.

Defined Contribution system:

$$B(a+1) = B(a)(1 + \xi)$$

where ξ is the change in the annuitization (in the yearly pension amount) brought about by an additional year of work.

For large T , $BA(a+1) \simeq -B + \frac{\xi B}{i}$.

$BA(a+1) > 0$ if $\xi > i$, i.e. if the benefit accrual associated with an extra year of work is higher than the market interest rate.

Notional Defined Contribution

“Financial account” scheme:

- Workers contribute during working life & draw **benefits based on lifetime contributions** after retiring ...
- ...however, benefits **not** invested in financial assets: contributions flow through Social Security system to cover current pensions. It is still a pay-as-you go scheme
- Returns on contributions and **annuitisation** depend on growth.

Retirement decision

- Benefit accrual = implicit tax ($BA < 0$) or implicit subsidy ($BA > 0$)
- Whether or not a person retires at age a also depends on wage and preferences for income and leisure

Cross-country retirement

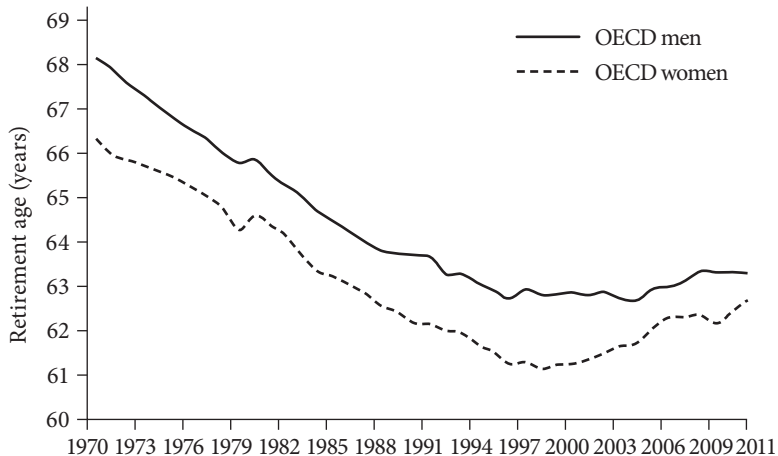
	Retirement ages							Pension Repl Rates Males
	Earliest Males			Standard Males		Standard Females		
	1969	2001	2011	1969	2011	1969	2011	
Denmark	67	65	n.a.	67	67	67	67	94.5
France	60	60	56	65	60	65	60	60.8
Germany	65	63	63	65	67	65	67	58.4
Italy	55	57	61	60	65	55	60	76.2
Netherlands	65	60	n.a.	65	65	65	65	103.3
Spain	65	60	61	65	65	55	65	84.5
UK	65	65	n.a.	65	68	60	68	48.0
US	62	62	62	65	67	65	67	53.4

Pension replacement rates: Full-career workers with average earnings – net replacement rate with mandatory retirement

Cross-country comparison

- Standard and earliest retirement age ↓
- Most common standard retirement age: 65
- Variation in retirement incentives
- Net replacement rate for public old-age pensions
 - About 50% in UK
 - About 100% in the Netherlands

Men-women comparison

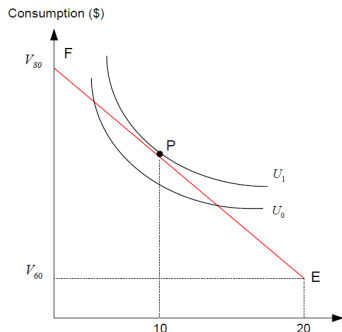


Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Retirement theory static – defined benefits

- Lifetime incomes are higher the longer workers put off retirement
- If pension benefits are constant, wage increases have a substitution and income effect, so lifetime income may not be altered
- An increase in pension benefits reduces the price of retirement, increasing the demand for leisure, encouraging the worker to retire earlier: **Income effect & substitution effect work in the same direction**

The retirement decision



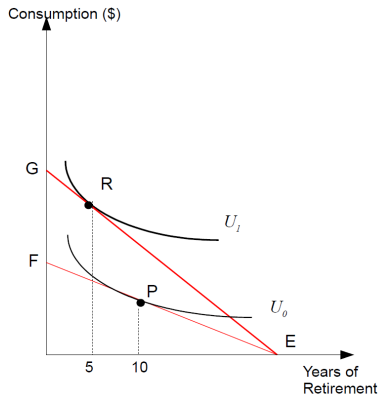
Death at 80:

Point E leisure-consumption bundle if retirement at age 60.

Point F if the worker never retires.

A utility-maximizing worker chooses point P, and retires for 10 years.

The retirement decision

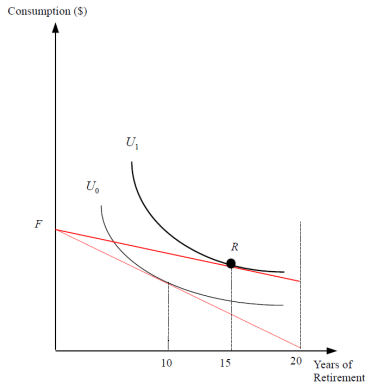


An increase in the wage rotates the budget line around point E, and generates both income effects and substitution effects as the worker moves from point P to point R.

The figure assumes that substitution effects dominate and the worker delays his retirement.

$SE > IE$: work longer

The retirement decision



An increase in pension benefits rotates the budget line around point F.

It too generates income and substitution effects, but both effects encourage the worker to retire earlier.

Both effects same direction: work shorter

Theory option value

- Continue to work if expected present value of continuing work is greater than expected present value of immediate retirement
- Option value of work: positive - postpone retirement; negative - retire
- Eligibility for early retirement: downward shift in option value - offer you can't refuse
- Incentives may depend on benefit systems:
 - DB: retire later: no effect on pension benefits
 - DC: retire later: higher pension benefits

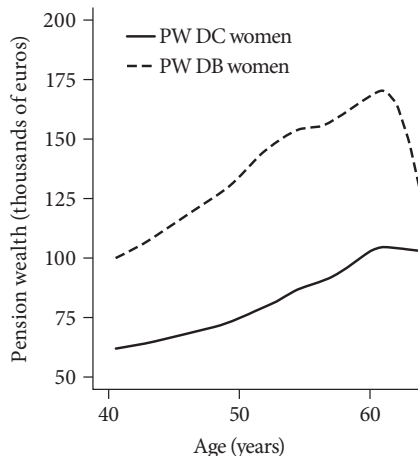
Average age of transition to inactivity

	Men			Women		
	1967	2002	Change	1967	2002	Change
Denmark		65.3			62.1	
France	67.3	59.3	-8.0	66.8	59.4	-7.4
Germany		60.9			60.2	
Italy	64.3	61.2	-3.1	59.6	60.5	0.9
Netherlands		61.0			59.1	
Spain		61.6			61.3	
UK		63.1			61.2	
US	69.9	65.0	-4.9	68.6	61.9	-5.7

Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

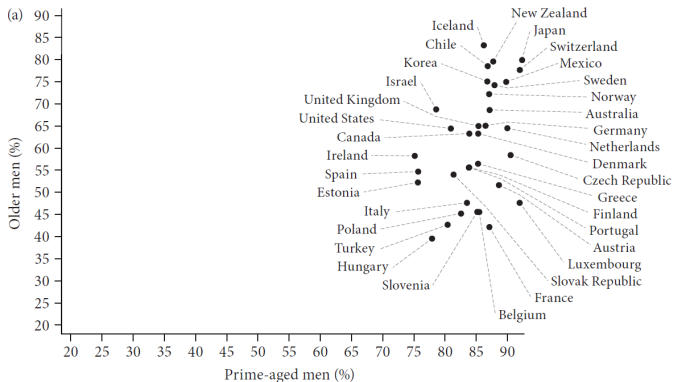
Pension Wealth

Pension wealth under the pre-reform (DB) and post-reform (NDC) rules by age. Italy, Women



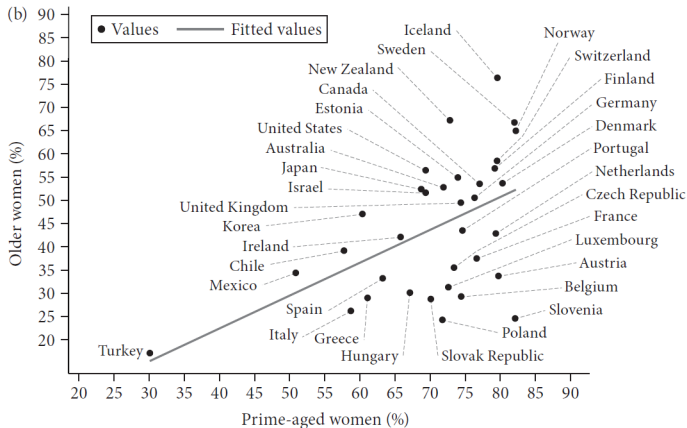
Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Employment rates men – 2005



Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Employment rate women – 2005



Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Box 6.1 Stimulating early retirement in Norway

- Standard retirement age = 67
- Entitlement to early retirement (AFP):
 - 66 up to 1990
 - 65 in 1990
 - 64 in 1993
 - 63 in 1997
 - 62 since 1998
- AFP:
 - “Dignified” exit from labor force
 - Benefits related to public benefits age 67
 - Replacement rate exceeds 100% for low incomes; 65% for medium incomes

Box 6.1 Bratberg, Holmås and Thøgersen (2004)

- Analysis as if “natural experiment”
- Non-AFP firms and AFP firms (requires 3 years of employment at present firm)
- Identifying assumption: no selection on unobservables into the AFP firm
- October 1993: reduction eligibility age 65 to 64
- Labor market 3 months after 64th birthday:
 - Birthday January — March 1993: control group – may retire at 65
 - Birthday January — March 1994: treatment group – may retire at 64

Results of dif-in-dif analysis

3 months after 64th birthday

	Control			Treatment			
	AFP: may retire at 65			AFP: may retire at 64			
AFP	yes	no	Δ	yes	no	Δ	$\Delta\Delta$
Work	82.6	83.8	1.2	64.7	86.0	21.3	-20.1
AFP	—	—	—	26.0	—	-26.0	26.0
Other	17.4	16.2	-1.2	9.3	14.0	4.7	-5.9
Total	100	100	0	100	100	0	0

Use of AFP: largest part leaves work – only small part has more “dignified” exit

Empirical evidence - age and productivity

- Older workers: more reliable, better skills
- Older workers: high health costs, low flexibility, less suitable for training
- Age-productivity profile not exogenous to institutions
- Age-productivity relationship difficult to establish but employers have strong opinions about the productivity of older workers

► Run for fun (10km)

Run for fun 10 years (1998-2008)

fixed effects estimates

	Speed (km/h)	Age effect (%)	Observations	Individuals
Men				
<1950	12.8	-1.2(8.3)**	217	74
1950-59	13.3	-0.5(6.3)**	578	170
1960-69	13.8	-0.5(3.7)**	355	125
>1970	15.5	0.2(0.7)**	133	47
Women				
<1950	11.1	-1.4(2.9)**	18	7
1950-59	12.1	-0.7(3.1)**	130	41
1960-69	11.9	0.2(0.8)	84	31
>1970	12.8	0.6(0.7)	35	7

t-statistics in parentheses

Montizan, Cörvers, De Grip (2010)

- Aim: identify effects of exogenous changes in pension system on workers' investment in human capital
- Natural experiment, Dutch public sector (2006)
 - Workers born in 1950 or later: abolishment of pre-pension plans
 \iff postponement of retirement (treatment group, T)
 - Workers born before 1950: no abolishment of pre-pension plans (control group, C)

Results:

- Postponing retirement by 1 year leads to 1.3% higher training attendance
- Detrimental effect of early retirement on human capital formation
- However, results are only significant in large organizations

► Did the people understand the reform?

Effects of the Dutch reform on training participation (%)

	Born in 1949	Born in 1950	Δ	$\Delta\Delta$
2005	50	50	0	
2006	54	57	3	+3

So: age-productivity profile = endogenous

Schnalzenberger, Winter-Ebmer (2009)

- Austria, 1996-2000: Introduction of **tax on layoff of older workers** on employers: up 170% of monthly income if worker older than 50
- Does introduction of new tax decrease firing of such workers? Diff in diff approach:
 - Treatment group: workers above 50
 - Control group: workers aged nearly 50

	Men		Women	
	1996	2000	1996	2000
Displacement	1.10	1.01	1.66	1.41
$\Delta_{[>50 - <50]}$	0.04	-0.28	-0.8	-0.47

Policy issue 1:

Should mandatory retirement age be increased?

- Lazear (1979): delayed compensation contracts: age-earnings profile upward sloping to prevent workers from shirking
- Issue of selection: least productive workers most likely to retire first
- U.S. study: neither job tenure nor wage profiles of older workers were affected by changes in mandatory retirement; so mandatory retirement not a unique instrument to end long-term relationships (demotion)
- Increase mandatory retirement age may be neither necessary nor sufficient to increase labor force participation among older workers – see low employment rates of age group 56–64.

Box 6.2 Elimination mandatory retirement age US

- 1986: Age Discrimination in Employment Act - mandatory retirement abolished
- Temporary exemption for postsecondary institutions to enforce mandatory retirement at age 70
- Mandatory retirement age for college and university professors expired in 1994 - [federal law](#)
- Analysis of FRS - Faculty Retirement Survey
- Two types of institutions (according to [state laws](#)):
 - **Capped**: could enforce mandatory retirement
 - **Uncapped**: were prohibited to enforce mandatory retirement
- [DC pension benefits](#)

Ashenfelter and Card (2002)

	Mandatory retirement	No mandatory retirement	Diff.
Probability to stay to age 70 (%)			
From age 60	26.1	25.4	0.7
From age 65	39.2	38.6	0.6
Employment outcome if work at age 70 (%)			
Leave at 70	76.6	29.6	47.0
Employed at 71	23.4	70.4	-47.0
Employed at 72	8.4	51.6	-43.2
Employed at 73	6.3	39.4	-33.1

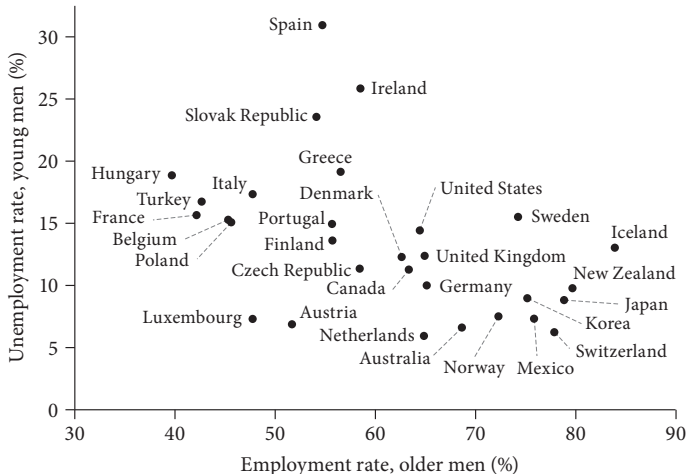
- No effects below age 70
- Substantial reduction of retirement among 70 and 71 year olds
- Higher salary & lower wealth – less likely to retire at given age

Policy issue 2:

Should early retirement programs be phased out?

- In many countries early retirement policies introduced as a short-term policy response to combat unemployment
- **Lump-of-labor fallacy**: see also working hours chapter
- May have affected perception of employers and workers themselves vicious circle of perceptions that lack a solid empirical basis

Employment older men & unemployment young men – 2006



Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Overlaps with other institutions

- Training and time horizon to retirement age
- Unemployment benefits – alternative outflow from a job
- Employment protection legislation – adjustment costs; early retirement sometimes the cheapest (only) way to get rid of older workers

Should Public Pensions become NDCs?

NDC is new conventional wisdom in pension systems:

- 1 ensure long-term financial sustainability of the system
- 2 reduce existing distortions in labor markets (incentives to retire early)
- 3 increase intergenerational equity of the system
- 4 makes contributions look like deferred consumption
- 5 reduce political interference w/pension systems, as automatic adjustments do not require government intervention
- 6 however not easy to understand and to introduce. design can be substantially altered (e.g., Italy)

Why do early retirement programs exist?

- Lump-of-labor fallacy not present: countries with high employment of elderly workers have a low youth unemployment rate
- Argument in favor of early retirement programs: health problems
- However: life expectancy increased substantially & health of older individuals improved greatly
- Beneficial to workers who retire early – incumbent workers pay
 - Government: reduce youth unemployment
 - Employers: easy way to get rid of older workers
 - Unions: older members prefer to retire
- Little reason not to abolish early retirement programs

Review Questions

- 1 What is the difference between a defined-benefit (DB) and a defined-contribution (DC) pension system?
- 2 Why do people generally retire more gradually under a DC system than under a DB system?
- 3 Why is early retirement not a good instrument to reduce youth unemployment?
- 4 In Lazear's model, why do wages increase with tenure, and how does that affect retirement programs?
- 5 How would an increase in the standard retirement age affect the behavior of employers and workers?

Exercise(I)

Joe has worked until reaching the age of 60. He now has two options. The first is to work for another 5 years, earning 40,000 euros per year, retire at age 65, and collect a pension of 10,000 euros per year for the following 15 years. The second option is to retire immediately and collect a yearly pension of X euros for the next 20 years. Suppose that a euro received today is worth 1.05 euros received next year.

Exercise(II)

- ① What value of X gives the worker the same total income (earnings and retirement benefits) in net present value terms in the two options?
- ② What value of X gives the worker the same pension wealth in the two options?
- ③ Consider a state-provided medical insurance which is provided free to persons as long as they continue to work up to the age of 65. Those under 65 years of age who are not working can purchase this health insurance for 5,000 euros per year. If Joe values retiring at age 60 over retiring at age 65 at 200,000 euros, for what value of X would he retire at age 60?

Optimal Retirement Age (I)

A more general framework to analyze retirement decisions: the option value of retirement model (Stock and Wise, 1990). The total net present value of retirement at age a is

$$NPV_t(a) = \sum_{t=t_0}^{a-1} \left(\frac{1}{1+i} \right)^{t-t_0} U(w_t) + \sum_{t=a}^T \left(\frac{1}{1+i} \right)^{t-t_0} U[B_t(a)].$$

where t is an indicator of age, U is a function indicating the (indirect) utility that the person derives from the wage earnings w_t , $\frac{1}{1+i}$ is the discount factor, t_0 is the age at which the individual starts working, a is the age at which he/she retires, T is the age until he/she lives and $B_t(a)$ is the pension benefit.

Optimal Retirement Age (II)

$$NPV_t(a) = \sum_{t=t_0}^{a-1} \left(\frac{1}{1+i} \right)^{t-t_0} U(w_t) + \sum_{t=a}^T \left(\frac{1}{1+i} \right)^{t-t_0} U[B_t(a)].$$

Postponing retirement increases the length of the first period and reduces the length of the second one, this has a positive effect on the value of retirement. However, if a person postpones retirement, she or he will have fewer years of receipt of the pension. This second effect will decrease the value of retirement. Of the two effects, the first is initially more important, but eventually the second effect dominates. Thus, there must be some age a^* where there is a maximum value of retirement.

Optimal Retirement Age (III)

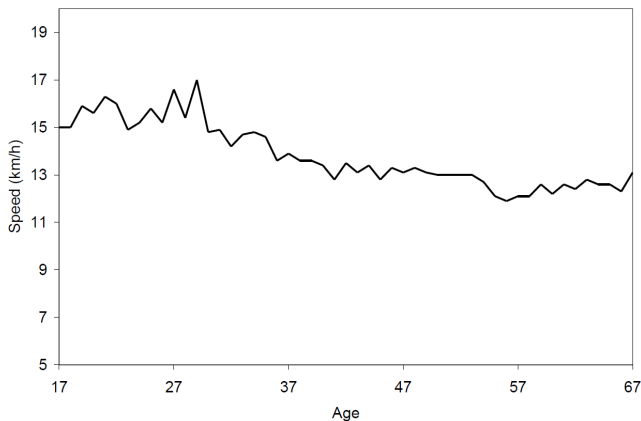
The option value OV of retirement compares the expected lifetime utility of retiring today and the expected lifetime utility of postponing the decision until the optimal retirement age a^* , that is,

$$OV_t(a^*) = E_t[NPV(a^*)] - NPV_t(a).$$

A worker is expected to retire if the utility of retiring at a^* is smaller than the utility of retiring today, that is, if the option value is negative.

ADDITIONAL MATERIAL:

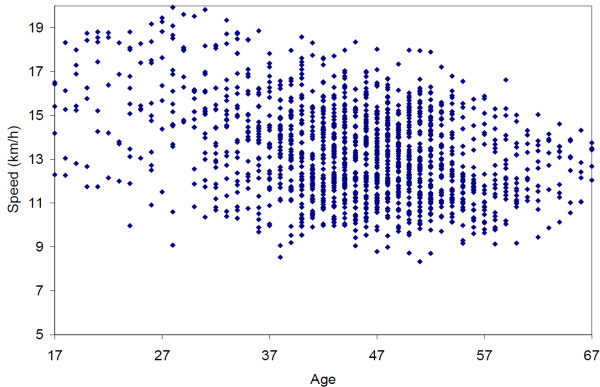
Run for fun (10 km)



◀ Empirical evidence - age and productivity

Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Run for fun (10 km)

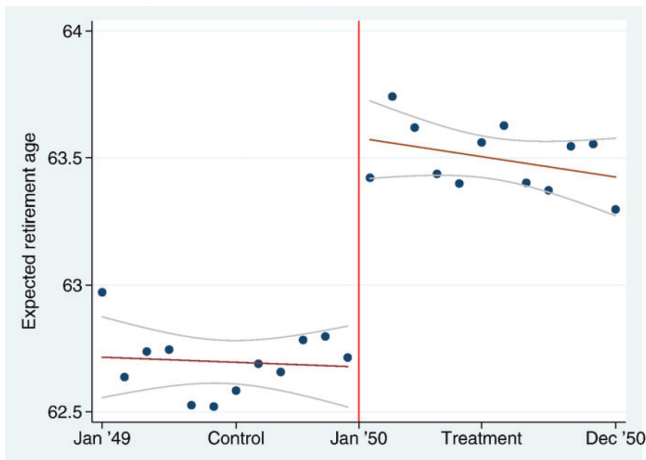


◀ Empirical evidence - age and productivity

Source: Tito Boeri and Jan van Ours (2008), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Did the people understand the reform?

Expected retirement age by month of birth



The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

October 2013

Tito Boeri and Jan van Ours (2013)
The Economics of Imperfect Labor Markets
Princeton University Press

Chapter 7. Family policies

Family policies: What are we talking about?

- For parents, labor supply, leisure and child care decisions are interdependent
- Presence of young children increases the value of parents (mothers) time at home
- Family policies:
 - Parental leave facilities
 - Childcare arrangements
- Trade-off: female labor force supply & fertility

Measures

- Formal childcare arrangements: government supported or market based
- Duration of maternity leave
- Maternity benefits
- Total duration of maternity and childcare leave

Childcare and maternity leave (2007–2008)

	Childcare spending (% of GDP)	Young Children having formal childcare (%)		Duration of base Maternity leave (weeks)	Base maternity benefits (% of av. wage)	Total duration of leave (base + optional) (weeks)
		Age<3	Age≥3			
Denmark	1.32	66	92	18	50	46
France	1.01	42	100	16	100	159
Germany	0.39	18	93	14	100	162
Italy	0.62	29	97	20	80	26
Netherlands	0.72	56	67	16	100	26
Spain	0.45	37	99	16	100	162
UK	1.09	41	93	52	25	52
US	0.38	31	56	12	0	12

OECD Family Database (2011).

Note: 2nd and 3rd column concerns the years 2007–2008; last three columns concern year 2008.

Cross-country comparison

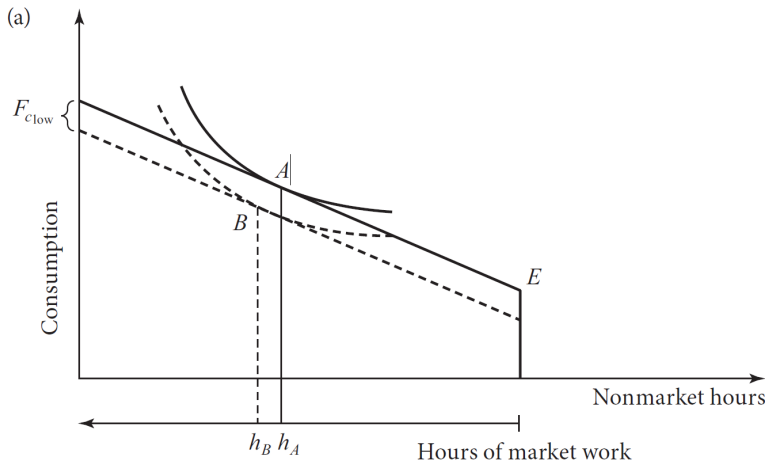
- Differences in the use of formal childcare arrangements for young children ($< \text{age } 3$): Germany: 18%, Denmark: 66%
- Many European countries: child care use age ≥ 3 close to 100%
- Large differences in parental leave (usually maternity leave)
 - Duration: 52 weeks (UK), 12 weeks (US)
 - Benefits: 0 (US), 100% (many countries)
- Parental leave: subsidized and/or job protection

Theory childcare facilities

- Static labor supply framework - mother maximizing utility
- Childcare provision:
 - Fixed costs: shifts income curve
 - Variable costs: rotates income curve
- Childcare subsidies:
 - Stimulate participation
 - Increase working hours

Income and leisure

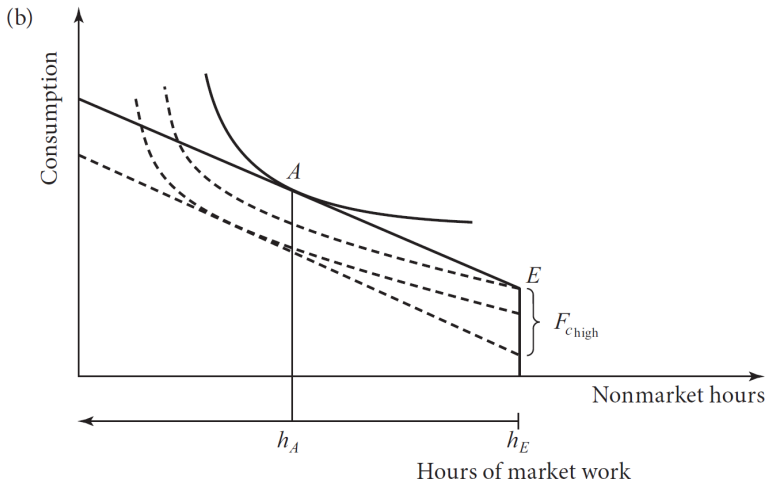
Labor supply of women and fixed costs of children



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Income and leisure

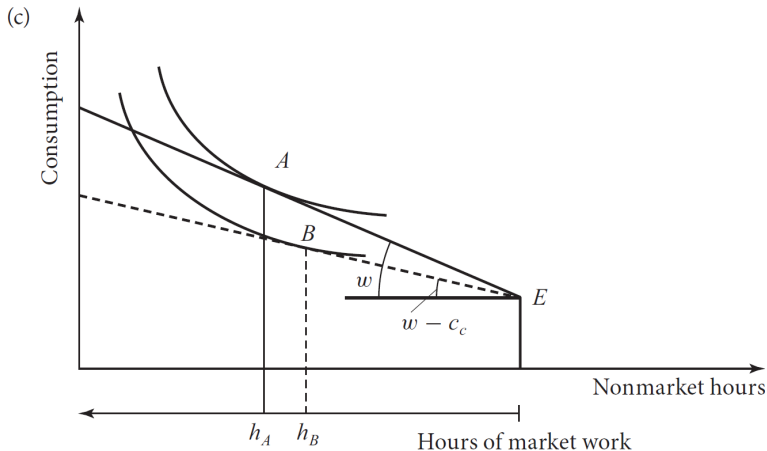
Labor supply of women and **fixed** costs of children



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Income and leisure

Labor supply of women and **variable** costs of children

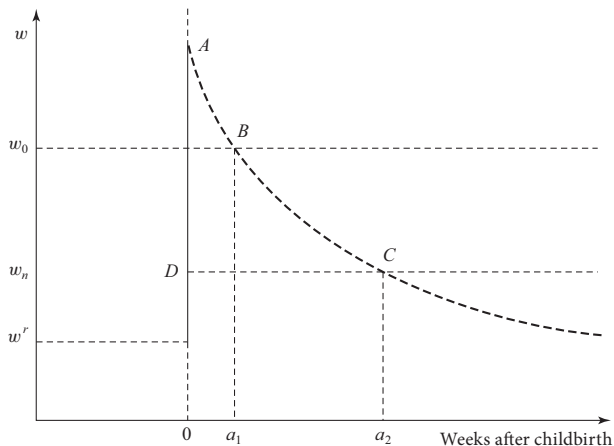


Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Theory parental leave

- Parental leave often equivalent to maternity leave
- Form of subsidized childcare - subsidy not provided to external services but to the parents who are providing child care themselves
- Positive effect on labor supply of mothers
- Negative effect on labor demand (wage costs increase)
- Female wages go down → employment effects?

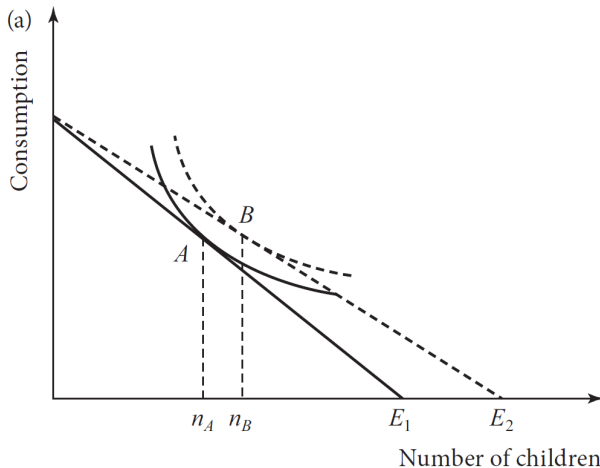
Parental leave and return to work after childbirth



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Fertility and family policy (I)

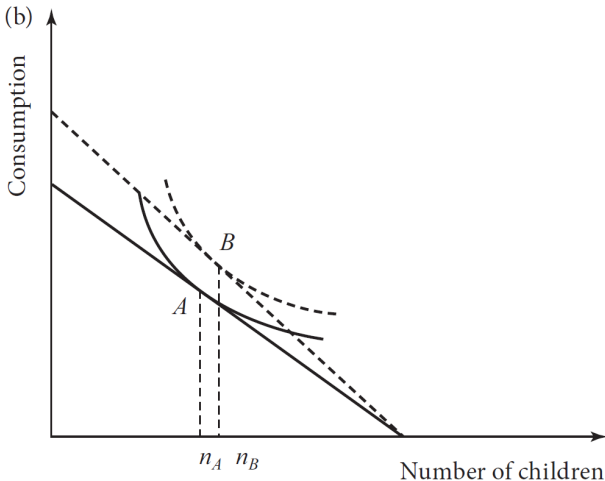
Effect on fertility of parental leave and subsidized childcare



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Fertility and family policy (II)

Effect on fertility of greater earning capacity of women



► Income effect (Malthus)

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Empirical evidence

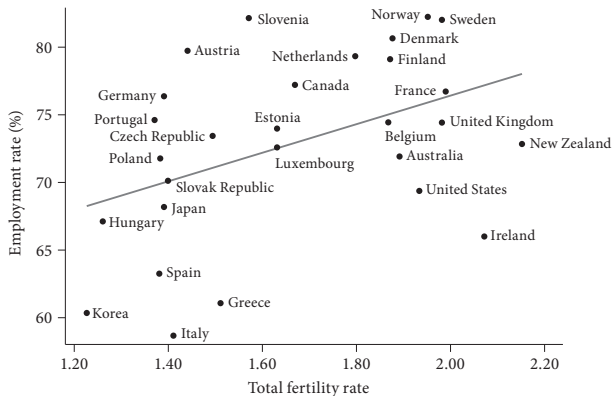
- Employment rate of women strongly affected by presence of children in some but not all countries
- Lone mothers higher-lower employment rate than mothers who are part of a couple
- Part-time work among female employees increases with the number of children - except in Denmark

A trade-off between fertility and employment?

- Employment policies interact with cultural and social customs
- Some countries limited use of external childcare facilities because of social stigma related to sending children to these facilities
- Economic terms: fixed - psychological - costs related to the use of childcare
- Cross-country: positive relationship between fertility and employment rates of prime-age women

Employment - Fertility (2010)

Prime-aged women



► Change over time in the correlation work-fertility

► Income and leisure

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Women's employment rates by presence of children (2010)

Women's employment rates by presence of children under 6

	0	1	2	+ 3	Total
France	80.0	78.5	78.4	58.2	76.7
Germany	82.9	74.7	69.1	50.1	76.3
Italy	63.2	58.8	54.3	40.4	58.7
Netherlands	81.4	78.4	81.6	69.7	79.5
Spain	67.6	63.3	60.1	47.8	63.2
UK	81.7	75.4	71.1	49.2	74.3

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Mothers' employment rates (2010)

Employment rates by status for mothers with children under 6

	Singles	Couples
France	73.2	76.1
Germany	68.6	69.3
Italy	74.1	56.5
Netherlands	69.3	79.7
Spain	72.1	60.4
UK	58.8	72.2
US	73.0	72.0

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Part-time employment (% of total; 2010)

Female part-time employment rate by presence of children under 6.

	0	1	2	+3	Total
Denmark*	24.4	23.0	24.7	26.6	24.3
France	20.9	26.7	36.9	47.5	29.0
Germany	31.8	59.5	74.3	78.3	47.6
Italy	22.6	32.7	37.1	40.2	29.4
Netherlands	55.3	82.4	89.2	91.1	74.0
Spain	17.1	24.2	29.7	30.2	22.9
UK	21.5	45.4	60.1	65.6	39.0
US**	10.1	15.8	-	23.6	14.6

Notes: *year 2005 **year 1999

Box 7.1 Mothers with young children in France

France 1986 policy to help parents raise children (APE):

- Allowance 40% of the median wage (60% of the net minimum wage) for mother of **at least 3** children, one of whom was younger than 3
- 1994: also for mothers of **at least 2** children, one of whom was younger than 3.
- Mothers entitled for the birth of their second child, provided he was **born after June 30, 1994**
- By 1997 every mother with one child younger than 3 was entitled to the benefit

Box 7.1 Piketty (1998)

Effect on employment rates of mothers living in a couple — younger than 55 years of age — period 1994–1997

Analysis as natural experiment:

- **1 treatment group:** 2 children — 1 child less than 3: not eligible before 1994 — eligible after
- **3 control groups:**
 - 1 child — less than 3 — not eligible before — not after
 - 3 children, 1 less than 3 — eligible before & after
 - 2 children, none less than 3 — not eligible before — not after

Box 7.1 Piketty (1998)

Employment rates (%)

Children	One Child (≤ 3 years)	Entitled to APE		March 1994	March 1997	Δ	$\Delta\Delta$
		Before 1994	After 1994				
2	yes	no	yes	59	47	-12	
1	yes	no	no	62	64	+2	-14
3	yes	yes	yes	31	34	+3	-15
2	no	no	no	68	69	+1	-13

Conclusion: expansion of the APE caused a drop in the employment rate of mothers involved.

Box 7.2 Child care and hours of work in Norway

- Norway: participation rate partnered mothers:
 - 75% if child < 3 years
 - 83% if child 3-6 years
- Cost of day-care centers shared by state, municipalities and parents
- 1998: cash benefits of approximately 400 Euro per month for parents with 1 year to 3-years old children who did not use state-subsidized day-care facilities
- Amount equivalent to state subsidy per child given to day-care centers
- Main reason: freedom of choice in child rearing (like a voucher)

Box 7.2 Child care and hours of work in Norway

Rules and regulations in Norway:

- Working parents 52 weeks maternity leave with 80% wage compensation (or 42 weeks with 100% compensation)
- Mother must take 9 weeks (3 before, 6 after), father must take 4 weeks — rest optional
- 1998 cash benefits (families with children 1–3 years):
 - Child 1-3 years: treatment group
 - Child 3-6 years: control group

Box 7.2 Naz (2004)

Weekly hours of work

	Children age 1 to 3			Children age 3 to 6			$\Delta\Delta$
	Before	After	Δ	Before	After	Δ	
Mother	24.4	23.7	-0.7	24.5	26.5	2.0	-2.7
Father	40.9	41.3	+0.4	40.8	40.8	0.0	+0.4
Total	65.3	65.0	-0.3	65.3	67.3	2.0	-2.3

Conclusion: Because of cash-benefits women reduced working hours, men's working hours not much affected

Policy issue 1

Can work and family life be balanced?

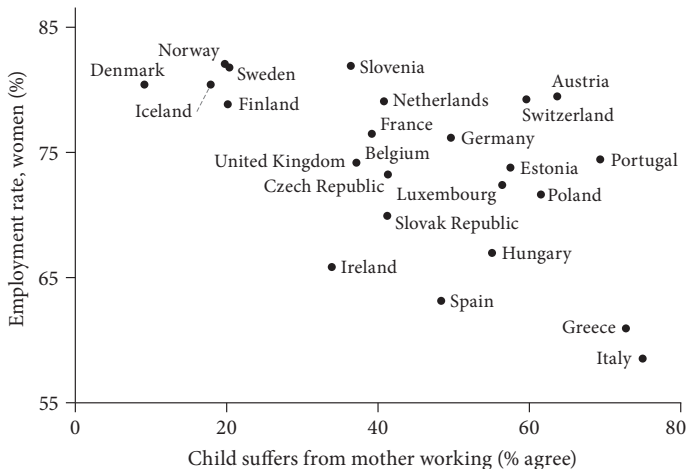
- Issue related to promotion of female employment rates
- It also touches upon the quality of childcare
- Answer depends on market power of firms
- Should governments subsidize cost of raising children without favoring market costs for childcare over the forgone earnings cost of a parent who stays home to care for a child?

Policy Issue 2: Should fertility be encouraged?

- Malthus Theory of Fertility: as incomes rise, families want more children (focus on income effect)
- But also substitution effect: an increase in the price of a person's time will increase the opportunity cost of rearing children when this person exits the market sector

Employment - Norms about Women Working

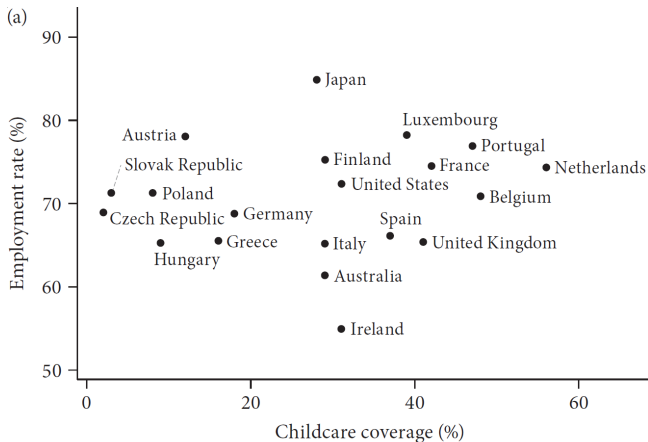
Cross-country (2001)



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Childcare coverage and employment (full time)

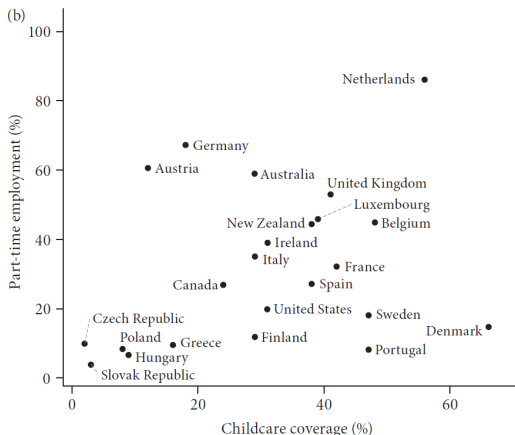
Childcare coverage for children younger than 3 years and employment of woman with at least one child.



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Childcare coverage and employment (part time)

Childcare coverage for children younger than 3 years and part-time employment as percentage of total employment of woman with at least one child.



Source: Ito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Overlaps with other institutions

- Payroll taxes
- Regulation of working hours

Why do family policies exist?

- Government intervenes - existence of imperfections in the market for childcare:
 - Imperfect information about the quality
 - May lead to moral hazard and adverse selection
- Subsidies targeted at high-quality childcare may induce parents to opt for this care
- Without subsidies level of childcare may be sub-optimal
- Externalities: high-quality childcare → lower costs to society because of more educated individuals

Review questions

- 1 Why could it be welfare improving if governments subsidize child care facilities?
- 2 How does parental leave affect employment and wages?
- 3 How could subsidies influence the choice between formal and informal child care?
- 4 For a long time economics was called the “dismal science” because of Malthus’ ideas. What is wrong with Malthus’ ideas?
- 5 How does childcare affect the reservation wage?

Exercise (I)

Consider a couple ranking purchased goods and services C and home-produced goods and services D as follows:

$$U = CD,$$

where D is produced via a decreasing returns-to-scale technology $f(h_d) = \sqrt{h_d}$, using as input time h_d devoted to home production as opposed to market work h . Suppose further that the individual can allocate 100 hours per week to either market work or home production.

Exercise (II)

- ① What is the optimal allocation of time between market and home production when the wage is 10 euros per hour?
- ② Suppose that now the couple has a child and, given the extra value of the time spent with the child, the joint utility becomes

$$U = CD^2.$$

At the same time, any hour spent away from the child involves a cost of 5 euros to be paid to a babysitter. How does this affect the allocation of time of the family?

- ③ Would your answer differ if home production technologies improve (e.g., as a result of the introduction of disposable diapers and microwave ovens), so that household production becomes $f(h_D) = h_D^8$?

The Variable-costs case(I)

Every hour of childcare costs c_c . Now the budget constraint is

$$c_3 = m + (w - c_c)h;$$

The budget constraint rotates. As the substitution effect dominates over the income effect, there is a reduction in hours of work, which may even lead mothers to exit the labor force. Symmetrically, a childcare subsidy will increase the net wage, having an ambiguous effect on hours of work. There is indeed a positive substitution effect and a negative income effect of the subsidy, if we assume that leisure is a normal good.

The Variable-costs case(II)

Formally, denoting by h^* the optimal choice of hours of work, the comparative statics of an increase in variable childcare costs is given by

$$\frac{\partial h^*}{\partial c_c} = \frac{\partial l}{\partial w} + \frac{\partial l}{\partial m} l_0,$$

where the first term on the right-hand side (the substitution effect) is negative and the second (the income effect) is positive. Notice that an increase in the childcare subsidy is equivalent to a reduction in c_c .

The Surplus from Home Production

Define by c total consumption and by c_d the consumption of goods and services generated domestically without monetary transaction. Home production uses the technology $c_d = f(h_d)$, where h_d is the amount of time devoted to home production. The total time allocation constraint is therefore $l_0 = l + h_m + h_d$ where h_m denotes hours of market work, and the budget constraint reads

$$c_m \leq wh_m + m,$$

where $c_m = c - c_d$ is the consumption in the marketed good. Substituting, we obtain

$$c + wl \leq m + wl_0 + [f(h_d) - wh_d].$$

The last term on the right-hand side denotes the surplus from home production.

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The Unitary and Collective Models of the Household

Consider a family composed of two individuals, indexed by 1 and 2. The unitary model of labor supply assumes that decisions about the labor-leisure trade-off are made maximizing a joint utility function of the type

$$U(c, l_1, l_2)$$

subject to $c + w_1 l_1 + w_2 l_2 = m_1 + m_2 + (w_1 + w_2)l_0$. What matters is uniquely the sum $m_1 + m_2$, as there is *income pooling* within the household.

The Collective Model of the Household

The collective model of the household instead assumes that decisions maximize

$$\max U(c_1, l_1)$$

subject to

$$U(c_2, l_2) \geq \bar{U}_2$$

$$c_1 + c_2 + w_1 l_1 + w_2 l_2 \leq m_1 + m_2 + (w_1 + w_2) l_0$$

where \bar{U}_2 is a given utility level.

The above problem can also be specified as

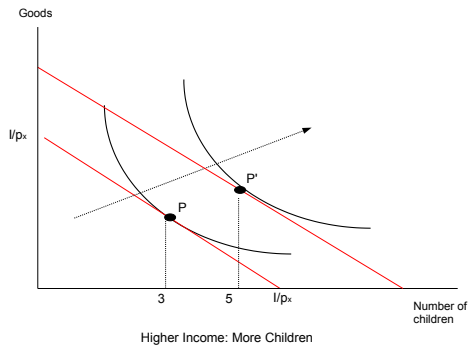
$$\max U(c_1, l_1)$$

subject to $c_1 + w_1 l_1 \leq \phi_1 + w_1 l_0$ where ϕ_1 is a sharing rule such that $\phi_1 + \phi_2 = m_1 + m_2$.

ADDITIONAL MATERIAL:

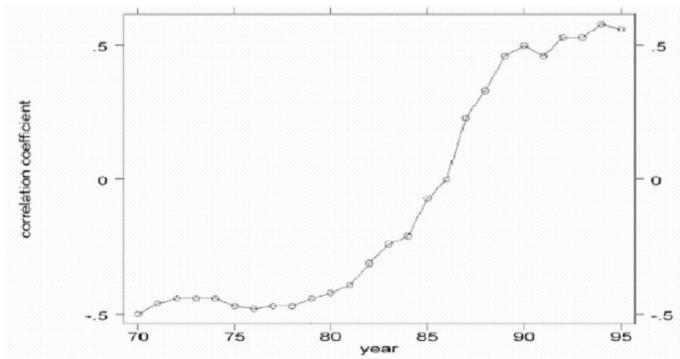
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Income effect (Malthus)



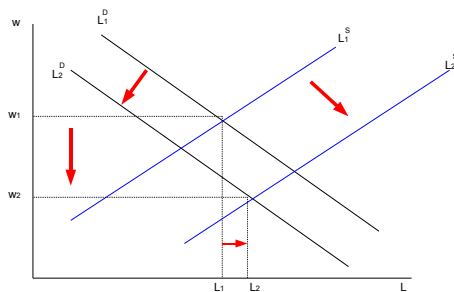
Change over time in the correlation work-fertility

Cross-country correlation between total fertility rate and female participation



Source: Brewster and Rindfuss (2000)

Income and leisure



◀ Employment - Fertility (2010)

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

November 2013

Tito Boeri and Jan van Ours (2013)

The Economics of Imperfect Labor Markets

Princeton University Press

Chapter 8. Education and training

What are we talking about?

- Human capital (and human cattle) theory
- Schooling and training: investments by individuals and firms → costs are paid in exchange for expected future benefit
- Formal schooling usually before individual enters the labor market
- Training usually after entrance into the labor market:
 - General
 - Firm-specific
- Focus literature on schooling: how much?
- Focus literature on training: who pays?

Market failures education and training

- ① Incomplete capital markets
- ② Private rates of return \Longleftrightarrow social rates of return
- ③ Long time lag between decision and outcome
- ④ Holdup problem: training agreements are non-contractible

Measures

- Organization formal education very country-specific
- Educational expenditures as % of GDP
- Training: difficult to measure
 - Participation rate
 - Annual volume
- PISA scores
 - Program for International Student Assessment
 - Survey of student knowledge and skills of 15-year-olds
 - Mathematics, science and reading

Educational expenditures & attainments

	Educational expenditures	Years of formal education		PISA Math score
		Men	Women	
Denmark	7.1	13.5	13.3	503
France	6.0	11.7	11.4	497
Germany	4.8	13.7	13.2	513
Italy	4.8	10.2	10.0	483
Netherlands	5.6	11.4	11.1	526
Spain	5.1	10.6	10.6	483
UK	5.7	12.7	12.4	492
US	7.2	13.2	13.4	487

Educational expenditures: % of GDP (2011)

Years of formal education: population 25-64 years (2011)

PISA: normalized to US score (2009)

Cross-country comparison schooling

- Substantial differences in spending level:
4.8% (Italy, Spain) \leftrightarrow 7.2% (US)
- Educational attainment wide variation:
10.2–10.0 (Italy) \leftrightarrow 13.2–13.4 (US)
- Positive but imperfect correlation between spending and educational attainment
- PISA math score (15 year olds):
Italy and Spain lowest score (483) \leftrightarrow Netherlands highest score (526)
- Teaching to the Test?

Employment rates by education (2011)

	Men			Women		
	1	2	3	1	2	3
Denmark	70.7	82.7	87.1	58.8	76.9	82.6
France	73.8	83.4	89.5	57.7	69.0	81.8
Germany	67.9	80.7	88.3	51.5	70.1	82.2
Italy	75.0	82.5	81.1	40.9	60.2	65.2
Netherlands	81.3	82.7	85.9	55.8	71.9	76.1
Spain	72.0	76.3	83.1	49.3	65.3	72.2
UK	56.2	83.9	86.3	34.2	71.2	78.7
US	59.6	72.9	80.5	42.8	64.8	75.2

1 = Less than upper secondary education

2 = Upper secondary education

3 = Tertiary education

Relative earnings – income from employment (2011)

	Men			Women		
	1	2	3	1	2	3
Denmark	94	100	155	96	100	148
France	88	100	159	81	100	146
Germany	79	100	130	63	100	128
Italy	74	100	162	78	100	147
Netherlands	72	100	126	89	100	136
Spain	68	100	115	62	100	145
UK	73	100	151	70	100	180
US	67	100	189	70	100	177

Notes: Year 2005 for France, Italy, UK and US.

1 = Less than upper secondary education

2 = Upper secondary education

3 = Tertiary education

Comment to tables on education and labour market outcomes

- Strong relationship between educational attainment and labor market status and earnings
- Wide cross-country variation in employment rates of low-educated men
56.2 (UK) \leftrightarrow 81.3 (Netherlands)
- Less variation among higher-educated men
81.1 (Italy) \leftrightarrow 83.4 (UK)
- Wide range in relationship between earnings and education; men
67–189 (US) \leftrightarrow 94–155 (Denmark)

Cross-country comparison employer sponsored training

	IALS data		ECVTS data	
	Participation rate (%)	Annual volume	Participation rate (%)	Annual volume
Denmark	45	36	53	22
France	–	–	46	17
Germany	–	–	31	9
Italy	14	8	26	8
Netherlands	24	21	41	15
Spain	–	–	25	11
UK	44	22	49	13
US	33	18	–	–

IALS = International Adult Literacy Survey – 1994–96

ECVTS = European Continuing Vocational Training Survey – 1999

Annual volume = hours per employed worker

Theory: Perfect LM – schooling

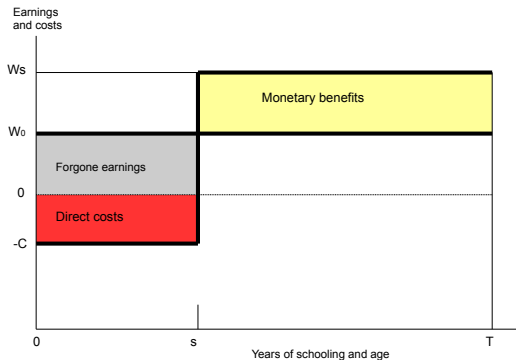
Basic assumption human capital model:

- ① More education \longrightarrow higher productivity
- ② Higher productivity \longrightarrow higher wage
- ③ Individuals' choice is based on financial considerations

Investment decision:

- Costs: direct expenses & forgone earnings
- Benefits: higher wage (and employment rate)

Graphical representation of schooling choice



► The Wage—Schooling Locus

► Optimal level of schooling Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

ILM: Schooling as a signal

- Education reveals a level of attainment which signals a workers qualifications to potential employers
- Education \rightarrow wage (but not via productivity)
- Information that is used to allocate a workers in the labor market is called a signal
- There could be a separating equilibrium
 - Low-productivity workers choose not to obtain \bar{s} years of education, voluntarily signaling their low productivity
 - High-productivity workers choose to get at least \bar{s} years of schooling and separate themselves from the pack

Signaling theory: numerical example

Cost of education differs:

- Less able: euro 25 s
- More able: euro 20 s

Lifetime Productivity - wage differs:

- Less able: euro 100
- More able: euro 240

What to do?

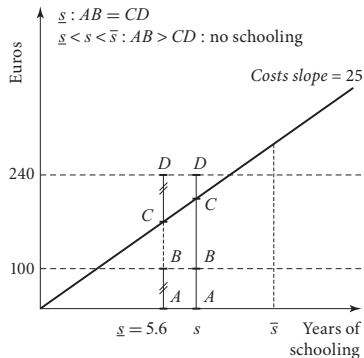
Choice threshold level of education such that less able chose lower educational attainment:

- less able: $100 > 240 - (25 * \bar{s})$ – so $\bar{s} > 5.6$
- more able: $100 < 240 - (20 * \bar{s})$ – so $\bar{s} < 7$

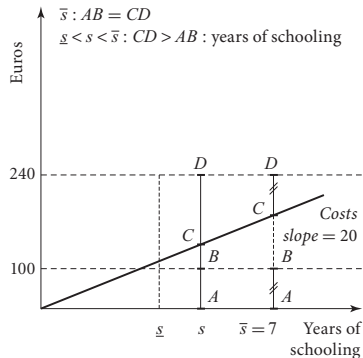
Conclusion $\bar{s} = 6$

Geometric illustration

(a) Low-productivity workers



(b) High-productivity workers



- ① $AB > CD \longrightarrow 0$ years of schooling
- ② $AB < CD \longrightarrow \bar{s}$ years of schooling

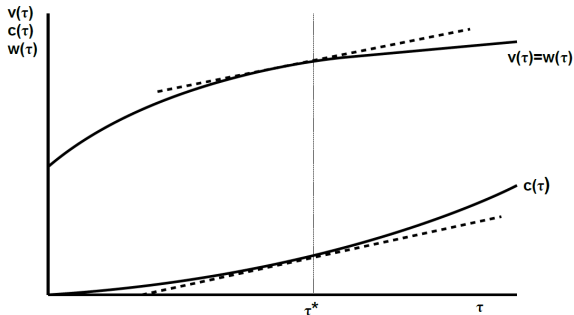
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Training in Perfect Labor Markets

Human capital theory → main issue: who pays for training?

- Traditional: workers pays general training – firm pays firm-specific training
- General training:
 - Increases productivity but diminishing returns
 - Training costs increase more than proportionally
 - Worker is paid according to productivity and chooses the optimal level of training maximizing revenue

The choice of the worker



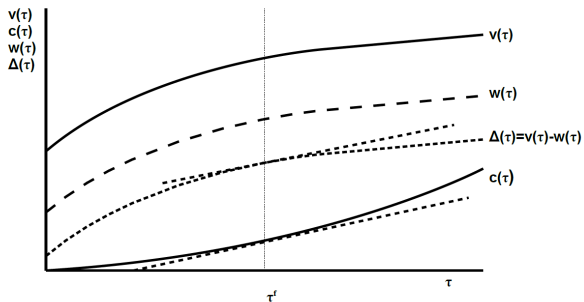
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Training in Imperfect Labor Markets

Alternative theory general training: non-competitive markets

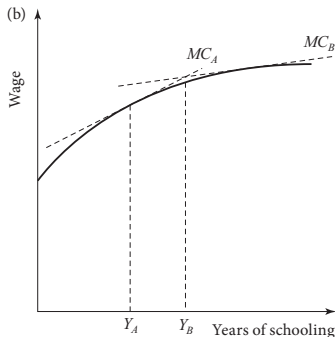
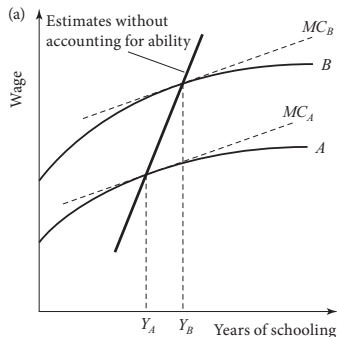
- Employers have **monopsony power**: worker is paid below productivity
- **Wage compression**: gap between wage and productivity increases with training
- Employers chooses the optimal level of training maximizing revenue
- Monopsony power: moving costs due to matching and search frictions, asymmetric information

The choice of the firm



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Selection problem: Schooling and earnings when workers have different abilities



(a) A and B face a different earning-schooling locus

(b) A and B face different cost of acquiring education

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The ability bias

- Observed data on earnings and schooling does not allow us to estimate returns to schooling
- In theory, a more able person gets more from an additional year of education
- Ability bias - the extent to which unobserved ability differences exist affects estimates on returns to schooling (since the ability difference may be the true source of the wage differential)

Box 8.2 Returns to schooling & identical twins

Ashenfelter and Rouse (1998)

- Correct for ability bias – sample of twins
- Annual Twinsburg Twins Festival (Ohio) → interviews 1991, 1992, 1993
- Sample: identical twins both of whom have held a job at some point in the previous 2 years
- Schooling difference: each twin reported on own schooling and sibling's schooling

Box 8.2 Returns to schooling & identical twins

Ashenfelter and Rouse (1998)

- Returns to schooling → percentage increase in wage due to 1 additional year of schooling
 - Account for differences in ability (more able → more education)
 - US sample of 340 twins
 - Direct estimate 10.2%
 - Twins: 8.8%
 - Ability bias: 1.4%

Causality: finding exogenous sources of variation in schooling

- Distance to school
- Season of birth \rightarrow variation in compulsory schooling age
- Vietnam War lottery: each day of the year \rightarrow random number; low numbers were drafted for the war \leftrightarrow high number not. Through going to college avoid having to go to war. Low numbers had this incentive \leftrightarrow high numbers not. Low numbers more schooling than high numbers (same ability)

Box 8.3 Estimating Returns to Schooling in the UK

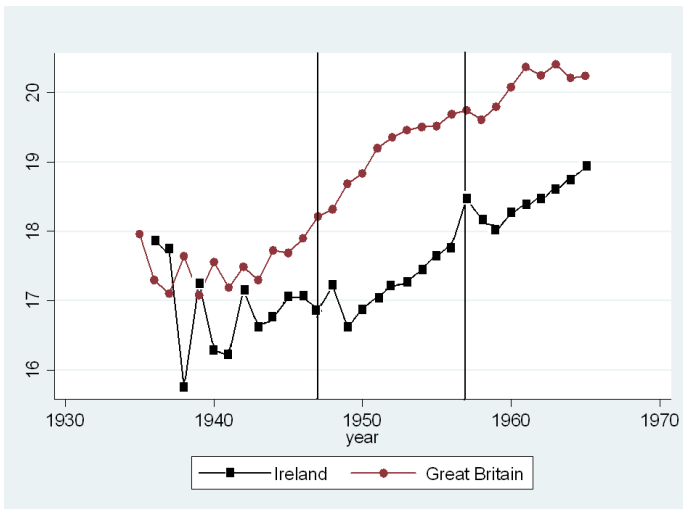
Oreopoulos (2006)

Correction of ability bias through variation compulsory schooling age in UK.

- Natural experiment:
- 1944: Education Act, minimum school-leaving age raised from 14 to 15 years old in England, Scotland, and Wales from 1947
- Control group: Northern Ireland (no change in compulsory school until 1957)

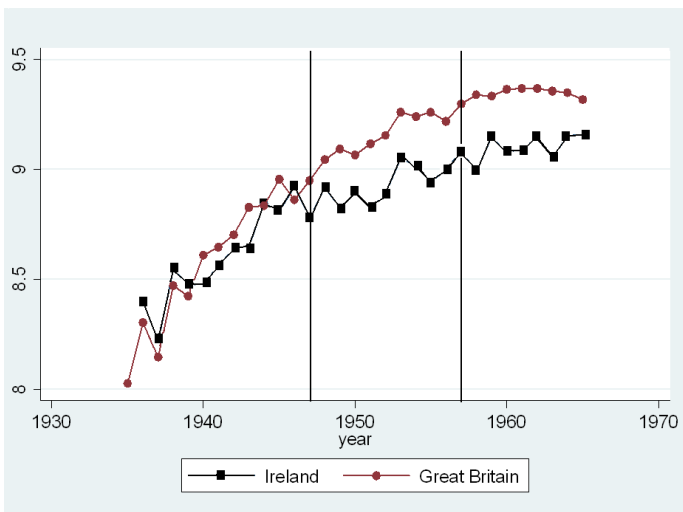
Box 8.3 Estimating Returns to Schooling in the UK

- Clear difference in educational attainments before and after the 1947 policy change.
- The difference is reduced after the same policy change was introduced in Northern Ireland in 1957.
- Estimates: 5.5-7.0 percent increase in earnings, in average, associated with raising compulsory schooling to age 15.
- Advantages of the study: very large fraction of the population reacted to the reform
- *"The benefits from compulsory schooling are very large whether these laws have an impact on a majority or minority of those exposed"*

Average age left full-time education by year aged 14 (*Great Britain and Northern Ireland*)

Note: The upper dark line shows the average age left full-time education by year aged 14 for British-born adults aged 32 to 64 from the 1983 to 1998 General Household Surveys. The lower line shows the same, but for adults in Northern Ireland.

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Average log annual earnings by year aged 14 (*Great Britain and Northern Ireland*)

Note: The upper dark line shows the average log annual earnings by year aged 14 for British-born adults aged 32 to 64 from the 1983 to 1998 General Household Surveys. The lower line shows the same, but for adults in Northern Ireland.

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Returns to schooling and non-cognitive abilities

Non-cognitive abilities (perseverance, motivation, risk aversion, self-control...) are as important as cognitive abilities (intelligence) in determining future earnings

- Heckman et al., 2001: evidence from GED program (second-chance schooling option given to people who previously dropped out)
- GED guys are as smart as all the others, but they earn **less!**

Implications:

- Both cognitive and non-cognitive abilities can be precisely measured
- They are not only genetically determined: they can be enhanced by investments made by family and society
- Life-cycle very important for their development

Box 8.4 On-the-job training in Germany

- Training in imperfect labor markets
- Germany: firms voluntarily offer apprenticeships to workers entering the labor market
- Firms that train have to follow prescribed curriculum
- Apprentices take rigorous outside exam at the end of their apprenticeship
- Training is monitored by worker councils
- Most of the skills acquired = general training

Box 8.4 On-the-job training in Germany

Acemoglu and Pischke (1998)

- Why do German firms do this → do they have monopsony power?
- Mobility of workers is restricted
- No direct investigation of training – in stead: focus on presence of adverse selection – **informational monopsony power**
- 3 cross-sections (1979, 1985-86, 1991-92) German Qualification and Career Survey
- Gross monthly wages

Box 8.4 On-the-job training in Germany

Acemoglu and Pischke (1998)

- Quits or layoffs signal low quality – exogenous separations can break informational monopsony power
- Military quitter: left apprenticeship firm immediately & mention military service as reason – unrelated to ability
- Relative to voluntary quitters wage increase
 - Stayers: 1.2%
 - Military quitters: 4.5%
- Military quitters earn more because they are separated for an exogenous reasons and therefore are perceived by market as of higher quality

Policy issue 1 – Should there be a compulsory schooling age?

- All OECD countries compulsory schooling age
- Is it welfare improving?
- Individuals may be shortsighted – too high discount rate – ignore future benefits (higher wages, lower unemployment)
- If social returns $>$ private returns: governments may step in and subsidize \rightarrow scholarships are welfare improving

Policy issue 2 – Should governments subsidize in-company training?

- Is it optimal from a welfare point of view?
- Deadweight loss?
- Answer depends on market power of firms
- Competitive market – employers reluctant to invest in training – if productivity goes up: social returns to training
- Social returns – based on gross wage; private returns – based on net wage
- If social returns $>$ private returns: governments may step in and subsidize

Does Competition increase School Quality?

- Causality Issue
- Number of districts/different schools related to school quality
- Identification based on the number of streams (Hoxby, 2000)
- Challenged by Rothstein (2007)

Overlaps with other institutions

- Payroll taxes: incentives to extend schooling & to attend training
- Unions: training
- Employment protection:
 - if not – no training
 - if too much – no training
- Retirement programs:
 - a longer working life increases the lifelong returns from education by enabling individuals to enjoy education premia for a longer time span
 - on-the-job-training may reduce the productivity losses typically associated with ageing, increasing the demand of older workers

Box 8.6 Pensions and Training

- 2006: Pension reform in Denmark
- Employees born before December 31, 1949 - retirement age: 62 years and 3 months (public sector);
- Employees born after 1950 - retirement age: 63 years old and 4 months;

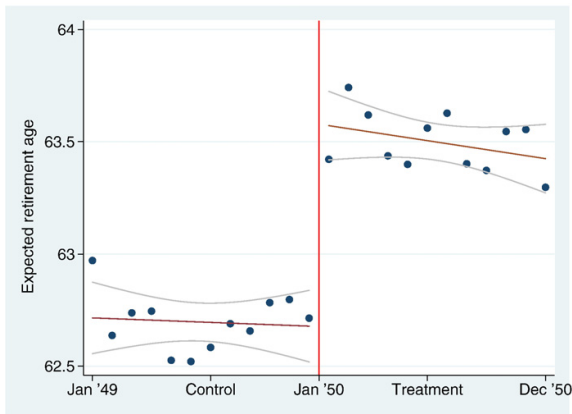
Box 8.6 Pensions and Training

Montizaan & Cörvers (2010)

- They matched employer (surveys) and employee (administrative from the pension fund) data for male employees in the public sector one year after the introduction of the new pension system.
- Training participation of employees born just after the treatment threshold (i.e., born in 1949) and those in the control group under the old system:

Box 8.6 Pensions and Training

Expected retirement age



Note: This figure presents the mean of the expected retirement age for each birth month from January 1949 to December 1950. Our sample consists of two birth year cohorts where employees born in 1949 are entitled to the old pension rules and employees born in 1950 are subject to the new pension rules. The vertical line marks the threshold which divides the control group from the treatment group.

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Box 8.6 Pensions and Training

Montizaan & Cörvers (2010)

	<i>Born in 1949</i>	<i>Born in 1950</i>	<i>Difference</i>
<i>Training participation in 2006</i>	<i>0.54</i>	<i>0.57</i>	<i>0.03</i>
<i>Training participation in 2005</i>	<i>0.50</i>	<i>0.50</i>	<i>0.00</i>

- Positive effect on the postponed retirement on training participation
- *"Workers in the treatment group participate approximately 7.3 percent more in long training courses than workers who were born in 1949"*

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Why do governments provide education and training?

- Having a higher educated population and a well-trained workforce has positive externalities – competitive asset
- Capital market imperfections → impossible or difficult to borrow → sub-optimal investments in human capital
- Investment in schooling and training → national income goes up

Technical Annex: Schooling decision – theory s or $s + 1$ year?

$$NPV_s = \sum_{t=0}^T \left(\frac{1}{1+i}\right)^t w_s = w_s + \sum_{t=1}^T \left(\frac{1}{1+i}\right)^t w_s$$

$$NPV_{s+1} = -C_s + \sum_{t=1}^T \left(\frac{1}{1+i}\right)^t w_{s+1}$$

The individual will attend another year of schooling as long as

$$\sum_{t=1}^T \left(\frac{1}{1+i}\right)^t (w_{s+1} - w_s) > w_s + C_s$$

Technical Annex: Schooling decision – theory s or $s + 1$ year?

if $C_S \approx 0$,

$$w_{S+1} - w_s = w_s i$$

So the previous condition becomes

$$w_{S+1} > w_s(1 + i)$$

So

$$\ln(w_{S+1}) > \ln(w_s) + \ln(1 + i) \approx \ln(w_s) + i$$

and therefore

$$\ln(w_{S+1}) - \ln(w_s) > i$$

Review questions

- 1 Why do firms pay for general training even though trained workers are valuable for other firms as well?
- 2 Why is it difficult to measure returns to schooling?
- 3 Why should not all students try to achieve an academic degree?
- 4 Does it matter for the schooling decisions of the individual to what degree schooling is a signal of innate productivity?
- 5 Should the state subsidize on-the-job training?

Exercise

Paola is about to decide which career path to pursue. She has narrowed her options to two alternatives. She can become either an economist or a concert pianist. Paola lives for two periods. In the first one, she gets an education. In the second, she works in the labor market. If Paola becomes an economist, she will spend 15,000 on education in the first period and earn 472,000 in the second. If she becomes a concert pianist, she will spend 40,000 on education in the first period and then earn 500,000 in the second. Suppose Paola can lend and borrow money at a 5 per cent annual rate.

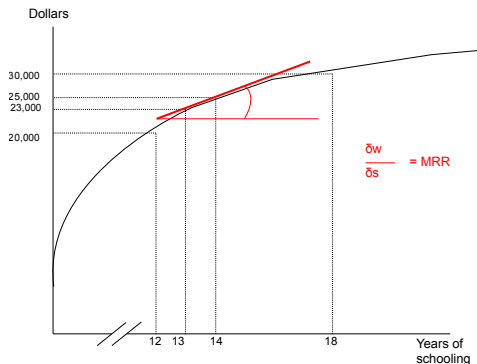
- 1 Which career will she pursue?
- 2 What if she can lend and borrow money at a 15 per cent interest rate? Will she choose a different option? Why?
- 3 Suppose musical conservatories raise their tuition so that it now costs Paola 60,000 to become a concert pianist. What career will Paola pursue if the discount rate is 5%?

ADDITIONAL MATERIAL:

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

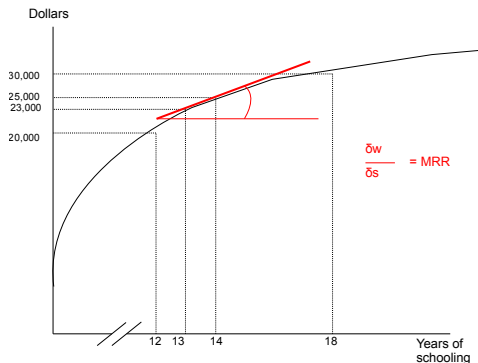
The Wage–Schooling Locus

The wage-schooling locus gives the salary that a particular worker would earn if he completed a particular level of schooling.



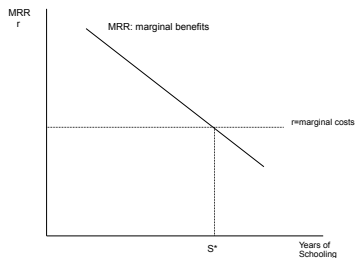
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The Wage–Schooling Locus II



from 12 to 13 years of schooling: \$ 3000 extra – MRR = \$ 3000 = 15% / year
 from 14 to 18 years of schooling: \$ 5000 extra – MRR = \$ 1250 / year = 5% / year

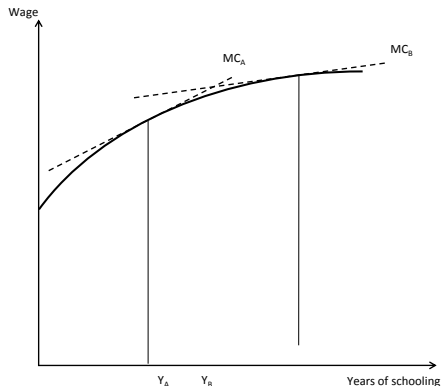
Optimal level of schooling



◀ Graphical representation of schooling choice

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Schooling and earnings when workers have different discount rates

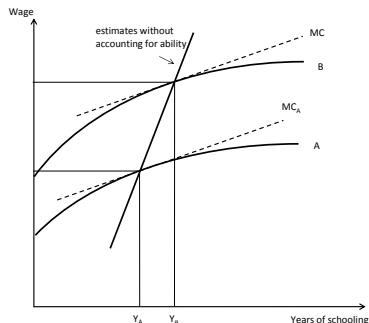


A and B have the same ability but face different discount rates

A is from a poor family, B from a rich family – A has fewer years of schooling

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

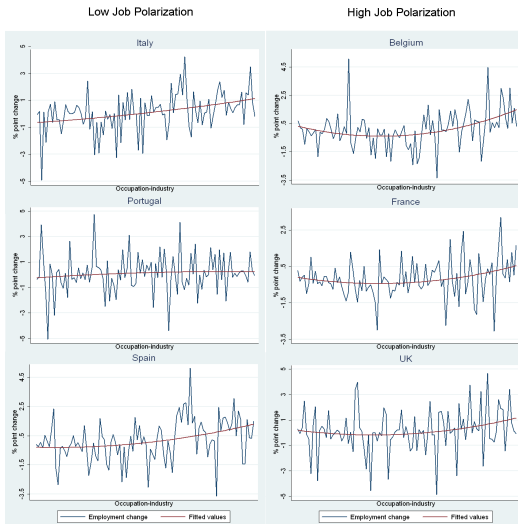
Schooling and earnings when workers have different abilities



A and B have the same discount rate (r), but each worker faces a different wage—schooling locus, i.e. has a different ability.

Job Polarization (JP)...

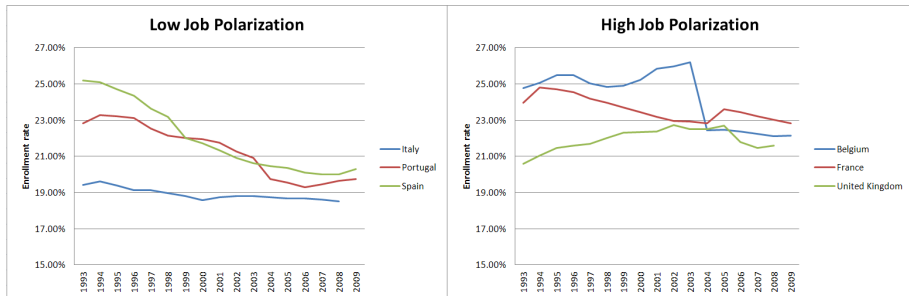
Job Polarization: increase in employment share of highest paid and lowest paid jobs and decrease in that of medium-wage ones.



Source: Ito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Y-axis: percent change in employment share. X-axis: interaction occupation-industry, from lowest to highest wage

...and Enrollment in Education (EE)



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The correlation between EE and JP

- Job Polarization: increase in employment share of highest paid and lowest paid jobs and decrease in that of medium-wage ones
- Is there a relationship between job polarization and enrollment rates?
- Evidence from Europe: different degrees of job polarization in the period 1993-2008
 - Overall decline in enrollment rates
 - Decline is more limited in countries with high degree of job polarization

◀ Box 8.4 On-the-job training in Germany

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

November 2013

Tito Boeri and Jan van Ours (2013)
The Economics of Imperfect Labor Markets
Princeton University Press

Chapter 9. Migration Policies

What are we talking about?

- Historically, about 60 million Europeans moved away from the Old Continent in 1820-1940: two-thirds of them went to the US
- Currently, Europe is attracting more migrants in proportion to its population than US
- In Europe, migration policies are getting stricter and stricter ...
- ... and a poor enforcement of these restrictions is giving rise to very large inflows of illegal migrants

What are we talking about?

Migration as great absentee in the era of globalization. Migration policies restrict the movement of persons across jurisdictions by establishing:

- Quotas in terms of maximum number of work permits
- Rules concerning the allocation of quotas, admission procedures and length of permits
- Years/Procedures to obtain citizenship
- Rules for asylum policies

Migration restrictions as perhaps the most controversial institution.
Perceptions vs. reality.

Box 1: Coming to America

According to Daniels (2002), the period 1820- 1920 is the “Century of Immigration”. Over 36 million migrants to US, predominantly from Germany, Italy, Poland, England and Scandinavia.

Unfettered immigration, but three phases of anti-immigrant activities:

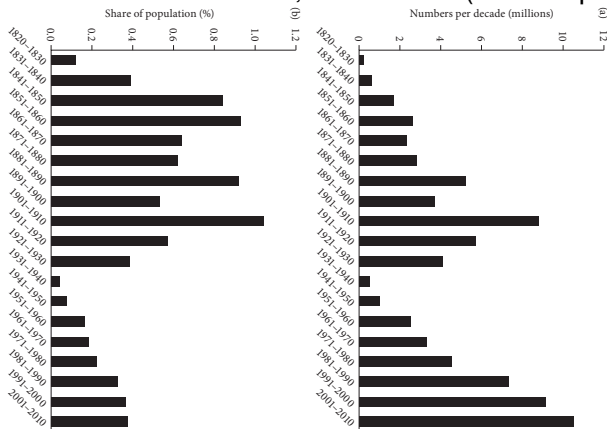
- Anti-Catholic
- Anti-Asian → Chinese Exclusion Act (1892)
- Anti-All immigrants → Quota system (1921), Immigration Act (1924)

Then

- 1965: New quota system abolishing national origins criteria; Reforms in the quota system in 1978 and 1990

Box 1: Coming to America

Immigration to the United States, 1820–2010 (millions per decade)



Migrant Integration Policies Index (MIPEx) (2010) & Strictness

	Migrant Integration Policy Index (2010)				Strictness Migration Policy (2005)
	Labor mobility	Family Reunion	Long-term residence	Access to nationality	
Australia	58	81	61	77	–
Austria	56	41	58	22	2.8
Belgium	53	68	79	69	–
Canada	81	89	63	74	–
Denmark	73	37	66	33	3.2
Estonia	51	65	67	16	–
Finland	71	70	58	57	2.8
France	49	52	46	59	1.5
Germany	77	60	50	59	2.6
Greece	50	49	56	57	2.7
Ireland	39	34	43	58	2.9
Italy	69	74	66	63	3.1
Japan	62	51	58	33	–
Netherlands	85	58	68	66	3.0
Norway	73	68	61	41	–
Portugal	94	91	69	82	3.1
Spain	84	85	78	39	3.2
Switzerland	53	40	41	36	–
Sweden	100	84	78	79	–
United Kingdom	55	54	31	59	2.9
United States	68	67	50	61	–

Source: MIPEx: www.mipex.eu; Strictness Migration Policy: www.frb.org

Source: Tilo Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Migrant Integration Policies Index (2010) & Strictness

- MIPEX: 0 = very unfavourable integration policies, 100= very favorable
- Most favorable labor market policies: Sweden, Portugal, Sweden, Netherlands, Spain, Canada.
- Unfavorable labor market policies: former Eastern European countries and Ireland.
- Family reunion most difficult in Ireland, easiest in Portugal.
- Long-term residence most difficult in UK, easiest in Belgium
- Access to nationality most difficult in Estonia, easiest for migrants in Portugal.

► Measuring the Strictness of Migration Policies

Not always so Strict

- Up to the 1950s migration encouraged in Europe
- Restrictive stance since the beginning of the 1970s together with rise of
- More migration to the US at the beginning of the 20th Century
- More restrictions = more illegals. Hard to measure illegal migration

► How to represent illegals

Perceptions vs. Reality

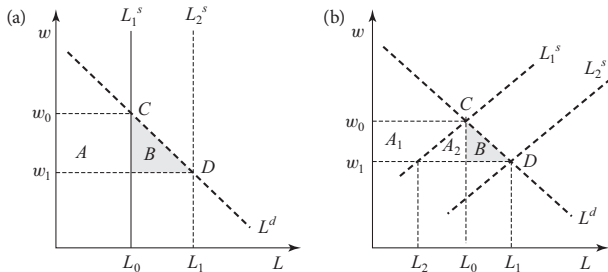
- Natives tend to overestimate number of migrants
- Negative perceptions increase during downturns
- Related not only to labor market, but also fiscal costs, crime rates and “amenity values”

► Deteriorating perceptions

A Competitive Labor Market

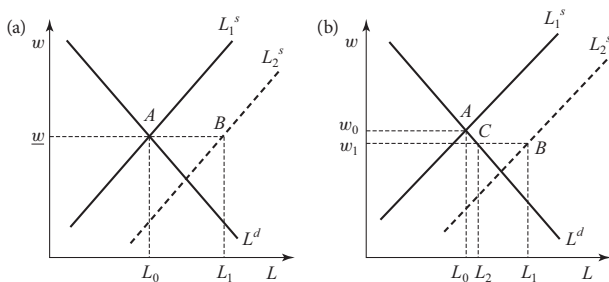
- Wages adjust fully to changes in labor supply. Focus on the short-run: no changes in the capital stock. Labor demand unaffected by immigration. Migration like labor supply shock
- Assuming that migrants and natives are perfect substitutes (homogeneous labor), the impact of immigration on employment depends on the elasticity of labor supply
- If labor supply is rigid, no effect on employment among natives
- If labor supply is elastic, employment among natives declines, but no unemployment

Immigration to competitive labor markets



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

An Economy with Wage Rigidities



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

In imperfect labor markets, migration involves unemployment

In imperfect labor markets, migration affects income of natives in a variety of ways:

- changes in wages
- changes in employment, and
- changes in unemployment
- taxes
- compositional amenities and other externalities related to U? (crime?)

Wage Rigidities and Unemployment Benefits

- There is also a fiscal effect of migration, insofar as immigration affects unemployment in the destination countries
- This *fiscal externality* is larger if labor is not homogeneous and unemployment benefits attract more low-skilled migrants, more likely to become unemployed or crowd-out low-skilled natives

Fiscal Effects: Main Channels

Negative fiscal externalities of migration related to:

- 1 Average net fiscal position of migrants: how much do they pay and how much do they get?
- 2 Welfare dependency : do they take more than what they are supposed to in light of their characteristics (age, number of children, labour market status, skill, income)?
- 3 Skill composition of migration: do countries with more generous systems attract migrants more likely to draw on welfare (low-skilled, with many dependent family members, etc.)?

What Drives Migration Decisions?

Migration as rational choice that involves two decisions:

- 1 *whether* to migrate
- 2 *where* to migrate

Decision as to *whether* to migrate

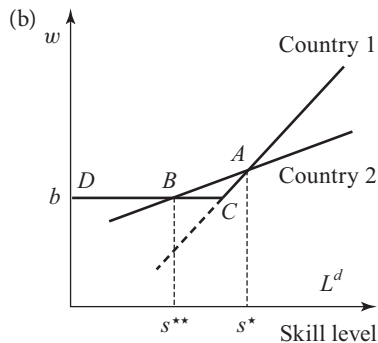
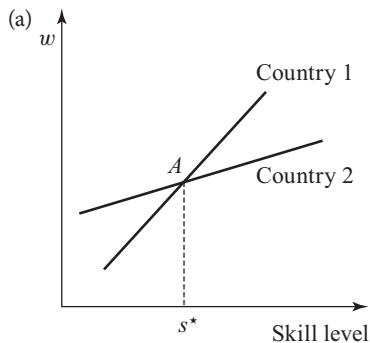
- Decision based on estimated discounted net present value (NPV) of migration

$$NPV = \frac{\sum_{t=1} w_F(t) - w_H(t)}{(1+i)^t} - C_0$$

Where:

- w_F = wage in the destination country
 - w_H = wage in the origin country
 - C_0 = front-loaded migration costs
- Determinants:
 - larger earning differential $w_F(t) - w_H(t)$
 - the lower migration costs
 - the longer the expected length of the working life
 - the lower the discount rate
- Analogies with theories of human capital

Migration and Self-selection: *where* to migrate



Migration and skills

- Skill composition of migrants depends on differences in rates of return of skilled and unskilled workers in the origin and destination region/country
- Highly educated end up in the country/region that values them the most
- Unemployment benefits creating income floor reduce skill content of migration

Effects on Income Distribution

- Immigration affects income distribution only insofar as migration affects the skill composition of the population
- If more low-skilled, income inequality increases
- If more high-skilled, income inequality declines
- However take into account potential skill downgrading of the highly skilled putting pressure on low-skilled workers

Determinants of Migration

Elasticity of East-West Migration w.r.t. East/West Unemployment and Wage			
	Age 18-24	Age 25-49	Age 50-64
Destination hourly wage	1.431	1.061	1.889
Source hourly wage	-0.803	-0.750	-0.102
Destination unemployment	-0.131	-0.259	-0.097
Source unemployment	-0.057	0.151	0.279

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Push and Pull Factors

Residential Choices of Power Couples in the United States, Costa and Kahn (2000)

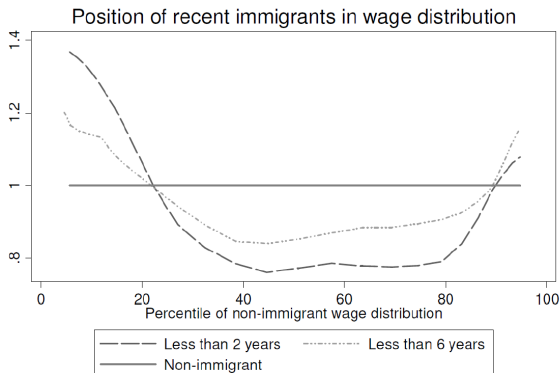
- Diff-in-Diff analysis to residential location of couples with different educational attainments (power couples: both partners with at least a college degree)

	1970	1990	Δ
Power couples	14.6	34.8	20.2
Nonpower couples	8.3	20.0	11.7
Difference	6.3	14.8	8.5

Effects on Employment and Wages

- Negligible effects of migration on wages and employment among natives
- This finding can be reconciled with economic theory when account is taken of
 - Self-selection of migrants in high-wage regions (greasing the wheels effect)
 - Changes in migration patterns of native workers
 - Changes in the regional output mix

Look at the entire Wage Distribution

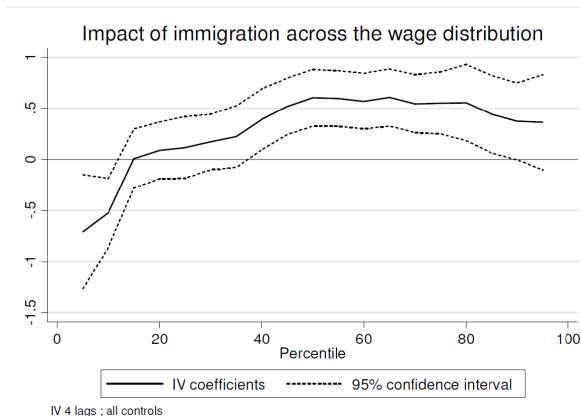


Source: LFS, various years

Source: Christian Dustmann and Ian Preston, 2011, Estimating the Effect of Immigration on Wages

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Look at the entire Wage Distribution



Source: Christian Dustmann and Ian Preston, 2011, Estimating the Effect of Immigration on Wages

Source: Tito Boeri and Jan van Ours (2013), The Economics of Imperfect Labor Markets, Princeton University Press.

How to Explain Positive Effect on Wages?

Educational downgrading of migrants (Dustmann and Preston). Insofar as natives and migrants are paid the same wage, and (more highly educated) migrants are more productive than (less educated) natives, a surplus is generated. It can be proxied by referring to wages of natives at the same educational attainment than migrants in that sector.

How about Employment/unemployment?

Employment and unemployment rates of native and foreign-born residents and share of foreign-born labor force, 2010 and 2009

Country	Employment rate %				Unemployment rate %				Labor force foreign% born %
	Men		Women		Men		Women		
	Native born	Foreign born	Native born	Foreign born	Native born	Foreign born	Native born	Foreign born	
Austria	77.9	73.5	67.9	59.8	3.8	8.8	3.6	7.6	16.3
Denmark	76.6	67.6	72.6	60.0	7.7	15.1	6.0	12.1	6.9
Finland	69.6	66.7	67.6	55.6	9.2	18.9	7.6	16.3	4.6
France	68.5	66.4	61.5	49.7	8.4	13.6	8.7	15.8	11.6
Germany	76.4	72.7	68.0	55.8	7.0	12.6	6.0	10.7	—
Greece	70.8	77.2	48.0	51.7	8.8	14.7	15.6	16.9	11.8
Ireland	63.9	65.4	56.5	54.4	16.5	19.2	8.8	12.6	19.0
Italy	66.7	76.3	45.6	49.8	7.3	9.7	9.1	13.2	11.3
Luxembourg	68.6	78.5	53.2	62.0	2.4	5.3	3.0	6.8	48.6
Netherlands	81.9	72.0	72.6	58.8	3.8	8.5	3.8	7.7	11.5
Portugal	69.7	74.3	60.8	64.5	10.2	12.7	12.0	17.2	9.4
Spain	65.6	60.0	52.0	53.8	17.3	31.1	19.1	26.7	18.5
United Kingdom	74.4	74.4	65.7	58.0	8.8	9.2	6.6	9.0	12.9
United States	68.2	77.4	62.2	57.4	10.9	10.0	8.7	9.5	16.2

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

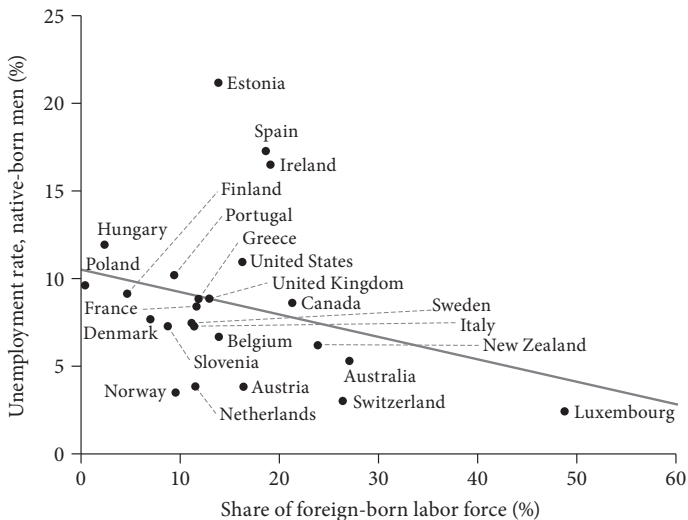


Figure: Share of foreign-born in the labor force and unemployment rates of native-born men

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

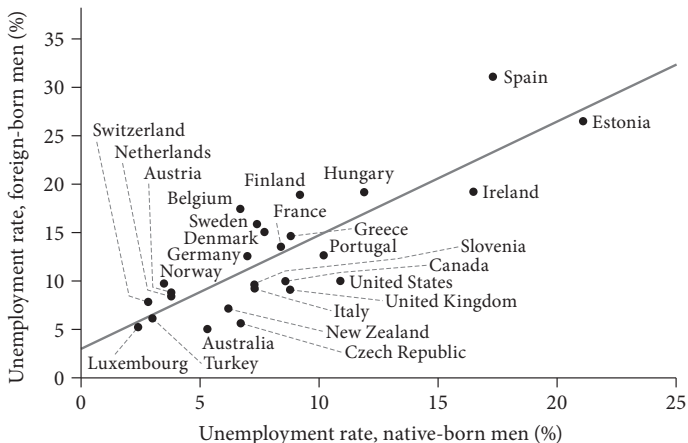
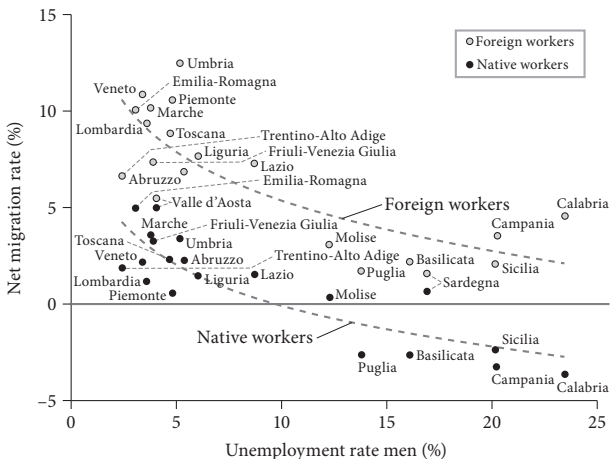


Figure: Unemployment rates of native-born men and foreign-born men

Explanations for limited effects: Greasing the Wheels Effect



Other explanations for limited effects on wages and employment

Also labour demand may react

- Immigrants may carry with them some capital (also immaterial)
- Changes in the composition of the skill mix increasing labor demand in immigration intensive sectors. In the case of Miami, relative growth of industries employing unskilled labor in the area
- Highly skill immigrants may downgrade upon arrival generating some surplus

Box 2: The Mariel Boatlift (Card, 1990)

- April 1980, Cuba: Castro declares that Cubans wishing to migrate were free to leave from the port of Mariel
- May - September 1980: 125,000 Cuban migrants arrive in Miami.
Increase of 7% in labor force

Effects on wages & unemployment?

Box 2: Effects on wages & unemployment?

- No effect on wages or unemployment...
- ... how was the Miami labor market able to absorb a 7% increase in labor force? Two possible answers:
 - 1 The Mariel displaced other immigrants and natives who would have moved to Miami had the Boatlift not occurred. In fact, no significant population growth in Miami wrt comparison cities
 - 2 The increase may have lead to a growth of industries that utilize relatively unskilled labor, but evidence shows little change in the relative importance of immigrant-intensive industries in Miami. Nevertheless, the Mariels may have simply replaced earlier cohorts of Cuban immigrants as the latter moved to more desirable jobs.

Box 3: The Mariel Boatlift That Did Not Happen (Angrist, 1990)

- Summer 1994, Cuba: tens of thousands of Cubans boarded boats destined to Miami in an attempt to emigrate to US in a 2nd Mariel Boatlift; the boat was diverted to Guantanamo Bay; only a small fractions of Cubans ever reached Miami
- Angrist and Krueger (1990), same research as Card for Mariel Boatlift, exploring the effect of a non-event.
- The treatment effect of the non-event on the unemployment rate of black workers was +6.3 percentage points.

	Unemployment rates			
	Blacks		Whites	
	Before	After	Before	After
Miami	10.1	13.7	4.9	3.9
Comparison cities	11.5	8.8	5.4	4.1
Δ	-1.4	+4.9	-0.5	-0.2
$\Delta\Delta$	+6.3		+0.3	

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Labor Market Performance of Migrants and Immigrant Children

- Convergence of migrants' wages to wages of natives
- Income convergence largely determined by human capital characteristics of migrants
- In terms of differences between children of immigrants and native-born children there are two types of countries:
 - Belgium, France, Germany UK: substantial differences in u rates
 - US, Switzerland, Australia: hardly any differences
- Differences in employment rate are mainly present among individuals with low education

Unemployment and Employment rates for children, native-born Vs. immigrants

	Unemployment rate				Employment rate			
	Men		Women		Men		Women	
Country	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Austria	6	-	5	-	90	81	79	66
Denmark	2	6	3	8	85	75	81	72
France	12	21	13	21	83	72	75	62
Germany	18	27	13	20	79	69	73	62
Netherlands	5	-	4	-	91	70	87	67
New Zeland	5	-	7	10	92	89	78	80
Spain	13	-	13	-	80	76	75	57
United Kingdom	9	15	7	10	82	79	75	66
United States	9	9	7	-	81	80	73	74

Notes: Population aged 20–29 and not in school or training.

(1) = children of natives; (2) = native-born children of immigrants.

Employment rate by educational level, native-born Vs. immigrants

	Men						Women					
	Low		Medium		High		Low		Medium		High	
Country	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Austria	87	71	92	90	96	-	56	-	80	74	88	-
Denmark	76	69	88	79	88	86	63	61	85	76	89	84
France	68	55	86	78	88	85	46	43	73	60	87	80
Germany	58	54	82	76	90	81	44	43	77	73	86	64
Netherlands	81	53	94	80	96	93	66	48	90	75	94	-
New Zealand	88	85	95	90	97	94	65	65	83	80	94	93
Spain	76	73	83	92	88	-	62	60	78	-	84	85
United Kingdom	71	61	89	80	92	90	44	28	77	66	92	86
United States	60	57	80	80	91	89	43	-	68	70	87	86

Notes: Population aged 20–29 and not in school or training. (1) = children of natives; (2) = native-born children of immigrants.

Closing the welfare door?

- Popular policy. It would address concerns of public opinion.
- ill-founded? ▶ Fiscal Effects
- It would affect the size of migration flows (increase by 1 stdev of generosity implies 3% higher migration) more than their skill composition
- Difficult to enforce: experience of California
- Problems in the assimilation of migrants
- Equity considerations

▶ Closing the Welfare Door?

Adopting a point system?

- Skilled migration is better for rigid countries
- Simplification of policies (including asylum)
- Is it effective in selecting migrants?
- Risk of brain drain?
- Equity considerations

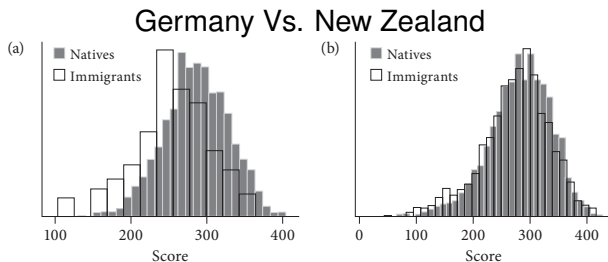
Brain Drain and Brain Gain: the Race for Talents

Bruecker et al., 2009

- Framework: countries compete for high-skilled migrants. Some are *senders*, others are *receivers*
- The pool of migrants is not given: higher skill premium and skill-selective immigration policies in the receiving country increase investments in education in sending country
- The outcome of the game depends on **social** returns to e. in sending country vs **private** returns to e. in receiving country
 - Migration does not reduce social surplus in sending country; however, it reduces positive externalities
 - An increase in international mobility may lead to a decrease in public spending in education...
 - ...up to a point below which skill level of migrants starts to fall.
- Results: inefficient outcome for Battle for Brains; even more so as the competition for talents becomes harsher

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Skill distribution of migrants and natives (IALS scores)



► Evidence on brain drain effects on LDC growth

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Migration policies are already getting selective

- Everywhere tightening of migration policies towards the unskilled
- While race to attract highly skilled migrants
- Explicit point systems in an increasing number of countries (Canada since 67, Australia since 84, New Zealand since 91, Switzerland since 96)

Why do Migration Policies Exist?

- Migration policies can, at best, induce some gradualism in migration flows that would otherwise occur in large waves.
- Pressures on welfare systems that exert negative fiscal spillovers on the domestic population can be reduced by either restricting access to welfare by migrants or by adopting explicitly selective migration policies

Review questions

- 1 Why do employers generally support migration, while unions do not?
- 2 What are the effects of migration on income distribution at home?
- 3 Why does empirical work often not find the strong effect of migration on native wages that is predicted by economic theory?
- 4 How do the elasticities of labor demand and labor supply affect the economic impact of migration?
- 5 What are the pros and cons of a points system?

Exercise 12 p. 271

Suppose that a worker with an annual discount rate of 10 percent resides in the Netherlands and is considering whether to stay there or to move to Italy. There are three work periods left in his working life, and pensions are independent of earnings. If the worker remains in the Netherlands, he will earn 40,000 euros per year in each of the three periods. If he moves to Italy, he will earn 44,000 in each of the three periods.

What is the highest cost of migration that the worker is willing to incur and still migrate?

ADDITIONAL MATERIAL:

Trends in migration policies

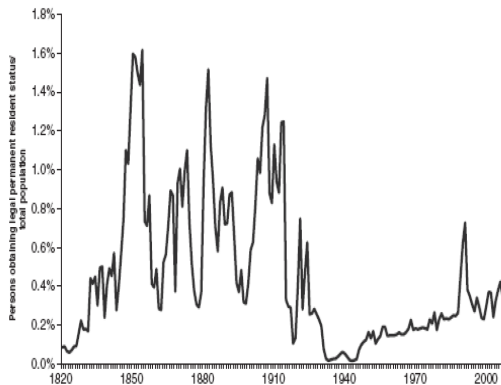


Figure 9.1 Gross Inflows of Legal Migrants to the United States as a Fraction of the U.S. Population, 1820–2007

Measuring the Strictness of Migration Policies

Quantitative indicator developed by www.frdb.org transforming qualitative information on scalar measure of strictness (higher scores denote more strict regulations). Draws on information on:

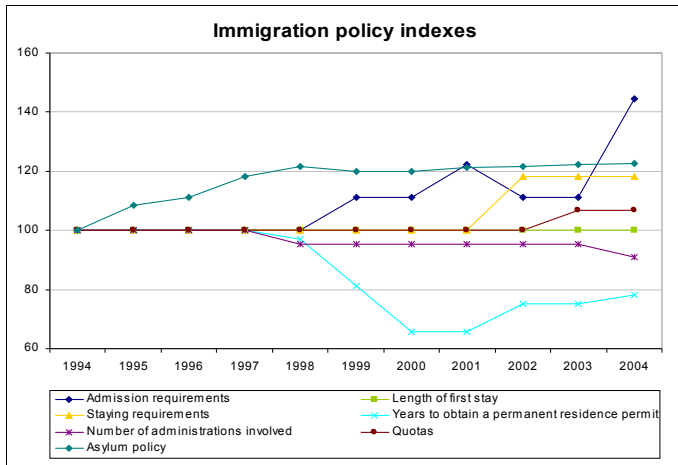
- Existence of Quota system
- Number of certificates and procedures required to be admitted as a foreigner
- Number of years required to obtain Permanent Residence
- Number of certificates required to legally reside in the territory
- Number of Years required to obtain first Residence Permit

Measuring the Strictness of Migration Policies

	Quota system	Years to obtain				Overall index
		Adm. req.	Perm. res.	Res. req.	Length first stay	
Austria	yes	5	5	3	2	2.8
Denmark	no	6	7	4	4	3.2
Finland	no	4	4	2	4	2.8
France	no	3	5	1	2	1.5
Germany	no	6	5	4	2	2.6
Greece	no	4	10	3	2	2.7
Ireland	no	6	10	3	2	2.9
Italy	yes	6	6	3	2	3.1
Netherlands	no	5	5	2	4	3.0
Portugal	yes	6	5/8	3	2	3.1
Spain	yes	6	5	2	2	3.2
UK	no	3	10/14	1	2	2.9

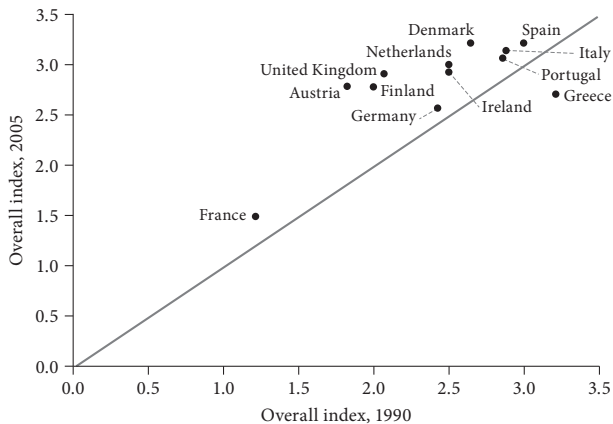
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Trends in migration policies



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

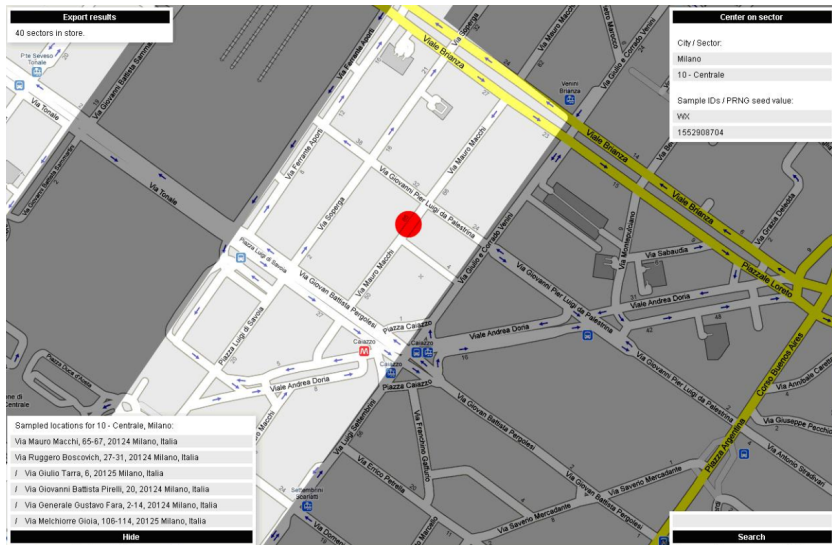
Relative country positions



◀ Migrant Integration Policies Index (MIPEX) (2010) & Strictness

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

How to represent Illegal Migrants



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Legal vs. Illegal Migrants

Results:

- Almost 20% of migrants do **not** report having a regular permit of stay
- Nonetheless, 66% of them work, with longer and harder working hours and often without any formal contract
- All the rest (education) being equal, being an illegal migrant lowers wages of 38.4%, with a further reduction of 17.1% for women

◀ Not always so Strict

Deteriorating Perceptions

% of respondents agreeing with the following statements		Germany	Spain	France	UK	Italy ⁽¹⁾
<i>"immigration bad for country's economy"</i>	ESS 2002	31	26	28	44	27
	ESS 2006	40	25	39	46	41
	2006-2002	9	-1	11	2	16
<i>"immigrants make country worse place to live"</i>	ESS 2002	34	37	37	42	42
	ESS 2006	42	36	42	47	54
	2006-2002	7	-1	5	5	14
<i>"unemployed immigrants should be made to leave"</i>	ESS 2002	50	25	32	53	49
	Harris 2009	67	71	51	78	79
	2009-2002	17	46	19	25	30

Notes: 1) The ESS survey took place in Italy only in 2002 and 2004.

Related to Campaigns against “Welfare Shopping”

- *Claus Hjort Frederiksen* (Danish Minister for Employment, 2006): “If immigration from Third World Country were blocked, 75% of the cuts necessary to maintain the welfare state would be unnecessary.”
- *Heinz-Christian Strache* (leader of FPO, Austria, 2009): “Social housing, family allowances and child subsidies should become a citizen’s right only and should not be given easily to immigrants.”
- *Thilo Sarazzin* (former Berlin central banker, 2010): “Germany is digging its own grave by admitting waves of immigrants who are spongers, welfare cheats, and sub-intelligent beings.”

Politicians Point to “Welfare Shopping”: more...

- *Roberto Maroni* (Italian Minister of Interior, 2010): “Migrants are a negative resource; we should not build houses (and religious sites) for them; it is outrageous that migrants acquire the same rights of Italians while only the latter pay.”
- *Siv Jenin* (Norwegian Progress Party): “There is a large number of immigrants living on welfare and they have been in this condition for a very, very long time.”
- *Catherine Megret* (French Front National, 2010): “There are simply too many immigrants, who knows how many children they send to the streets and then claim welfare.”
- *Kai Pontinen* (keyword in the 2009 campaign for European Parliament in Finland): “Stop to welfare bum immigrants”

Role of Compositional Amenities

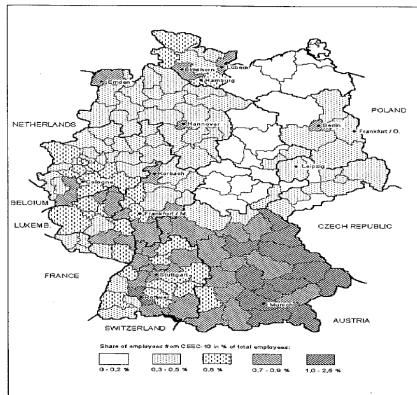
Card, Dustmann and Pearson, 2009

- Why do people usually oppose immigration but not trade, if the two policies have the same effect on wages?
- People value the "compositional amenities" associated with characteristics of neighbors and co-workers
- Immigration changes the **composition** of local population → externalities on natives
- Concerns over composition may be **more important** than concerns over taxes and wages!
- Concerns over composition higher among less-educated natives

◀ Perceptions vs. Reality

Local U matters

Germany: Regional Distribution of Employees from the CEECs

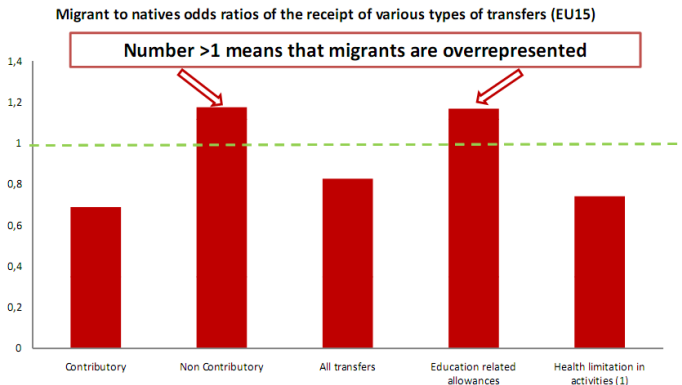


Source: Federal employment services, authors' calculations.

◀ Explanations for limited effects: Greasing the Wheels Effect

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Fiscal Effects (1): More likely than natives to be beneficiaries?



Source: EU-SILC (yearly averages, 2004-2007), pooled data.

Notes: (1): % of respondents declaring to have "limitation in activities people usually do because of health problems for at least the last 6 months"

Fiscal Effects (2): Race to the Bottom and the International Mobility of "Superstars"

Kleven, Landais and Saez, 2009: Analysis of effects of top earnings tax rates on **migration decisions of soccer players**

- Panel dataset: players from 14 European countries since 1980
- Sources of variation to achieve identification:
 - Bosman ruling (soccer market liberalization)
 - Within-country fiscal reforms
 - Country-specific tax discounts for immigrant soccer players
- Results: the level of top earnings tax rates has a **very large impact** on the migration decisions of football players
 - Particularly strong after 1995 Bosman ruling
 - Large impact of specific tax reductions for football players
 - Largest effect for young and top quality players

Closing the Welfare Door?

Perception about the fiscal position of migrants 0 they take out more;
10 they put in more)

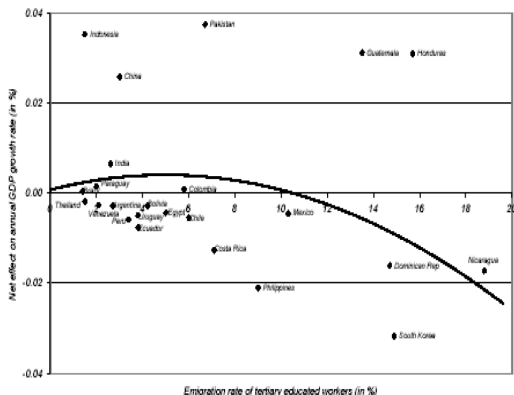
Country	Average reply	Take out more	Put in more	Std.Dev.
Denmark	4.1	4.6%	0.8%	2.12
France	4.4	8.9%	3.4%	2.34
Germany	3.8	8.5%	0.5%	2.06
Netherlands	4.2	6.1%	0.7%	2.08
Spain	4.7	2.2%	1.8%	2.09
UK	3.8	8.0%	0.6%	2.17

◀ Pros and cons of closing the welfare door

¹ Source: European Social Survey 2002

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Evidence on brain drain effects on LDC growth



Source: Docquier - Rappoport (2004)

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

November 2013

Tito Boeri and Jan van Ours (2013)

The Economics of Imperfect Labor Markets

Princeton University Press

Chapter 10. Employment Protection Legislation

EPL – What are we talking about?

- Set of norms and procedures followed in case of dismissal of redundant workers.
- Act as deterrent: protect workers with permanent contracts from the risk of early termination of their employment contract
- Decisions involve also third parties: legitimacy of a lay-off ultimately depends on court ruling

EPL – Measures

- Surveys of employers (possibly personnel managers of multinational firms) and workers (perceptions of security)
- Expert evaluations
- Country rankings of Employment Protection compiled by OECD, providing quantitative measures of qualitative features - two steps procedure:
 - ① Conversion of 18 indicators in 0-6 scores
 - ② Calculation of weighted averages of the scores in different areas
 - ① I. Individual dismissals of regular worker
 - ② II. Temporary work
 - ③ III. Collective dismissals

Individual dismissals of Regular workers

- A. Regular procedural inconveniences
 - ① Notification procedures (0-3): 0 = oral statement, 1 = written statement, 2 = notify third party, 3 = permission from third party
 - ② Delay to start of notice: some countries 1 day; others 1 month
- B. Difficulty of dismissal
 - ① Definition unfair dismissal (0-3): 0 = capability of worker or redundancy of job – 3 = capability cannot be the ground
 - ② Trial period before eligibility: 0 – 1 year
 - ③ Compensation after 20 years (if unfair dismissal – months of pay; 0 - 18 months)
 - ④ Extent of reinstatement (if unfair dismissal, right to return to job)
- C. Notice period and severance pay

EPL indicator regular employment

$$I = (A+B+C)$$

	1980s	1990s	2003	2008
Denmark	1.5	1.5	1.5	1.5
France	2.3	2.3	2.5	2.6
Germany	2.6	2.7	2.7	2.9
Italy	1.8	1.8	1.8	1.7
Netherlands	3.1	3.1	3.1	2.7
Spain	3.9	2.9	2.9	2.4
UK	0.9	0.9	1.1	1.2
US	0.2	0.2	0.2	0.6

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Individual dismissals of Temporary employment

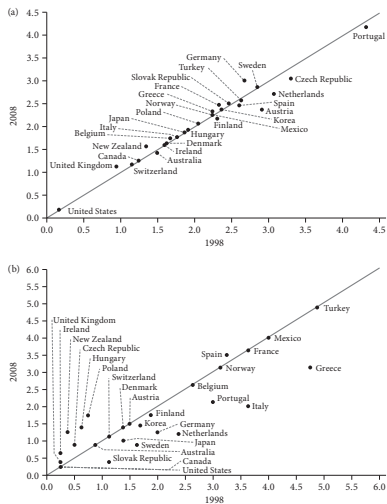
- ① Fixed term contracts
 - ① Valid cases other than the usual objective reasons
 - ② Maximum number of successive contracts
 - ③ Maximum cumulated duration
- ② Temporary work agencies
 - ① Types of work for which TWA is legal
 - ② Restrictions on number of renewals
 - ③ Maximum cumulative duration of TWA contracts

EPL indicator temporary employment

	1980s	1990s	2003	2008
Denmark	3.1	1.4	1.4	1.8
France	3.1	3.6	3.6	3.8
Germany	3.8	2.3	1.8	2.0
Italy	5.4	3.6	2.1	2.5
Netherlands	2.4	1.2	1.2	1.4
Spain	3.8	3.3	3.5	3.8
UK	0.3	0.3	0.4	0.3
US	0.3	0.3	0.3	0.3

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

EPL indicator: Regular and Temporary employment



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Collective dismissals

- ① Definition of collective dismissal (number of workers involved)
- ② Additional notification requirements
- ③ Additional delays
- ④ Other special costs to employers (social compensation plans)

III. EPL indicator collective dismissals

	1980s	1990s	2003	2008
Denmark	-	3.9	3.9	3.1
France	-	2.1	2.1	2.1
Germany	-	3.5	3.8	3.8
Italy	-	4.9	4.9	4.9
Netherlands	-	3.0	3.0	3.0
Spain	-	3.1	3.1	3.1
UK	-	2.9	2.9	2.9
US	-	2.9	2.9	2.9

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Overall EPL indicator

Without Collective dismissal

$$EPL_{overall} = \frac{EPL_{regular} + EPL_{temporary}}{2}$$

With Collective dismissal

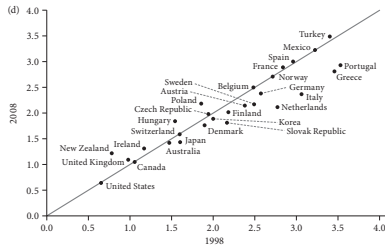
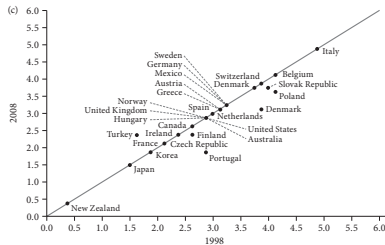
$$EPL_{overall} = \frac{5 * EPL_{regular} + 5 * EPL_{temporary} + 2 * EPL_{collective}}{12}$$

Overall EPL indicator

Without Collective dismissals				
	1980s	1990s	2003	2008
Denmark	2.3	1.4	1.4	1.65
France	2.7	3.0	3.0	3.2
Germany	3.2	2.5	2.2	2.45
Italy	3.6	2.7	1.9	2.1
Netherlands	2.7	2.1	2.1	2.05
Spain	3.8	2.9	3.1	3.1
UK	0.6	0.6	0.7	0.75
US	0.2	0.2	0.2	0.45
With Collective dismissals				
Denmark	–	1.8	1.8	1.9
France	–	2.8	2.9	3.0
Germany	–	2.6	2.5	2.6
Italy	–	3.1	2.4	2.6
Netherlands	–	2.3	2.3	2.2
Spain	–	3.0	3.1	3.1
UK	–	1.0	1.1	1.1
US	–	0.7	0.7	0.9

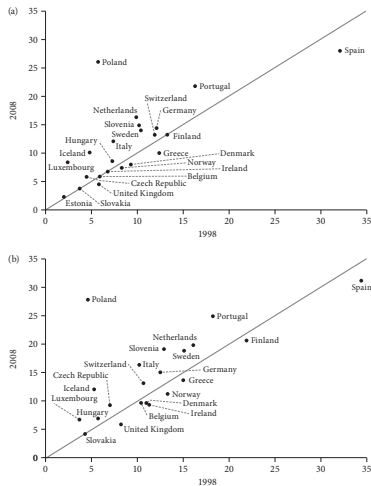
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

EPL indicator: Collective dismissals vs Overall



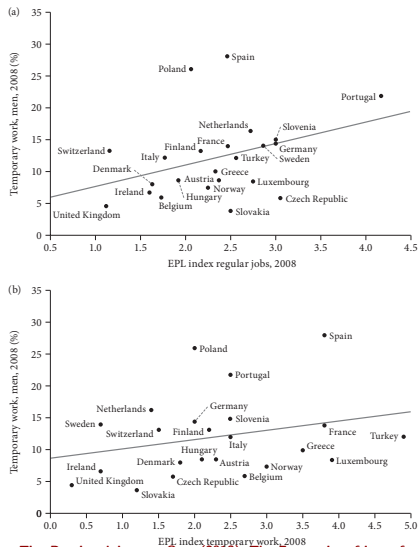
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Change in the percentage of temporary workers; 2000-2011



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

EPL index 2008 and male temporary employment 2008



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Shortcomings of this index

- Arbitrary weighting of the different components of employment protection
- Interactions among features: e.g., stricter EPL for regular contracts involves more use of temporary contracts
- Nothing on enforcement
 - Conciliation practices, length of the judicial procedure, percentage of rulings favorable to workers act as a threat to dismissals
 - We measure at best EPL, Employment Protection *Legislation*

Neglected Issues

- In some countries (e.g. Japan and US), more than *legal* provisions, there are *contractual* provisions
- Conciliation practices, length of the judicial procedure, percentage of rulings favorable to workers act as a threat to dismissals
- Difference between fair/unfair, economic/disciplinary
- Tenure-graded severance

► Compensation in different cases of dismissal

Stylized facts about reforms

- Some convergence in overall EPL
- Driven almost entirely by reforms of temporary contracts
- Dual track reforms: reforms at the margin – for new hires – while position of incumbent workers remains unchanged
- However inertia in country rankings

Economically relevant distinction

- 2 components of the EPL tax: Transfers (TR) from employers to employees and Deadweight Costs (C) to third parties, such as legal and procedural costs, jurisprudence, etc.
- $T = TR + C$
- TR can be negotiated, and hence **incorporated** (discounted) **ex-ante in wage contracts**
- while deadweight costs, C, cannot

A neutrality result if EPL is transfer

- competitive product market ($w=MP$)
- competitive labor market (no unions)
- flexible wages (no wage floors)
- risk-neutral agents ($u(w)=w$), interested only in average wages over the period

EPL has **no effect** on employment and wages. Contracted away.

BOX 1: Example of 2 period contract

- Suppose jobs last 2 periods and have marginal productivities MP in both periods
- Without EPL, in competitive labor market

$$w + \frac{w}{1+i} = MP(1 + \frac{1}{1+i})$$
- Introducing TR at 2, this can be offset by lowering entry wage by a bond B such that the following condition is satisfied

$$w - B + \frac{w+TR}{1+i} = w + \frac{w}{1+i}$$

EPL has **no effect** on employment and wages. Contracted away.

BOX 1: Intuition

- A mandated transfer from the employer to the worker can be undone by a **voluntary** transfer of the same size from the worker to the employer.
- Ex-ante same cost for the firm with and without EPL
- This works only if the employer succeeds in extracting a payment from the worker when the contract begins (the worker must be willing to pay the fee upon signing the contract)

BOX 1: Removing risk neutrality

- With **risk averse** workers: $u(w) > 0.5 * [u(w - B) + u(w + B)]$
- EPL will cause a welfare loss for workers
- Utility losses associated with income fluctuations
- Workers will ask for monetary compensations for this loss. Costs increase for the employers

With Rigid Wages

- Two countries both with rigid wages, but EPL only in Rigidland (R), not in Flexiland (F)
- Same technologies: $Y = A^i \log(L)$
- A^i can be A^H (good times) $>$ A^L (bad times)
- Probability p and $(1 - p)$ respectively
- Wages fixed at w

► Wage Deferrals, Tenure and Severance Payment

BOX 2: Wages and Employment Protection

The Efficiency wage model in a dynamic framework. the flow value of a job is: If the worker chooses not to shirk

$$\rho V_e^N = w - e + \delta(V_u - V_e^N)$$

Where w is the wage, e is the effort, δ is the (exogenous) separation rate and V_u is the value of unemployment

If she chooses to shirk

$$\rho V_e^S = w + (\delta + \phi)(V_u - V_e^S)$$

where ϕ is the probability that a shirker is detected and fired.

no-shirking condition:

$$w^e \geq \rho V_u + e \left(\frac{\phi + \rho + \delta}{\phi} \right)$$

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 3: Flexiland

- Choose L that maximizes $\pi^F = A^i \log(L) - wL$
- Implying $w = \frac{A^i}{L}$ or $L = \frac{A^i}{w}$ thus under good times higher employment
- Employment variations
- $\Delta L = \frac{(A^H - A^L)}{w}$ when from bad to good
- $\Delta L = -\frac{(A^H - A^L)}{w}$ when from good to bad
- Average $L^F = \frac{(pA^H + (1-p)A^L)}{w}$

BOX 3: Rigidland

- Adjustment of L too costly; firms choose average L and stick to it
- L maximizes $\pi^R = (pA^H + (1-p)A^L) \log(L) - wL$
- Implying $L^R = \frac{(pA^H + (1-p)A^L)}{w}$
- So: $L^R = L^F$
- Optimal employment is not affected by EPL
- Numerical example:
 - $A^H = 2000, A^L = 1000, w = 10, p = 0.5$
 - Then:
 - $L^H = 200, L^L = 100, L^R = 150$
 - But:
 - $\pi^F = 1801, \pi^R = 1764$
 - Profits in Flexiland 2.1% higher than in Rigidland

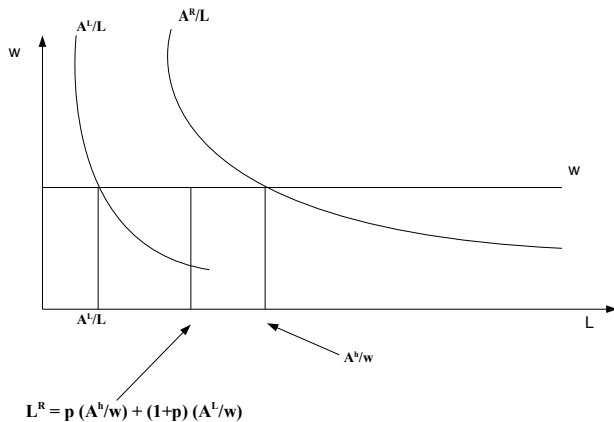


Figure 10.2 Employment in the Flexible and Rigid Regimes

Thus

- Average employment levels are the same
- More fluctuations in Flexiland than in Rigidland
- With risk-neutral agents, Flexiland is more efficient as under any state of the world, firms make higher profits
- But if workers are not risk-neutral, they are better off in Rigidland

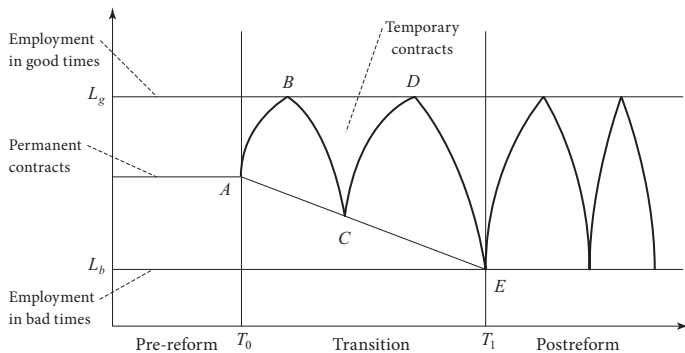
EPL as a tax

- Payment to a third party, say a lawyer
- Cannot be undone by bonding agreements
- Effects on both job creation and destruction as employers anticipate these costs when issuing a vacancy
- In general expected decline in both hiring and separations (**flows**) with ambiguous effects on employment/unemployment **stocks**

Two-tier systems

- Flexibility only at the margin
- A “buffer stock” of temporary contracts is created
- This has a transient and positive “honeymoon” effect on employment
- The effect fades away as permanent contracts can be fully replaced (e.g. via attrition) by temporary contracts

The Honeymoon Effect



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Another way to look at it

Example of two-tier reforms of EPL (Boeri and Garibaldi, 2007)

Evidence from cross country studies

Evidence from cross country studies (I)

Author(s)	Stocks		Flows	
	Employ.	Unemploy.	Employ.	Unemploy.
Emmerson(1988)	?	?	-	-
Bertola(1990)	?	?	?	-
Lazear(1990)	-	+		
Grubb and Wells(1993)	-			
Garibaldi, Koening, and Pissarides(1994)	?	?	?	-
Addison and Grosso(1996)	?	?		
Jackman, Layard, Nickell (1996)	?	?	-	-
Gregg and Manning(1997)	?	?		-
Boeri(1999)	?	?	+	-
Di Tella and McCulloch(1998)	-	+		
OECD(1998)	?	?	?	-
Krugler and StPaul(2000)			+	-
Belot and van Ours(2001)		-		
Nickell, Nunziata, and Ochel(2005)	?	?		

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Exploiting within-country variation

- Wide empirical literature on EPL is only cross-section
- While theory points to institutional interactions (e.g., EPL and wage bargaining) and within-country heterogeneity in coverage (e.g., EPL for regular and temporary employment)
- Need to exploit **natural experiments**
- Recent literature exploiting exemptions conditioned on **firm size**

BOX 4: “Natural experiment” in Italy – Boeri - Jimeno (2004)

- EPL conditional on firm size
- Thresholds scale **below** which the most restrictive regulations are not applied
- Italian firms with less than 15 employees are exempted for **Art. 18 of the Statuto dei Lavoratori**
- **Research:**
- Quarterly Labor Force Surveys (1994-6)
- Longitudinal and retrospective information (on employment levels and on dismissals): 80,000 individuals
- Size of firms declared by individuals

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 4: Difference in differences

Boeri - Jimeno (2004)

- Temporary vs permanent workers
- Firms: Above/below 15 employees.

Firm size	Probability of being dismissed (%)	
	Permanent workers	Temporary workers
Fewer than 15 employees	1.7	0.8
More than 15 employees	0.9	2.2
Δ	0.8	-1.4
$\Delta\Delta$	2.2	

► EPL & Temporary Employment

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 5: "Natural Experiment" in France – Behaghel et al. (2008)

- France: Tax for laying off workers aged 50+ (Delelande Tax)
- Because of the increase in firing costs, firms will refrain from hiring these workers
- July 1992: firms exempted from the tax for workers hired after age 50

BOX 5: Difference in differences

Behaghel et al. (2008)

- Workers aged 50 vs aged 49
- Before vs after policy intervention (July 1992)

Monthly transition from unemployment to employment				
	Men		Women	
Age workers	50	49	50	49
Before July 1992	1.21	1.43	0.88	1.13
After July 1992	1.25	0.93	0.99	0.93
Δ	0.04	-0.50	0.11	-0.20
$\Delta\Delta$	+0.54		+0.31	

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 6: "Natural Experiment" in Sweden – Olsson (2009)

- EPL and sickness absence in Sweden
- January 2001: exemption in the seniority rule → it made it possible for employers with < 10 employees to exempt 2 workers from seniority rule at times of redundancy
- Workers previously protected put at risk of dismissal
- Increasing risk of redundancy, especially for workers with high sickness absence

BOX 6: Difference in differences

Olsson (2009)

- Before vs after policy implementation (January 2001)
- Firms: Above/below 10 employees.

	Probability to be absent (%)	
	Treatment group	Control group
Firm size	2-9	12-50
2000	2.8	3.6
2001	2.4	3.6
Δ	-0.4	0.0
$\Delta\Delta$	-0.4	

► Ichino & Riphahn (2005)

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Endogeneity of EPL

- ① Enforcement of EPL is found to be correlated with unemployment
- ② Generally judges more protective of workers in depressed labor markets
- ③ Part of the effects of EPL on employment/unemployment may capture reverse causality

Possible endogeneity of EPL

- Many studies $EPL \uparrow \rightarrow \text{unemployment} \uparrow$
- Also possible $\text{unemployment} \uparrow \rightarrow EPL \uparrow$

Note:

- Enforcement of EPL is found to be correlated with unemployment
- Generally judges more protective of workers in depressed labor markets
- Part of the effects of EPL on employment/unemployment may capture reverse causality

Role models

- 1960s – Europe for the US: **high EPL**
- 1980s – US for Europe: **low EPL**
- Swedish model – active labor market policies
- Dutch model – reforming social security, cooperative unions, flexibility (part-time labor)
- Danish model – **flexicurity**; “Golden triangle”
 - ① Hiring and firing rules are flexible (**flexi**)
 - ② Unemployment insurance generous (**curity**)
 - ③ Activating unemployed workers

OECD Economic Survey Denmark

- 1990– “The **malfunctioning** of the labor market is at the core of the macroeconomic imbalances in the Danish economy”
- 2008– “... the flexible labor market, combined with active support for those losing jobs, makes a **good starting point** to benefit from globalization”
- Neither EPL nor UB changed – it was additional **activation**

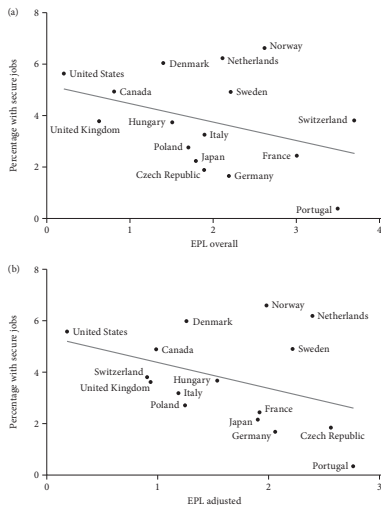
Policy issue – How much protection should EPL provide?

- Trade-offs in provision. Costs for job seekers and firms. Costs in terms of moral hazard-productivity. Also benefits:
- (privately) for the worker:
reduce income fluctuations protecting against un-insurable labor market risk; prevent wage underbidding by outsiders
- (privately) for the firm:
build-up of loyalty, trust and co-operation, induces workers to invest in specific technologies and reduces their resistance to new technologies (workers do not feel threatened)
- (socially) deterrent to opportunistic behavior:
firms: internalization of costs of bad management

Policy issue – Whom should EPL protect?

- Evidence of strong perceptions of job insecurity in the countries with the strictest EPL
- Selectivity of EPL: Protects only subset of workers concentrating risk on the others.

Perceptions of job security and strictness of EPL



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Policy issue – Should there be a single employment contract?

- To the extent there is a substantial flow from temporary jobs to permanent jobs, the dual labor market doesn't have long-lasting consequences for temporary workers.
- But it is possible that duality \equiv segmentation ...
- ... that is when there is a small probability to flow from temporary to permanent jobs.
- To reduce segmentation, single contracts have been advocated, in which EPL gradually increases with tenure.
- The idea is that there is no longer a distinction between temporary and permanent jobs; all jobs are quasi-permanent with EPL increasing with tenure.

Policy issue – Interactions with other institutions

- Trade-off EPL-UB (Unemployment Benefit System).
The political economy of flexicurity:
 - Insiders vs outsiders
 - High skilled vs low skilled
- EPL and Unions as complementary institutions
- EPL and Retirement Programs

Why does EPL exist?

- ① EPL is a strongly redistributive institution. It protects those who already have a job, notably a permanent contract in the formal sector.
- ② Unemployed individuals and workers with temporary contracts suffer in the presence of strict EPL for permanent contracts. The former experience longer unemployment spells, while the latter are caught in a secondary labor market of temporary contracts.
- ③ Employers suffer a loss in profits in the presence of EPL, notably when they do not succeed in making workers pay (through lower wages) for the costs of providing this insurance.

Review Questions

- 1 What are the main drawbacks of available measures of the strictness of EPL?
- 2 Why is there a non-monotonic relationship between EPL and unemployment?
- 3 What are the efficiency arguments in favor of employment protection?
- 4 Why do workers in countries with strict EPL feel less secure than workers in flexible labor markets?
- 5 Why are third parties (e.g., judges) involved in the enforcement of EPL?

Exercise 11 p. 304 (I)

Consider a country in which firms produce output (assumed to be the numeraire good) using labor L as the only production factor, with the technology $Y = f(A^i, L)$, where A^i is a parameter that fluctuates with the economy. It can take the value $A^b = 100$ in bad times, which occur with probability $2/3$, and the value $A^g = 300$ in good times, which occur with probability $1/3$. In the labor market wages are rigid and fixed to be $w = 10$. Assume no type of employment protection is in place in the country, so that firms can adjust their stock of labor at any time by hiring and firing workers at will.

Exercise 11 p. 304 (II)

Compute the equilibrium levels of employment, wages, and profits in good and bad times, and their averages, for each of the following specifications for the production function:

- $Y = A^i \log L$ Assume that employment protection is introduced: it is now unboundedly costly, for firms, to adjust the stock of labor.
- How do employment and wages change?
- Which of the two scenarios (no EPL versus EPL) is more profitable for firms?
- And by how much?
- Interpret these results.

ADDITIONAL MATERIAL:

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

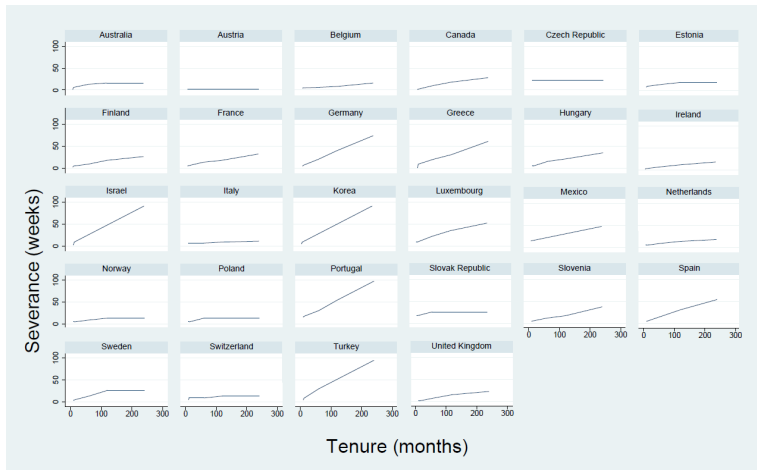
Compensation in different cases of dismissal

Country	Severance Economic at20y,Fair	Severance Disciplinary at20y,Fair	Typical Compens. at20y,Unfair	Maximum Notice, months	Reinstatem. Option	length of trial, first instance, months	Burden of Proof
Austria	0.00	0.00	6.00	4.00	3	4.29	e
Belgium	0.00	0.00	10.30	21.00	0	7.78	e
Denmark	3.00	0.00	6.60	6.00	1	6.63	w
France	5.40	0.00	16.00	2.00	0.5	9.12	w
Germany	10.00	0.00	15.50	7.00	1.5	6.65	e
Greece	8.00	0.00	Court	4.00	2	5.17	e
Italy	0.00	0.00	21.00	6.00	1	18.81	e
Netherlands	0.00	0.00	7.00	4.00	1	10.17	e
Portugal	12.00	0.00	20.00	2.50	2.5	14.15	e
Spain	12.00	0.00	24.00	0.50	0	9.07	e
Sweden	0.00	0.00	32.00	6.00	0	6.20	e
Switzerland	0.00	0.00	6.00	3.00	0	4.36	w
Turkey	20.00	0.00	10.00	2.00	0	7.05	e
United Kingdom	4.60	0.00	5.50	3.00	1	8.34	e
United States	0.00	0.00	Court	0.00	0.5	-	e

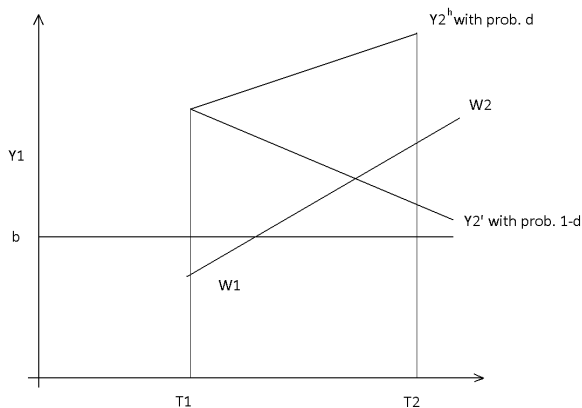
Sources: ^a EPLex; OECD (2008); Venn (2009); ^b CEPEJ (2012). Notes: Months. When notice period differs between categories of workers the longest period is chosen; Length of trial: Data from CEPEJ (2012) represent the average length of proceedings for employment dismissal cases at first instance courts for the latest year available; (OECD, 2008) represent the maximum legal length for this type of proceeding. π : probability that, in case of unfair dismissal, the judge opts for reinstatement (0.75 frequent, 0.25 rare, 0.5 intermediate cases);

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Severance Payments and Tenure



Wage Deferrals, Tenure and Severance Payment

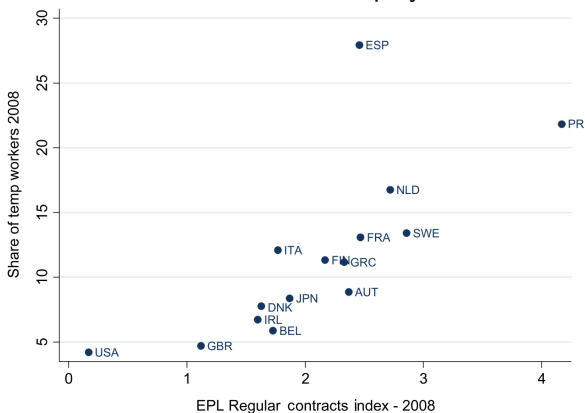


◀ With Rigid Wages

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

EPL & Temporary Employment

Strictness of EPL for Permanent Contracts and share of Temporary Contracts on Total Employment



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Two-tier wage structures: Premium of Permanent Contracts

$$\log w_i = \alpha + \beta_1 EDU_i + \beta_2 EDU_i^2 + \gamma_1 TEN_i + \gamma_2 TEN_i^2 + \mu PERM_i + \varepsilon_i$$

	Premium temporary-permanent μ	St. Err.	Obs.
Austria	20.1***	0.023	9867
Denmark	17.7***	0.015	8009
Finland	19.0***	0.011	8940
France	28.9***	0.016	15260
Germany	26.6***	0.010	25448
Ireland	17.8**	0.069	1583
Italy	24.1***	0.008	30177
Netherlands	35.4***	0.021	15845
Portugal	15.8***	0.016	7550
Spain	16.9***	0.007	22626
Sweden	44.7***	0.036	5412
United Kingdom	6.5*	0.037	7000

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Honeymoon effect and employment volatility

Estimating Okun's Law Betas: $\Delta e_t = \alpha + \beta \Delta y_t + \varepsilon_t$



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Pre-Reform EPL Strictness and Post-Reform Temporary Employment

Country	Time Period	EPL strictness (Regular Index)	EPL Strictness (Temporary Empl.)	Temporary Emp. Growth ΔET_t (000)	Contribution of Temporary Jobs $\Delta ET_t / E_0$
Belgium	1987-1996	1.68	4.63	22.7	0.66
	1997-2005	1.71	2.63	135.3	3.54
	Δ	0.03	-2.00	112.6	2.89
Italy	1987-1997	1.77	5.38	402.9	0.02
	1998-2005	1.77	2.82	823.2	4.11
	Δ	0	-2.56	420.3	4.09
The Netherlands	1987-1995	3.08	2.38	340.1	5.79
	1996-2005	3.06	1.45	288.8	3.80
	Δ	-0.02	-0.93	-51.3	-2
Portugal	1987-1996	4.56	3.34	-168.9	-4.10
	1997-2005	4.29	2.94	431.8	10.09
	Δ	-0.27	-0.40	600.6	14.19
Spain ¹	1981-1984	3.83	-	0	0
	1985-1995	3.67	3.66	3377.1	28.5
	Δ	-0.16	-	3377.1	28.5
Sweden	1987-1996	2.88	3.28	-138.9	-3.22
	1997-2005	2.86	1.63	189.2	4.82
	Δ	-0.02	-1.65	328.1	8.04

BOX 4: Difference in differences

¹ For Spain, 1981-1984, the EPL index is the overall index, as in Nickell (2006)

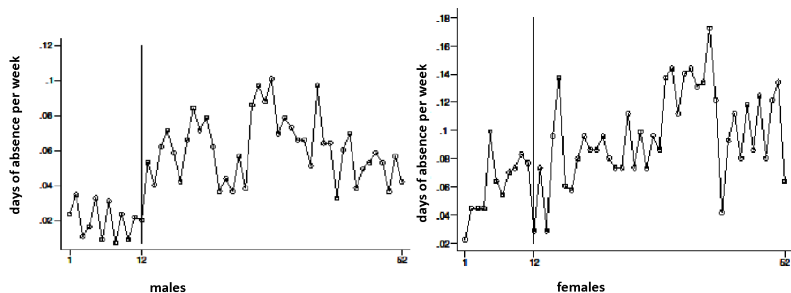
Ichino & Riphahn (2005)

- Effect on EPL on worker effort: absenteeism during and after probation
- Italian Bank: for 12 weeks, workers can be fired at will, after that protection from EPL
- EPL: if not sustained by “just cause” firm has to pay wage + penalty of 200%
- 545 men, 1993-1995 observed for 12 months

After 12 weeks: absence more than triples

- 1 Learning about social norms
- 2 Disincentive from EPL

Absenteeism during and after probation



◀ BOX 6: Difference in differences

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

November 2013

Tito Boeri and Jan van Ours (2013)
The Economics of Imperfect Labor Markets
Princeton University Press

Chapter 11. Unemployment Benefits

Unemployment benefits: What are we talking about?

- Unemployment benefits offer replacement income to workers experiencing unemployment spells. In principle should protect *job seekers* rather than *job holders* (as EPL, Chapter 10)
- The first UB system was introduced in the UK in 1911.
- Complex design to discourage opportunistic behavior
 - 1 Insurance
 - 2 Incentives

Multidimensional institution

Different features characterize a UB system:

- *Level* of the income transfer compared to the previous (future) wage
- Maximum *duration* for which they can be offered
- *Eligibility* conditions (conditions for access)
- *Entitlement* (rules for duration including sanctions after assessment of search intensity)

Measures of the generosity of UBs

Different features characterize a UB system:

- *Replacement rates*: subsidies as a fraction of the previous (backward looking) or potential (forward looking) earnings
- Replacement rate can be computed *net* or *gross* of taxes
- At different unemployment durations
- For different household characteristics

Unemployment insurance benefits, 2010

	Waiting period (days)	Maximum duration (months)	Payment rate (% of earnings base)		
			Initial	End	Note
Denmark	0	24	90	90	
France	7	24	57-75	57-75	
Germany	0	12	60	60	
Italy	7	8	60	50	
Netherlands	0	38	75	70	
Spain	0	24	70	60	
United Kingdom	3	6	10	10	FA
United States	0	23	53	53	

UI benefits for a 40-year old (where benefits are conditional on work history, the table assumes a long and uninterrupted employment record).

AW = Average Worker, who is defined as an adult full-time worker in the private sector whose wage earnings are equal to the average wage earnings of such workers

FA = Fixed amount in percentage of AW

Source: OECD (2010)

Net Replacement Rates for various earnings levels, family types, durations of unemployment, eligibility for housing benefits; 2010

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Denmark	94	95	76	75	77	75	64	64
France	70	73	67	71	81	67	52	67
Germany	75	77	70	72	88	61	62	72
Italy	68	73	53	70	77	62	0	69
Netherlands	85	84	62	76	80	76	72	80
Spain	75	75	53	74	84	60	33	75
United Kingdom	71	78	51	64	58	45	71	44
United States	52	61	38	50	72	48	37	45

Column (1) Baseline family: Earnings 100% of AW, 2 children, single-earner married couple, initial phase of unemployment but following any waiting period, eligible for social assistance “top-ups” and cash housing assistance. After tax.

Columns (2) to (8) differ from the baseline family in one dimension only:

(2) and (3): Earnings 67% and 150% of AW

(4) and (5): Single parent and two-earner married couple

(6): No children – (7): After 5 years of unemployment

(8): No social assistance “top-ups” or cash housing benefits are available in either the in-work of out-of-work situation

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Replacement rates

”Summary measure of benefit generosity”
(OECD, Jobs Study): average of replacement rates in the first two years of unemployment for Average Production Worker (APW) with seniority sufficiently long to yield maximum duration of UBs

Shortcomings of replacement rate measures

- Neglect the coverage of the subsidies (fraction of unemployed receiving the benefit)
- However coverage is partly endogenous (% of youngsters, without work experience)
- Do not consider the entitlement conditions (categorical vs. means-tested)

Adjusting for Coverage

Net Replacement Rates – OECD summary measure of benefit entitlements, 2010

	OECD Summary measure (1)	Coverage of UBs (2)	Adjusted Summary Measure (3)=(1)*(2)
Denmark	40.1	1.00	40.1
Germany	43.9	0.74	32.7
Italy	23.4	0.25	5.8
Spain	42.9	0.35	14.9
United Kingdom	29.3	1.00	29.3

Unemployment Insurance principle component

- Benefit depends on payments during past work experience
- Offers provisions proportional to past earnings
- The length of the entitlement period is dependent on the length of the contribution period (but not always).
- Some experience-rating (e.g., in the US) with employers paying more if they use it

Unemployment Assistance (UA) component of UB

- Accessible independently of (if any) payments during the past working experience
- Flat subsidy: provisions independent of past earnings
- Entitlement not conditional on the length of the contribution period
- Often means-tested

UBs often operate in connection with..

Non-employment benefits (other income transfers to non-employed individuals in working age) such as:

- Social assistance of the last resort (different from unemployment assistance)
- Early retirement (Chapter 6)
- Liberal access to disability benefits
- Sickness benefits

Summarizing evolution of UBs

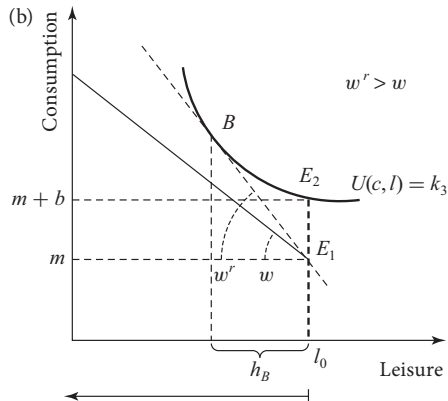
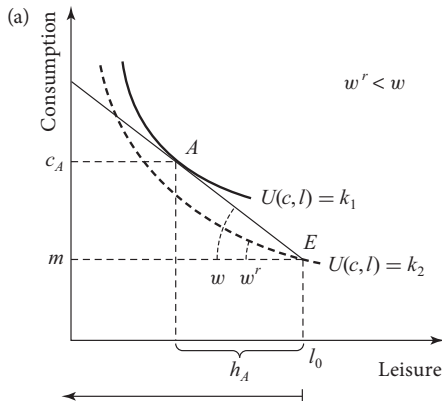
- Increasing generosity up to the 1980s, especially in Europe. Leveling off or small decline in the 1990s
- Net replacement rate on average 2/3 higher than gross
- Increasing sanctions for refusal of jobs or ALMP
- Relatively low coverage notably in Southern Europe

Theory: A Competitive Labor Market

Effects on individual labour supply

- Labor/leisure choice affected by non-work income
- Budget constraint with *spike* in correspondence to 0 earnings
- Substitution effect discourages work
- Negative net wage at low hours
- Increase in the reservation wage of unemployed benefit *recipients*

Static reservation wage



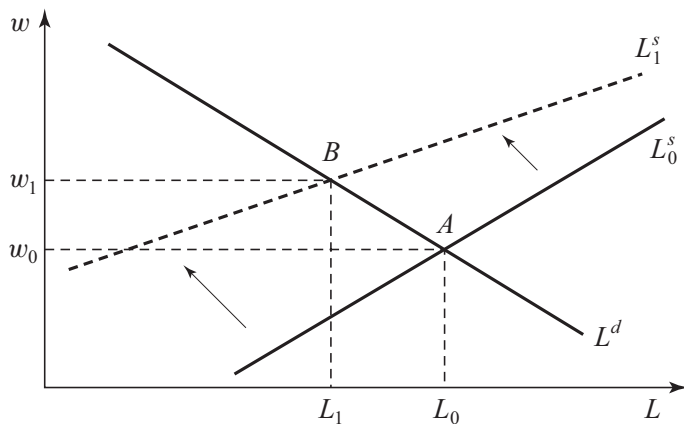
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 1: Static Reservation Wage and UB

- w^r as marginal rate of substitution between leisure and consumption: $\frac{U_l(m, l_0)}{U_c(m, l_0)} = w^r$
- Without UB:
 - For any $w > w^r$: $h_A > 0$
 - If $w < w^r$: $h_A = 0$
- With $UB=b$, non-labor income becomes $m + b$
 - w^r given by $U(m + b, l_0) = U(m + w^r h_B, l_0 - h_B)$
 - Therefore $\uparrow b \rightarrow \uparrow w^r$

Effects on the Aggregate Labor Supply

L^s shifts upwards: Higher wage ($\uparrow w$) and lower employment ($\downarrow L$)

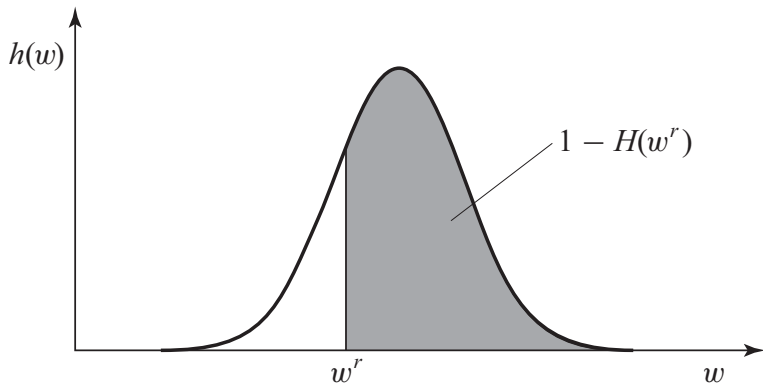


BOX 2: Imperfect Labor Markets – Dynamic reservation wage

Search Theory

- Imperfect information about vacancies and jobs (wages)
- Searching for a wage – wage distribution is known, NOT the exact wage
- Looking for a job is a productive activity
- Trade off: better job, but expensive to search
- Dynamic reservation wage: makes the worker indifferent between continuing to search or accept the job offer
- Reservation wage depends on costs (lower when UBs are present) and benefits: higher wage
- Unlike static reservation wage separates **unemployment** from employment

Dynamic Reservation Wages



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 3: Efficiency Wages and UBs

No-shirking condition implies:

$$w^e \geq \rho V_u + e\left(\frac{\phi + \rho + \delta}{\phi}\right)$$

the flow value of unemployment is increasing with b ,

$$\rho V_u = b + \mu(V_e - V_u)$$

And after some algebra

$$w^e \geq b + e\left(\frac{\rho + \frac{\delta}{u} + \phi}{\phi}\right)$$

Imperfect Labor Markets– 4 effects

- 1 *Job search effect* (increase reservation wage)
- 2 *Wage effect* (increase wages through improvement of bargaining position or through an increase in efficiency wage)
- 3 *Entitlement effect* (increase in participation of those not receiving UBs)
- 4 (*Tax effect*) (Chapter 13) related to funding of UBs

Job search effect

- Job seekers become more choosy. Longer duration of unemployment among UB recipients.
- They only accept job offers involving a higher wage
- This higher (dynamic) reservation wage discriminates between **unemployment and inactivity** (unlike the static reservation wage separating **employment and non-employment**)

Wage effect

- Higher outside option of workers at the bargaining table (**bargaining** effect)
- Higher wage is required to deter shirking (“**efficiency wage**” effect).
The penalty associated with unemployment is reduced in presence of UBs

Entitlement effect

- UBs increase the value of employment
- More participation in the labor market (shifts across participation margins)
- Lower reservation wage of job seekers not receiving UBs. Higher job finding rates of unemployed not eligible to UBs.

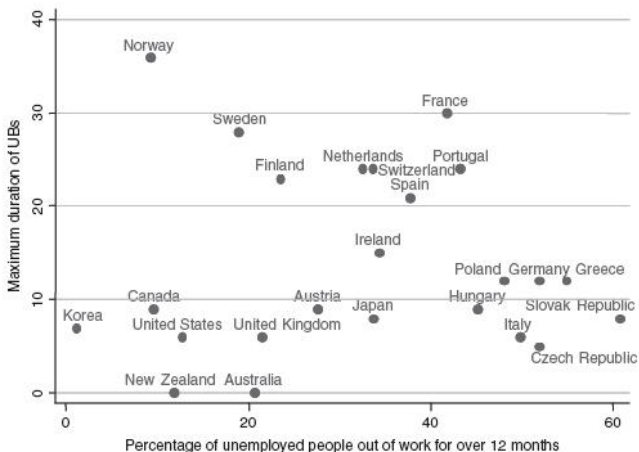
Empirical evidence

- Receipt of benefits increase reported reservation wages
- Longer duration of benefits correlated with longer duration of unemployment
- Unemployment outflows increase in proximity of the maximum duration of benefits
- Presence of spillovers between recipients and non-recipients of UB: also labor supply enhancing effects (as predicted by “entitlement” effect)

UB and unemployment duration

- Level of benefits - elasticity w.r.t. duration
 - Layard et al. (1991) 0.2-0.9
 - Carling et al. (2001) Sweden: 1.7
 - Roed and Zhang (2003) Norway: 0.4-0.9
 - Lalive et al. (2006) Austria: 0.4
- Potential benefit duration 1 week longer – actual unemployment longer by
 - Katz and Meyer (1990) US: 0.20 weeks
 - Ham et al. (1998) Czech-Slovak Republics: 0.3-0.9 weeks
 - Van Ours and Vodopivec (2006) Slovenia: 0.2-0.6 weeks more
 - Lalive et al. (2006) Austria: 0.1 weeks

Maximum duration UB vs percentage unemployed



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

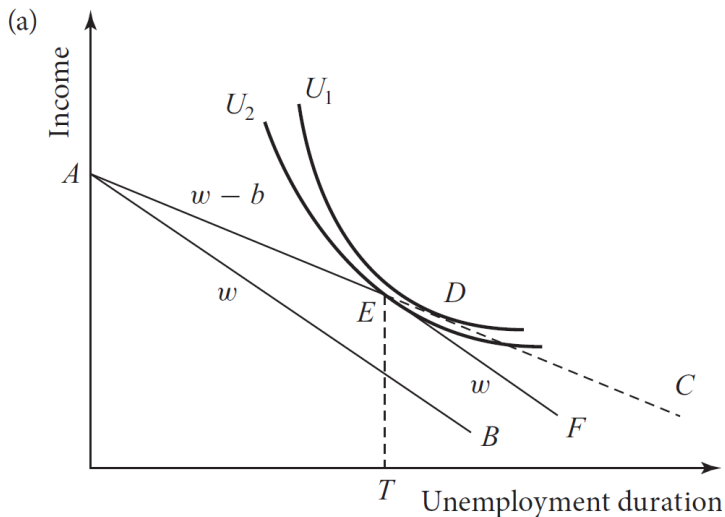
Unemployment hazard rates

- The hazard rate, λ , is the conditional probability of leaving unemployment – the probability that an individual leaves unemployment in the 10th week given that she has been U for 9 weeks
- If constant, then the (unconditional) probability of leaving unemployment in the 10th week = $\lambda(1 - \lambda)^9$ where λ is the hazard rate – also: “exit rate” or “job finding rate”

BOX 4: End-of-Benefit Spikes

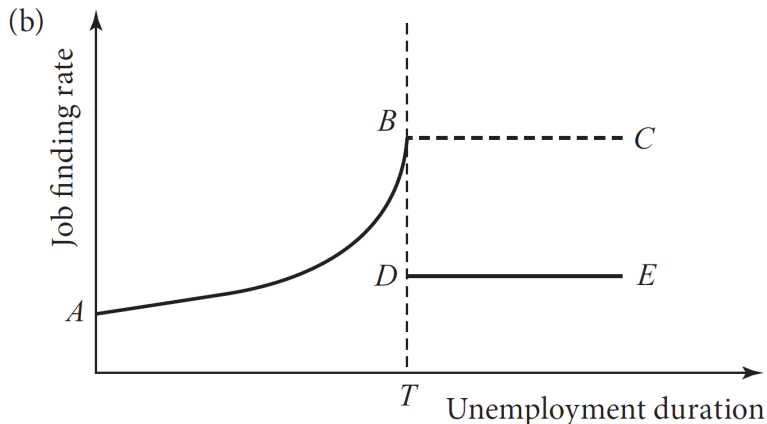
- Increase in job-finding rates shortly before benefits expire.
- Real or artificial phenomenon?
- Card et al. (2007): Unemployment exit rate increases much more than the re-employment hazard rate \rightarrow the spike in unemployment exit rates is due to measurement error
- A static model
- A dynamic model

BOX 4: End-of-benefit Spike – Static Model



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX4: End-of-benefit Spike – Dynamic Model



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 5: Van Ours & Vodopivec (2006, 2008)

- Reform in Slovenia reducing potential benefit duration
- Maximum benefit duration dependent on previous work experience (months): 3 to 3, 6 to 3, 9 to 6, 12 to 6, 18 to 9, 24 to 9, 24 to 12, 24 to 18, 24 to 24.
- October 1998 inflow 1 year before, 1 year after
- Examples 12 to 6 both outflow to job and to other destinations increases

BOX 5: Monthly exit rate vs months of unemployment



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 5: Duration of unemployment (months)

Men	Experience (years)	PBD		Median duration (months)			
		Before	After	Before	After	Δ	$\Delta\Delta$
1	1 – 2.5	3	3	3.8	3.5	-0.3	
2	2.5 – 5	6	3	4.2	3.7	-0.5	-0.2
3	5 – 10	9	6	5.8	4.2	-1.6	-1.3
4	10 – 15	12	6	7.0	4.9	-2.1	-1.8
5	15 – 20	18	9	9.2	5.6	-3.6	-3.3
Av. 2–5				6.0	4.5	-1.5	-1.2

BOX 5: Quality of post-unemployment jobs

Wage change after – before (%)							
Men	Experience (years)	PBD		Wage change (%)			
		Before	After	Before	After	Δ	$\Delta\Delta$
1	1 – 2.5	3	3	12.5	9.0	-3.5	
2	2.5 – 5	6	3	17.2	11.4	-5.8	-2.3
3	5 – 10	9	6	16.3	12.8	-3.5	0.0
4	10 – 15	12	6	16.1	12.7	-3.4	0.1
5	15 – 20	18	9	16.6	13.6	-3.0	0.5
Av. 2–5				16.5	12.6	-3.9	-0.4
Job loss within a year (%)							
Men	Experience (years)	PBD		Job loss within a year (%)			
		Before	After	Before	After	Δ	$\Delta\Delta$
1	1 – 2.5	3	3	51.2	48.8	-2.4	
2	2.5 – 5	6	3	47.2	46.1	-1.1	1.3
3	5 – 10	9	6	43.2	44.4	1.2	3.6
4	10 – 15	12	6	46.6	43.0	-3.6	-1.2
5	15 – 20	18	9	42.1	43.0	0.9	3.3
Av. 2–5				44.8	44.1	-0.7	1.7

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 5: Van Ours & Vodopivec (2006, 2008)

Reduction of Potential Benefit Duration:

- Reduces actual unemployment durations
- Doesn't affect the quality of post-unemployment jobs
- Having longer to search for jobs had zero marginal effect on productivity
- Suggests that UB generate strategic opportunistic behavior

BOX 6: Lalive et al. (2006)

- 1989 policy change in Austria
- Making UB more generous for some groups, but not for others
- Age and earnings-specific changes in RR & PBD
- RR: 4-5% -points \uparrow
- PBD 30 \rightarrow 39 weeks for age group 40-49
- PBD 30 \rightarrow 52 weeks for age group 50+

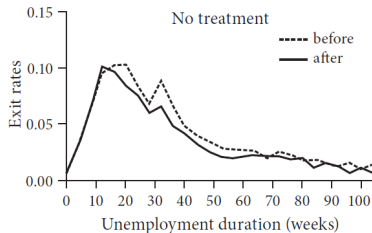
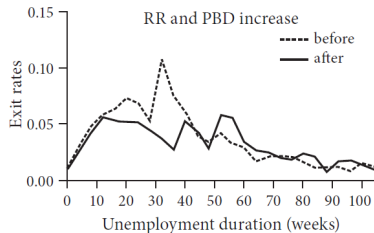
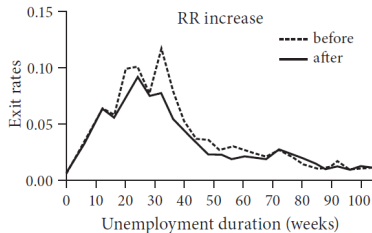
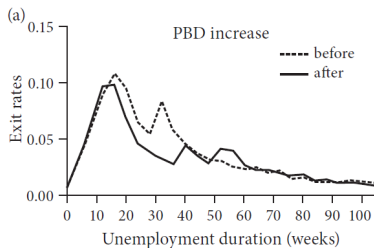
BOX 6: Lalive et al. (2006)

Lalive et al. (2006)				
Monthly income	Younger than 40 years Work experience		40 years and older Work experience	
	Low	High	Low	High
< 12,610 AS	RR↑	RR↑	RR↑	PBD+RR↑
≥ 12,610 AS	Control	Control	Control	PBD↑

Average U-duration				
Weeks of U	Before August 1989	After August 1989	Δ	ΔΔ
PBD	16.3	18.7	2.4	1.1
RR	17.8	20.0	2.2	0.9
PBD & RR	19.0	23.5	4.6	3.3
Control group	15.2	16.5	1.3	

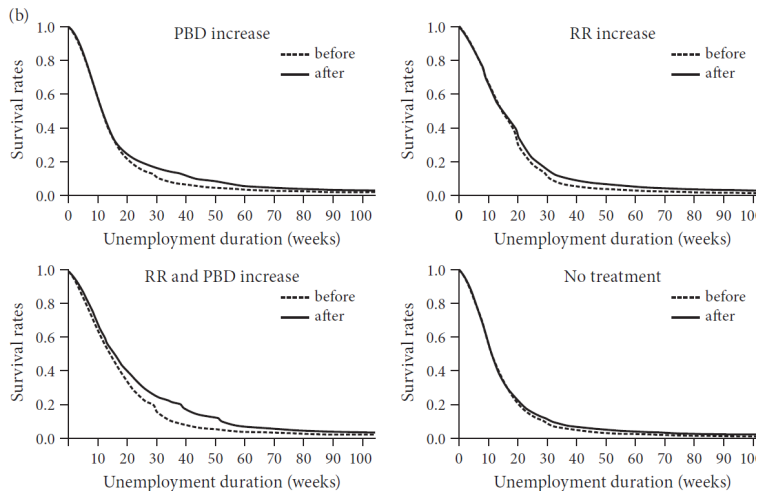
► BOX 6: RR increase

BOX 6: Exit rates - 4 groups



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 6: Survivor functions - 4 groups



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

BOX 6: Conclusions Lalive et al. (2006)

- Prime age workers: PBD extension: +0.35 days/week - older workers: +0.70 days/week
- Simulations costs:
 - With unchanged behavior
 - Behavioral responses
- RR: 10% behavioral effect
- PBD: 20-50% behavioral effect = more effective to influence job search behavior

“Good” side of UBs

- Incentives to accept also risky jobs (precarious or with temporary spells) for the outsiders
- May improve mobility in economies experiencing structural change if in the declining sector there is wage compression
- Entitlement effect may also decrease the reservation wage and reduce unemployment

Policy endogeneity

- Extended duration of unemployment. Benefits often granted as policy response to crises
- Regionally adjusted UBs in the US (Card and Levine, 2000)
- Austrian Regional Extended Benefits Program (Lalive-Zweimueller, 2002): benefits extended from 30 up to 209 weeks

Empirical findings

- Policy endogeneity is significant
- Estimates of the effects of UB duration on long-term unemployment is likely to be biased upwards
- Yet it is still there: in Austria increase in benefit duration from 30 to 209 weeks reduces the transition to jobs by 17% (40% without correcting for endogeneity), increasing expected unemployment duration by 9 weeks

Moral Hazard vs. Liquidity & Optimal Provision of UI

Chetty, 2008

- Robust evidence that $\uparrow b \rightarrow \uparrow$ unemployment duration: **moral hazard**, wage $w - b$ instead of w
- Alternative explanation: job losers cannot smooth consumption perfectly (failure in credit & insurance mkts): **liquidity constraint**
 - \uparrow UI, \uparrow consumption when unemployed, \downarrow job search incentives
- Evidence that increases in benefits have much stronger effects on duration for liquidity-constrained households
- From a normative standpoint it would be better to address directly the market failure, that is, (imperfect credit & insurance mkts)

Trade-offs in the provision of UB

- Reduced incentives to work
- Fiscal costs
- Better risk sharing (with risk-averse workers) Increase in welfare
- Spillovers: workers encouraged to take risky, high-productivity, jobs
- Subsidy to job search, matching efficiency.
Acemoglu-Shimer: there can be productivity gains by raising UB in the US to European levels

Possible private provision of unemployment insurance?

- No because moral hazard and adverse selection. Asymmetric information.
- Workers can alter the probability of losing a job
- Private insurance would ask for premiums selecting only workers with higher than average risk
- Risk pooling problem: risks are correlated (e.g., during recession)

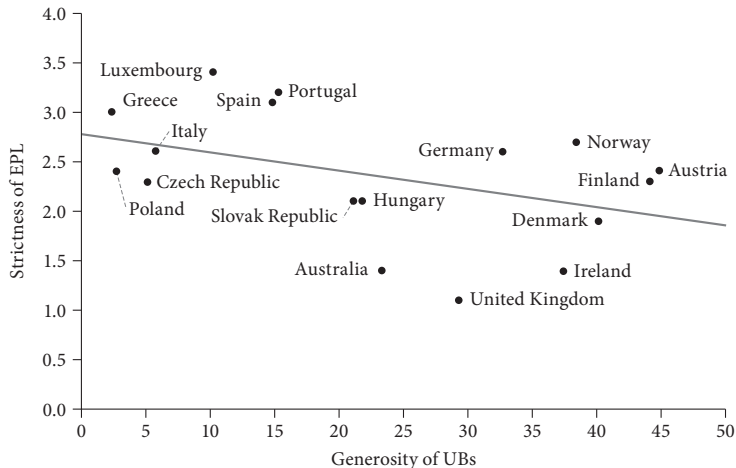
Optimal design of UBs

- Public provider faces the same moral-hazard problems (as compulsory contributions, less adverse selection), related to the non-verifiability of search effort.
- Ways to reduce disincentives to seek jobs
- Low replacement rates, declining with unemployment duration. Administrative pressure on recipients (help and hassle). Offer of slots in ALMPs as a way to elicit effort
- Financial incentives to the take-up of jobs: premiums in terms of residual benefit claims and in-work benefits

Interaction with Other Institutions

- UB similar function to EPL: to protect workers against uninsurable labor market risk: 3 key differences:
 - ① EPL protects only those who have a job
 - ② EPL do not impose a tax burden on workers, UB financed through payroll taxes
 - ③ Under EPL, it is the employer offering replacement income, while UB are risk-sharing devices imposing a fiscal externality on all workers and employers
- appropriate adjustment of UB and EPL. They are not perfect substitutes + Political-Economic reasons
- Flexicurity: Low EPL and generous UB (e.g. Denmark)
 - ALMP can reduce moral hazard associated with UBs
 - Interaction with payroll taxes

Generosity of UB and Strictness of EPL



Source: OECD (2010)

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

UB as an automatic stabilizer during recessions

Vroman, 2010

- In recessions, \uparrow unemployment \rightarrow \downarrow consumption \rightarrow \downarrow economic activity even further
- UI automatically increases during recessions, to maintain workers' purchasing power & break the negative cycle
- Usually, response comes from changes in legislation
- Is UI an effective stabilizer? Evidence from US, 2008-2009 recession:
 - The regular UI program closed about 10.5% of real GDP shortfall caused by recession
 - Further 8.5% closed by extended benefits
 - Overall, UI program closed 18.3% of the gap in real GDP caused by recession
- Stronger stabilization power during 2008-2009 recession as compared to other crises, as extended benefits' response has been particularly strong

Why do UBs exist?

- Properly designed UBs improve the allocation of human capital and thus, foster economic growth
- However, UBs should not be too generous in order not to discourage job search altogether and generate stagnant unemployment pools.
- The most relevant issues do not concern whether or not a country should have a UB system, but how the system should be designed along its several dimensions. Difficult to reform once in place.

Review questions

- 1 Why do replacement rates offer an incomplete measure of the generosity of unemployment benefits?
- 2 How does the introduction of a UB system affect labor force participation?
- 3 What type of relationship do we expect to observe between generosity of unemployment benefits and structural change?
- 4 How and why does an increase in the potential benefit duration affect the outflow from unemployment?
- 5 Explain the essential differences between the concept of “reservation wage” in labor supply theory and in job search theory.

Exercise

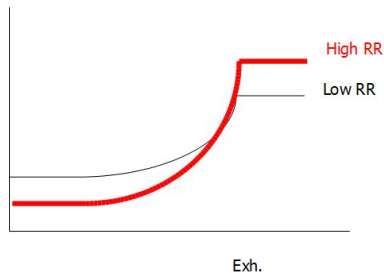
A worker is looking for a job. His marginal revenue from job search is $MR = 50 - 1.5w$, where w is the wage offer at hand, whereas his marginal cost of job search (in presence of unemployment benefits) is $MC = 5 + w$.

- 1 Provide an interpretation to MR and MC curves: why is MR a negative function of the wage at hand? What does the intercept of MC represent? And its slope?
- 2 What is the worker's reservation wage?
- 3 Suppose unemployment benefits are cut, such that the marginal cost of search increases to $MC = 20 + w$. What is the new reservation wage? Will the worker accept a job offer at 15 euros?

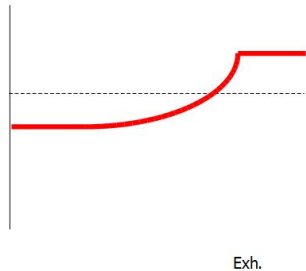
ADDITIONAL MATERIAL:

BOX 6: RR increase

Exit Rate

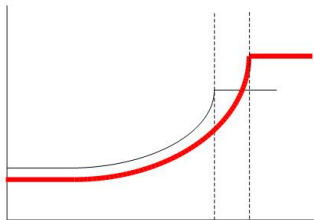


Difference



BOX 6: PBD increase

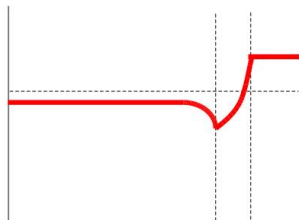
Exit Rate



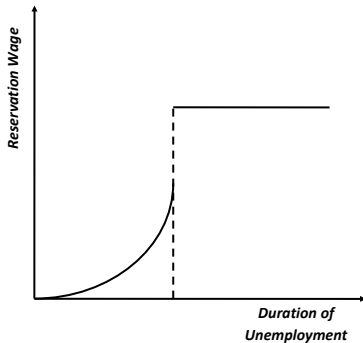
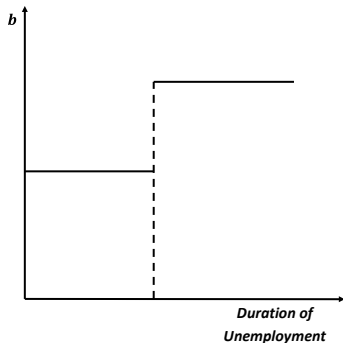
Difference

Long PBD

Short PBD



Interaction with Other Institutions



◀ UB as an automatic stabilizer during recessions

The Economics of Imperfect Labor Markets

Tito Boeri and Jan van Ours

December 2013

Tito Boeri and Jan van Ours (2013)

The Economics of Imperfect Labor Markets

Princeton University Press

Chapter 12. Active Labor Market Policies

What are we talking about?

4 basic functions of ALMP

- ① Raise output and welfare
- ② Maintain size of the effective labor force
- ③ Reallocate labor between sub-markets
- ④ Alleviate moral hazard problem of unemployment insurance

What are we talking about?

4 main types of ALMP

- ① Training
- ② Subsidized employment: direct job creation, wage subsidies
- ③ Public employment services (PES): placement, counseling and vocational guidance, job search courses
- ④ Activation: mandatory participation in 1-3 (workfare schemes) & benefit sanctions

Measures and Cross-Country Comparisons

Often but not always expensive

- Number of workers participating – mostly 2010
- Public expenditures (% of GDP) – mostly 2010
- Sanction rates - 1997/98

	Active labor market policies						Sanction rates
	Labor force involved (%)	Public expenditures (percentage of GDP)					
		Total	Training	PES	Job creation	Other	
Denmark	6.5	3.48	0.42	0.51	0.00	2.55	2.1
France	5.8	2.59	0.38	0.30	0.22	1.69	—
Germany	3.6	2.28	0.31	0.38	0.05	1.54	1.1
Italy	5.1	1.91	0.18	0.11	0.01	1.52	—
Netherlands	4.5	2.97	0.13	0.43	0.17	2.29	36.0
Spain	12.8	4.03	0.20	0.17	0.10	3.56	—
UK	0.2	0.71	0.02	0.34	0.00	0.35	5.5
US	—	0.90	0.04	0.04	0.01	0.81	35.4

BOX 1: The Beveridge Curve

- Employers with a vacancy recruit with the same intensity
- Homogeneous labor – all vacancies are alike
- Only unemployed search – no “on-the-job” search
- Well behaved matching technology
- Then: Equilibrium (“steady state”) relationship between unemployment and vacancies

BOX 1: Beveridge curve

William Beveridge (1879–1963) established empirical relationship between unemployment and vacancies

- $m = AU^{1-\alpha} V^\alpha$
- $F_{in}^u = \delta L$

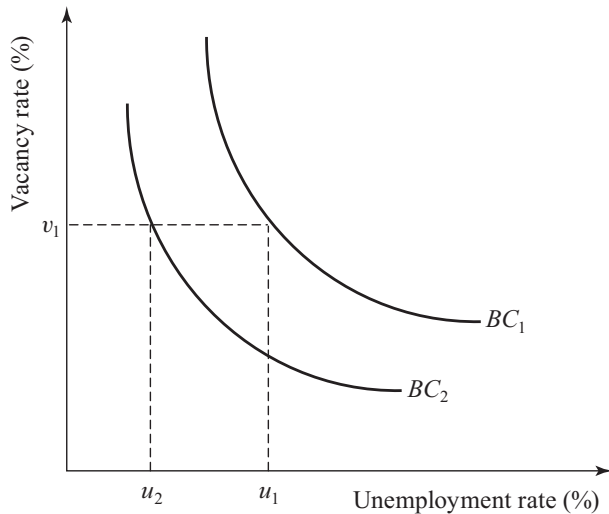
In steady state:

$$\delta L = AU^{1-\alpha} V^\alpha$$

or

$$\frac{\delta}{A} = \left(\frac{U}{L}\right)^{1-\alpha} \left(\frac{V}{L}\right)^\alpha \simeq u^{1-\alpha} v^\alpha$$

Theory



Empirical evidence

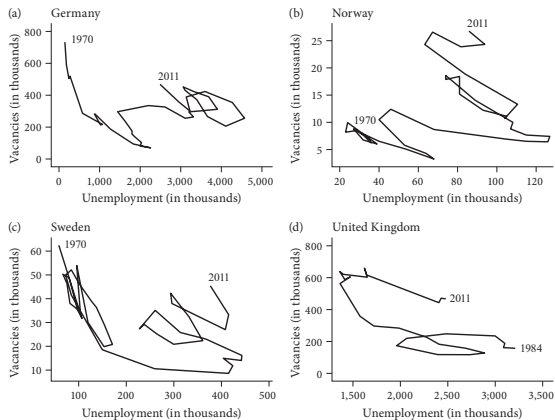


Figure: The Beveridge Curve in Four Countries

Shifts in Beveridge curve & effectiveness of ALMP

- Beveridge curve = equilibrium relationship
- Result of changes in vacancy formation, job search, labor demand and labor supply
- Direct effect & indirect effects of ALMP:
 - ① Displacement effects: jobs created replace other jobs
 - ② Deadweight effects: jobs would have been created anyway
 - ③ Substitution effects: job creation changes relative wages
 - ④ Tax effects

Empirical Evidence

Shifts in Beveridge curves - difficult to draw conclusions
Empirical studies

- Experimental: random allocation of workers to treatment group & control group
- Non-experimental: impose structure

Empirical Evidence – Experimental Studies

- Gorter and Kalb (1996): intensive counseling and monitoring (Netherlands)
- Dolton and O'Neill (1996, 2002): British Restart program
- Van den Berg and van der Klaauw (2006): counseling and monitoring (Netherlands)

BOX 2: ALMPs in the United States (I): Klepinger, Johnson, and Joesch (2002)

Experiment in the Maryland

- Assignment to control and treatment groups on the basis of social security numbers
- 4 treatment groups:
 - 1 4 employer contacts per week
 - 2 No specified number of contacts
 - 3 Four-day job search workshop (4 hours/day)
 - 4 Claimed employer contacts would be verified

BOX 2: ALMPs in the United States (II): Klepinger, Johnson, and Joesch (2002)

Outcome Measure	Control group	Treatment group effects			
		Additional contacts	No reporting of contacts	Workshop	Verify contacts
Total UI benefits paid (\$)	2,085	-116*	34	-75*	-113*
Weeks of benefits	11.9	-0.7*	0.4*	-0.6*	-0.9*
Exhausted benefits (%)	28.3	-2.5*	1.5*	-1.1	-2.8*
Percentage worked	80.0	1.1	0.8	-0.8	1.3
Earnings (\$)	8,407	54	347*	-163	124

Note: * means significantly different from the control group at the 5 percent level.

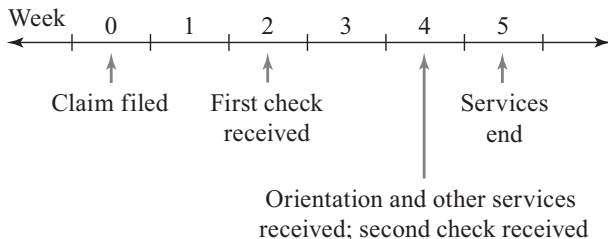
BOX 3: Profiling and Re-employment in the US

Black et al. (2003) – Kentucky Experiment

- Worker profiling 1-20 (sex, age, race, ethnicity, veteran status may NOT be used)
- Long predicted spells: receive employment & training services (Worker Profiling and Re-employment Services -WPRS) early in the spell
- Randomization at the margin - depending on available resources: for reasons of fairness

BOX 3: Results Kentucky experiment

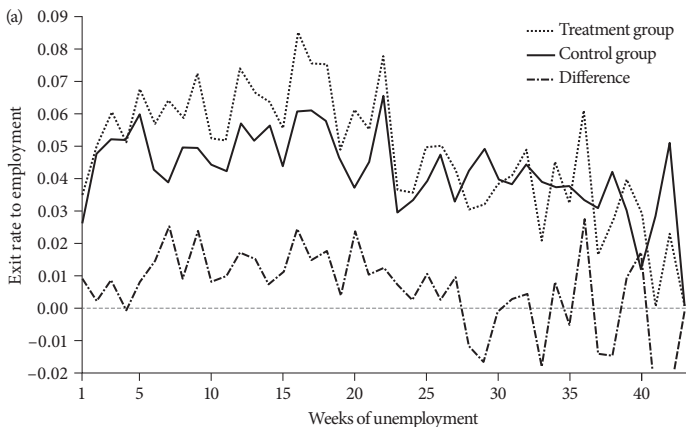
- Treatment group: 2.2 weeks reduction compared to control group
- Reduction in mean benefits payment of \$143
- Higher earnings in the year after the start of the UI claim (earlier back to work - not higher wages conditional on employment)
- Largely early exits - “threat” effect – large impact **after receiving letter**
- WPRS reduced moral hazard by acting as “leisure tax”



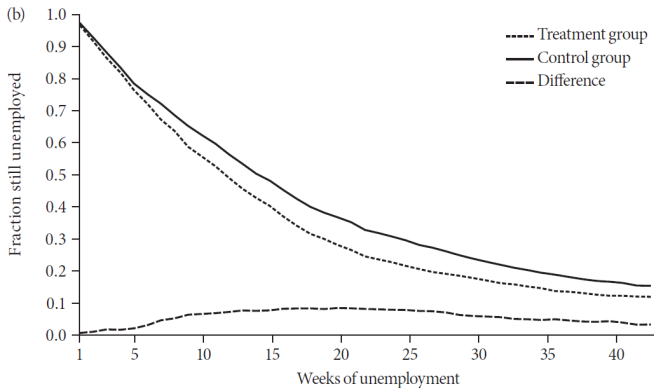
BOX 4: ALMPs in the Denmark: Graversen and Van Ours (2008)

- 2 regions in Denmark allocation of unemployed to treatment and control group on the basis of birth date
- Treatment group; after:
 - 1-2 weeks: letter with obligations
 - 5-6 weeks: job search program (2 weeks)
 - 4 months: activation program (3 months)
 - 6-7 months: make new job plan
- In between: frequent contacts with case workers

BOX 4: Weekly job finding rates



BOX 4: Fraction still unemployed



► Exit rates to job search programs

Results

- Job finding rate increases with 30%
- Median unemployment duration from 14 weeks to 11.5 weeks
- Why does the program work?
- Carrot = help provided to the workers
- Stick = threat effect – tax on leisure
- Follow-up study: distance matters

Empirical Evidence – Non-Experimental Studies

- Effects ALMP on job-finding rate rather small
- Disadvantage ALMP: locking-in effect
- Large effects of benefit sanction on job finding rate

Nonexperimental Studies

Summary of estimated impact of ALMPs

Impact estimate	Sample size	Percentage of estimates that are:		
		Significantly positive	Insignificant	Significantly negative
Short term	183	39.3	32.8	27.9
Medium term	108	50	39.8	10.2
Long term	50	54	40	6

Source: Card et al. (2010)

Note: Short term= 12 months; medium term=24 months; long term=36+ months

Problems: Labor Demand Effects

- Sorting into treatment and control groups
- Empirical research on employment conditional incentives has mainly evaluated the effects on labor supply.
- Labor demand effects could also be important.

Problems: Endogenous Sorting

- Activation relies on self-selection on the most needy.
- Thus serious endogenous sorting issue.
- Wage effects generally overlooked. Important also in partial equilibrium.

Policy issue 1: Do we need public employment services?

- Quasi-market: local employment services - “survival of the fittest”
- Profiling of unemployed workers: any better than random assignment?
- Assistance in finding jobs: locating relevant vacancies & update skills through training programs

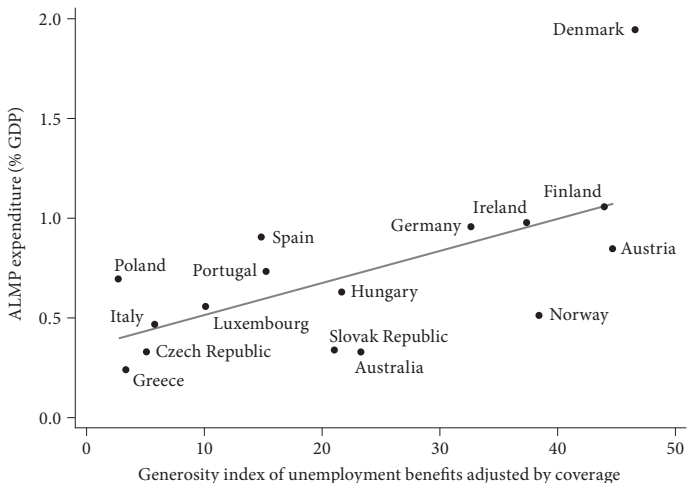
Policy issue 2: Do we need activation policies?

- Activation programs: participation is obligatory for benefit recipients
- Less attractive to be unemployed: increase outflow - reduce inflow
- Workfare programs: temporary jobs in exchange for unemployment benefits
- Sticks (sanctions) - carrots (wage subsidies)

► Profiling: what works, and for whom?

Interactions with Other Institutions

ALMPs reduce moral hazard associated with the provision of UBs



Review Questions

- 1 Through what mechanisms do benefit sanctions affect unemployment?
- 2 How do ALMPs affect the Beveridge curve?
- 3 In what way does the **lump-of-labor fallacy** affect the discussion concerning the effectiveness of ALMPs?
- 4 What is the relationship between the unemployment trap and upward pressure on wage levels?
- 5 Why would training be more effective in countries where unemployment benefits are high?

Why do active labor market policies exist?

Unemployment benefits - disincentives to find job:

- ① **Unemployment trap**: relatively high benefits discourage job search and put upward pressure on wages
- ② **Inactivity trap**: same trap without unemployment benefits; income-related benefits may be lost upon taking paid work
- ③ **Poverty trap - low-wage trap**: in low-paid work insufficient incentives to increase working hours or move to higher paid job - income-tested benefits

Review Questions

- Why might one criticize subsidized jobs as a policy instrument to bring the unemployed back to work?
- Why is training possibly more effective in reducing unemployment than are subsidized jobs or public employment services?
- Through what mechanisms do benefit sanctions affect unemployment?
- How do ALMPs affect the Beveridge curve?
- In what way does the lump-of-labor fallacy affect the discussion concerning the effectiveness of ALMPs?
- How do intensive interviews with employment counselors affect the behavior of unemployed workers?
- What does profiling mean, and what is known about its effectiveness in reducing unemployment duration?
- What is the relationship between the unemployment trap and upward pressure on wage levels?
- Why would training be more effective in countries where UBs are high?

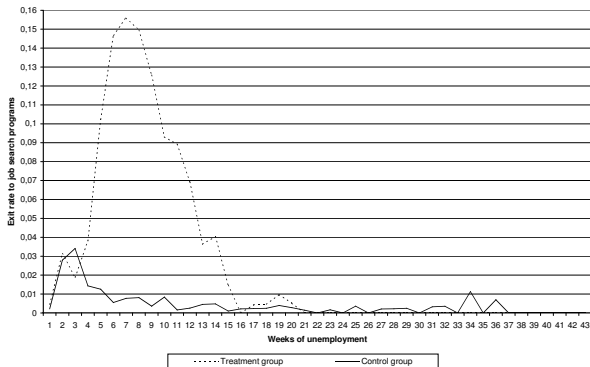
Exercise 11 p. 370

Consider a matching function specified as $M = \lambda U^\alpha V^{1-\alpha}$, in which M is the number of matches per time period, U is the stock of unemployed workers, V is the stock of vacancies and λ represents the efficiency of the matching process. The job separation rate equals δ and there is constant labor force normalized for convenience to one.

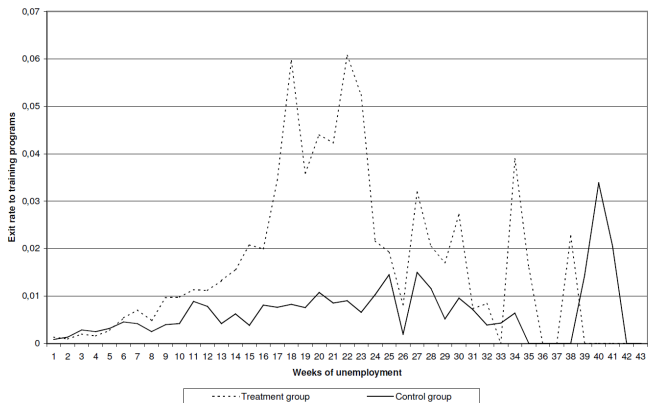
- 1 Show that the Beveridge curve shifts outward if δ increases.
- 2 Show that if the government invests in increasing the match efficiency the Beveridge curve shifts inward.

ADDITIONAL MATERIAL:

Exit rates to job search programs



Exit rates to training programs



◀ BOX 4: ALMPs in the Denmark: Graversen and Van Ours (2008)

Profiling: what works, and for whom?

J. P. Martin, OECD Economic Studies

Programmes	Appears to help	Appears not to help
Normal classroom training	Women re-entrants	Prime-age men and older workers with low initial education
On-the-job training	Women re-entrants; single mothers	Prime-age men (?)
Job-search assistance (job clubs, individual	Most unemployed but in particular, women and sole parents	
<i>f which</i>	Most adult unemployed	
Re-employment bonuses		
Special youth measures (training, employment subsidies, direct job creation measures)		Disadvantaged youths
Subsidies to employment	Long-term unemployed; women re-entrants	
<i>f which</i>	Men (below 40, relatively better educated)	
Aid to unemployed starting enterprises		
Direct job creation	Severely disadvantaged labor market groups.	Most adult unemployed

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Chapter 13. Payroll taxes

Payroll taxes: What are we talking about?

- Payroll taxes = income taxes & social security contributions
- Payroll taxes drive a wedge between labor costs and net wage
- Social security – deferred consumption (public pensions)
- Incidence of taxation – who pays?
 - Employers – workers
 - Balance of powers: slopes of supply and demand curves

Measures

- Average tax rate
- Marginal tax rate
- Marginal effective tax rate
- Progressive tax system
- Social security: employer - employees
- Tax systems are complex, impossible to summarize by one particular number
- Include VAT?

Payroll taxes and VAT rates, 2011 (%)

Single persons without dependents who earn 100% of the average wage.

Country	Income tax	Average tax wedge (%)		Total	tax wedge (%)	VAT (%)
		Employee SSC	Employer SSC			
Denmark	28	10.7	0	38.7	42.3	25
France	14.3	13.7	42.3	49.4	51.3	20
Germany	19	20.9	19.7	59.8	60.4	19
Italy	21.3	9.5	32.1	47.6	54.1	21
Netherlands	16	15.4	10.2	37.8	47	19
Spain	15.6	6.4	29.9	39.9	48.1	18
United Kingdom	15.6	9.5	11	32.5	40.2	20
United States	17.2	5.7	9.5	29.5	41.8	–

Source: OECD tax database (2012)

$$\text{Total tax wedge} = 100 \cdot \frac{\text{Income tax} + \text{Employee SSC} + \text{Employer SSC}}{100 + \text{Employer SSC}}$$

Cross-country comparison

- Average payroll tax rate: 29.5 (US), 49.4 (France)
- Marginal tax rate: 34.4 (US), 52.0 (France)
- All countries: marginal tax rates higher than average tax rates – progressive tax systems

Total net income and marginal effective tax rates of first and second earners (%)

Country	Net income (%)			Marginal effective tax rates (%)		
	T1	T2	T3	H1	H2	H3
Denmark	62	73	66	94	89	61
France	51	58	55	89	36	43
Germany	50	66	58	76	54	54
Italy	52	61	57	-8	38	52
Netherlands	62	69	69	88	42	41
Spain	60	66	63	62	16	19
United Kingdom	67	74	72	72	67	77
United States	70	82	75	46	52	52

T1 = single person

T2 = lone parent with two children

T3 = one-earner couple with two children

H1 = moving from inactivity to 67

H2 = first earner at 67

H3 = one earner from 67 to 100

Included in income are earnings, social assistance, family benefits et cetera

Source: OECD (2005), OECD(2012) Source: Tito Boeri and Jan van Ours (2013), The Economics of Imperfect Labor Markets, Princeton University Press.

Cross-country comparisons – family situation

Effects of tax-benefit system on net income of various types of workers:

- Household net incomes of working lone parents higher than net incomes of working singles
- Sometimes for one-earner couple with two children net income higher than gross income

Cross-Country Comparisons – Changes in labor market position

- H1 = Single earner from inactivity to 67% of APW: Italy -8%, Denmark 94%
- H2 = One spouse 67% APW other moves from inactivity to 33% APW; marginal effective tax rate: 16% (Spain) to 89% (Denmark)
- H3 = One earner moving from 67% to 100% of APW: Spain 19%, UK 77%
- Polarization work-rich and work-poor families ($H2 < H1$):
 - Neither is working - big disincentives
 - One is working - substantially smaller incentives

Theory – A Perfect Labor Market

Labor supply - extensive & intensive margin

Labor demand - increase in costs

- Wedge
- Competitive markets: tax paid by worker/employer – slopes demand and supply curves
- Non-competitive markets:
 - Bargaining: labor supply curve \rightarrow wage-setting equation: slope increases
 - Workers use their market power to take most of a decrease in taxes

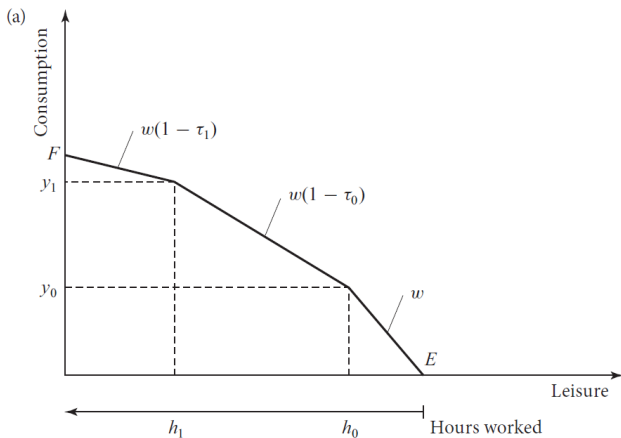
A Perfect Labor Market – Different tax schemes

The interaction of taxes, social security contributions, transfers and withdrawals implies that the budget constraint of an individual is non-linear → composed of different segments:

$$C = \begin{cases} wh & \text{if } h \leq h^0 \\ wh^0 + w(1 - \tau_0)(h - h^0) & \text{if } h^0 < h \leq h^1 \\ wh^0 + w(1 - \tau_0)(h - h^1) + w(1 - \tau_1)(h - h^1) & \text{if } h > h^1. \end{cases}$$

where $h^0 = \frac{y^0}{w}$, $h^1 = \frac{y^1 - y^0}{w(1 - \tau_0)} - h_0$

Different tax schemes



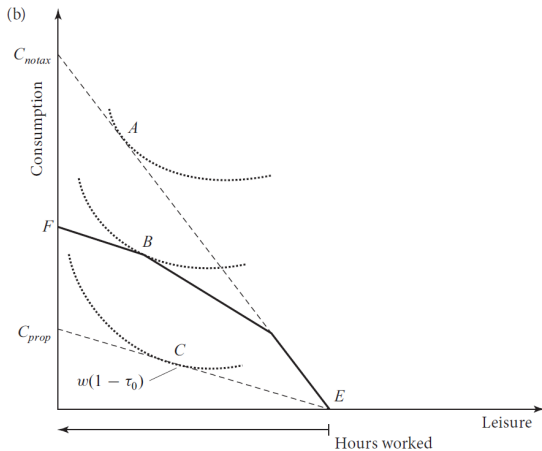
Notes: C_{max} progressive tax system

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Leisure-labour choices at different tax wedges

- Both the presence and the structure of taxes matter in affecting labor supply decisions
- A progressive tax system is bound to affect more the intensive than the extensive margin
- Minimum Guaranteed Income (MGI) schemes → flat segment of budget constraint: the not-to-work decision

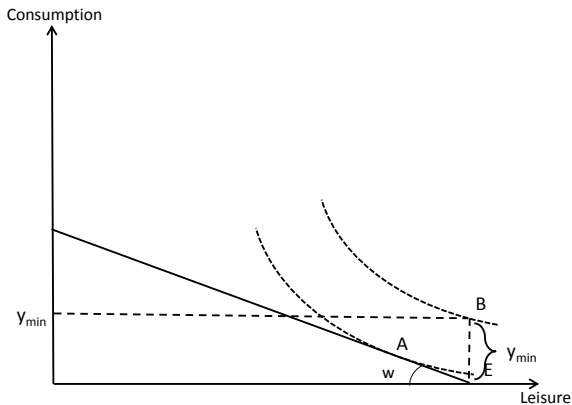
Leisure-labour choices at different tax wedges



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Minimum Guaranteed Income (MGI)

A take-it-or-leave-it cash grant to non-working individuals may encourage the worker to leave the labor force.



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Box 1: Labor Supply and the Evaluation of Payroll Taxes

$$L^d = L^d(w(1 + t_f))$$

$$L^s = L^s(w(1 - \rho_w t_e) + \rho_e w t_f)$$

Where w is the pre-tax wage, t_f is the part of the tax paid by the employer, t_e is the part of the tax paid by the worker, ρ_w is the discounting of employee taxes by employee and ρ_e the valuation of employer taxes by employees relative to cash income.

Imposing equilibrium condition

$$\frac{\delta w / w}{\delta t_f} = - \frac{\epsilon - \eta \rho_e}{\epsilon - \eta(1 - \rho_w t_e)}$$

Where ϵ is the inverse elasticity of labor supply, and η is the inverse of the labor demand elasticity

Source: Tito Boeri and Jan van Ours (2013), The Economics of Imperfect Labor Markets, Princeton University Press.

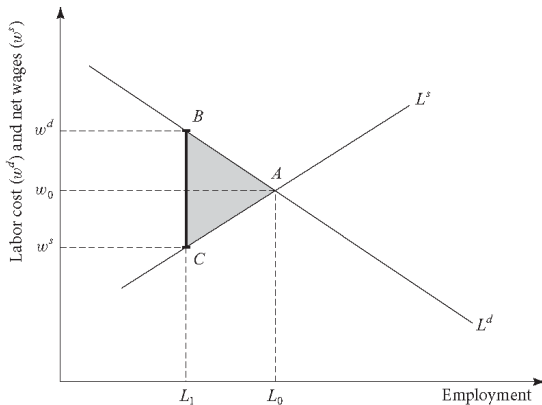
Box 1: Labor Supply and the Evaluation of Payroll Taxes

$$\frac{\delta w/w}{\delta t_f} = -\frac{\epsilon - \eta\rho_e}{\epsilon - \eta(1 - \rho_w t_e)}$$

There are three situations in which a tax is fully shifted to workers ($\frac{\delta w/w}{\delta t_f} = -1$) and therefore there's no effect on employment:

- $\epsilon = \infty$; inelastic (vertical) labor supply.
- $\eta = 0$; perfectly elastic (horizontal) labor demand.
- $\rho_w = 0$ and $\rho_e = 1$; all taxes are considered benefits.

Competitive market – who pays?

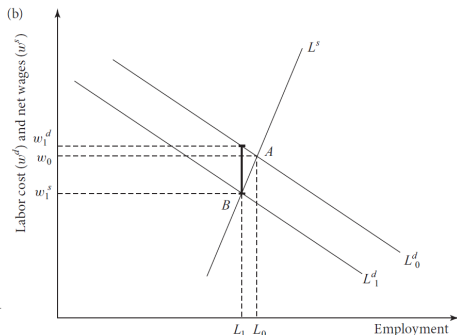
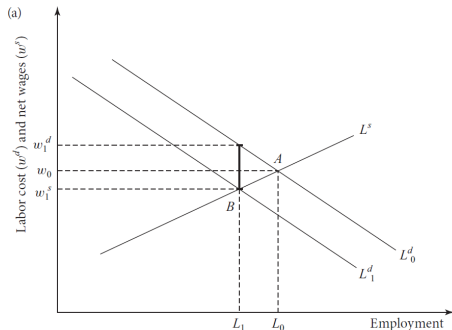


► Effects of tax reduction

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Imperfect Labor Markets

Employment and wage effects of a tax depend on the slope of the wage-setting function



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Structure of Taxation and Indexation of Benefits

- If *matching frictions*, no effects of taxes on employment/unemployment if UB fully indexed to wages
- More progressive tax systems reduce unemployment, by increasing employment along the extensive margins and reducing it along the intensive
- Similar is the case with *unions*
- With efficiency wages structure of taxation does not matter

► Why is indexation of non-labour income important?

Empirical evidence

- Labor supply of men not much affected by changes in tax rates
- Labor supply of women increases if net wage increases
- 4 groups of workers where high taxes may affect behavior:
 - 1 In work with high incomes
 - 2 In work with low incomes & eligible for benefits
 - 3 Nearing retirement
 - 4 Considering entrance into the labor force

The incidence of payroll taxation

Gruber (1997)

- Chile, 1981: Exogenous (legislative) change in social insurance financing: shift from employer payroll taxes to general revenues
 - Drop of payroll tax rate from 29 percent (1979/80) to 5.5 percent (1984/85)
- Tax effects are summarized in the following table:

% Effect	Wages	Employment
Blue collar	-0.9	0.2
White collar	-1.4	-0.2

- Wage effect close to -1, employment effect close to 0
- Reduced payroll taxes fully passed on to wages

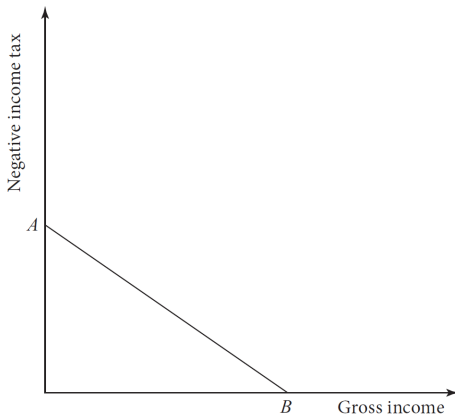
Policy issue 1: How to Make Work Pay?

With pure MGI welfare is reduced one-to-one (100% METR). Strong disincentives to work.

Alternatives:

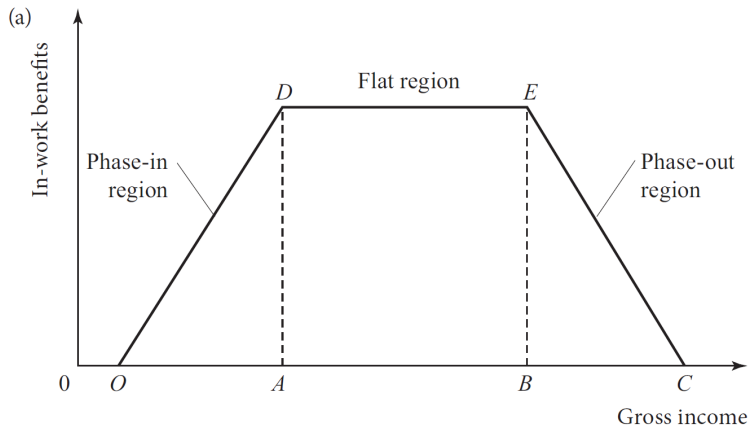
- 1 Earning disregards: some earnings are not counted in withdrawing welfare benefits
- 2 Employment-conditioned incentive (ECI): individuals only receive benefits if they work - phase-in & phase-out range

The design the negative income tax



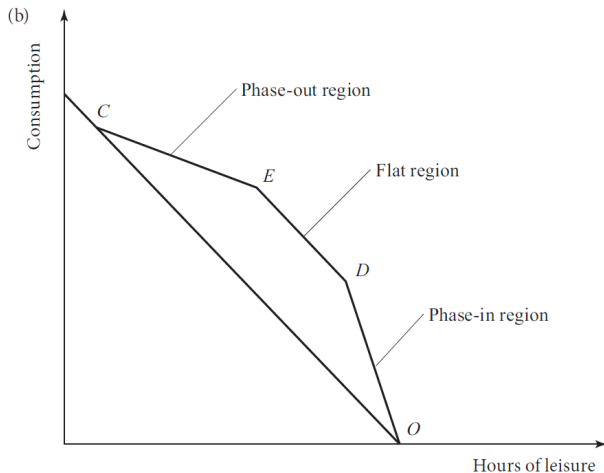
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

The design the in-work benefits



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

In-work benefit and the Budget Line



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

MGI or ECI?

Optimal system depends on the behavioral response of individuals:

- ECI:
 - Mostly along extensive margin: participation
 - Reduced incentives to work longer hours or earn higher wages
- MCI:
 - Provides largest transfers to low-income earners: most in need of support
 - Has adverse effects on labor supply along the extensive margin

The Devil is in the Details

- Design features are essential
- Targeting Individuals or Households?
- How to treat Assets (e.g., house ownership)?
- How to Deal with Differences in the Cost of Living?

Example of ECI research: Eissa and Liebman (QJE 1996)

- ECI introduced 1986
- Single mothers were eligible
- Participation rates of unmarried women:

	Before EITC	With EITC	Difference	Dif-in-dif
Children	72.9	75.3	2.4	
No Children	95.2	95.2	0.0	2.4

Box 2: In-work benefits in action – Card and Hyslop (2005)

- Canadian Self Sufficiency Project
- New system of time-limited earnings subsidies for long-term welfare recipients
- Applied to individuals who accepted full-time jobs (more than 30 hours per week), could last up to 3 years
- Once workers were offered the scheme they had to begin to work within a year
- Random assignment: 50% offered the SSP benefits, 50% got regular benefits

Box 2: In-Work Benefits in Action

- paid half of difference between actual earnings and **target amount**
- Example 1992:
 - 35 hours/week - \$ 7/hour: \$ 12,730 per year (earnings)
 - Target amount: \$ 37,000
 - Subsidy = $(37,000 - 12,740) \times 0.5 = \$ 12,130$
 - Total income: \$ 24,860
 - Non SSP recipient totally on welfare: \$ 17,111
 - Non SSP recipient 35 hours/week - \$ 7/hour + traditional benefit: \$ 19,511
- **Most participants: \$ 3000-7000 more per year with SSP**

Box 2: Long run effects welfare dependence

Months since program start	Control group	Program group	Effect of program
6	90.8	83.1	7.7
12	83.7	72.4	11.3
24	73	63.3	9.7
36	65.4	58.8	6.6
48	56.7	53.5	3.2
60	50.6	48.4	2.2
69	45	45	0

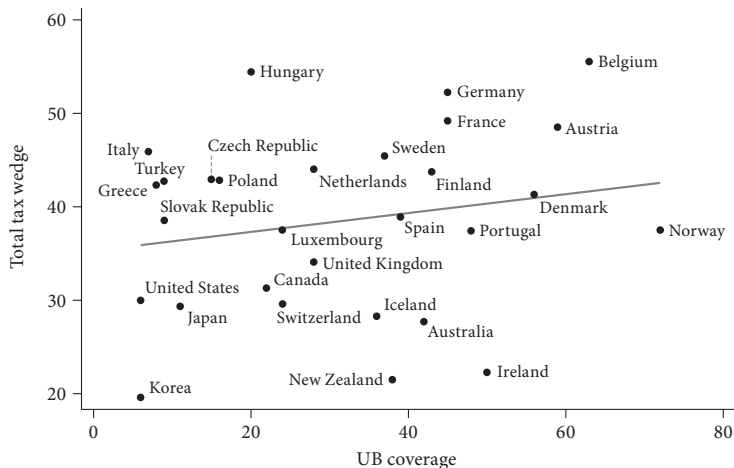
Program ended after 69 months = 5.75 years

So: **no long-run effects**

Overlaps with other institutions

- Family policies: individual – family
- Unemployment benefits: incentives
- Unions: bargaining power
- Early retirement programs
- Active labor market policies: incentives

Taxes and Unemployment Benefits



Source: OECD (2007)

Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Why do payroll taxes exist?

- Funding government expenditures
- Social security contribution parts directly related to the functioning of labor markets
- Contribution to public pension programs: tax or savings?

Review questions

- 1 How do in-work benefits affect incentives of unemployed workers?
- 2 What happens during the phase-in and phase-out regions of in-work benefits?
- 3 Why does the impact of taxes depend on the nature of the labor market?
- 4 What are the main purposes of negative income taxes and in-work benefits, and what are the essential differences between the two systems?
- 5 What is the trade-off between wage subsidies and tax credits?

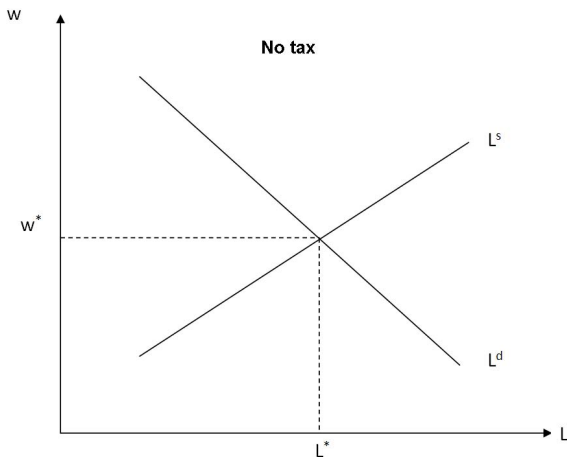
Exercise

Suppose the supply curve of fast-food employees is given by $w = 10 + 5L$, while the demand curve is given by $w = 50 - 3L$.

- Compute the equilibrium levels of wage w , employment L , and unemployment U .
- How do these levels change with the introduction of a payroll tax of 25 percent, to be paid by employers?
- How do these levels change if the same payroll tax is instead paid by employees, on wages?

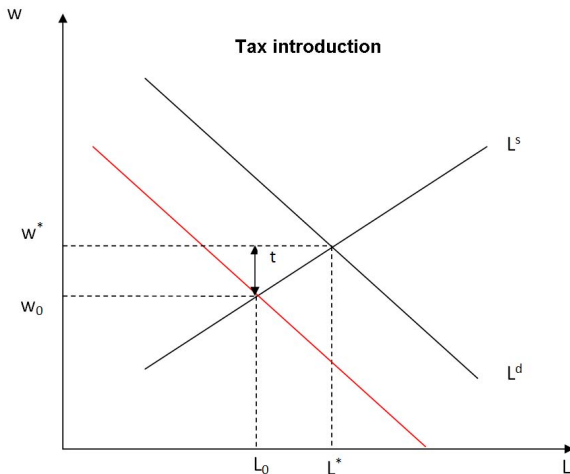
ADDITIONAL MATERIAL:

Effects of tax reduction – Competitive Market



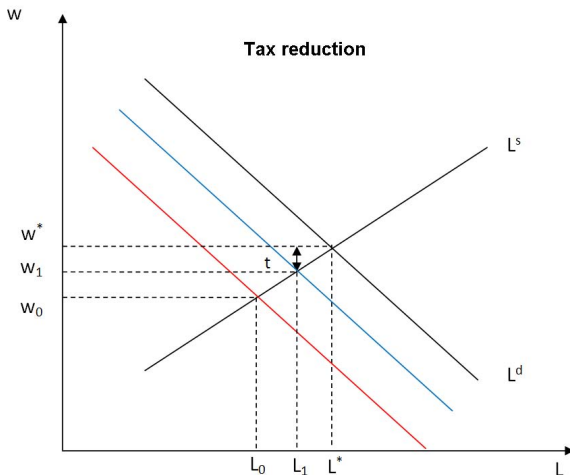
Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Effects of tax reduction – Competitive Market



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Effects of tax reduction – Competitive Market



Source: Tito Boeri and Jan van Ours (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.

Effects of tax reduction – Competitive Market

- Response depends on elasticity of demand and supply
- The elasticity of supply is affected by the way in which non-labor income is taxed:
 - If non-labour income is not taxed, then more effect on employment, less on wages
 - If non-labour income is taxed just like labour, more effect on wages, less on employment

Effects of tax reduction – Non-Competitive Market

In equilibrium, there is unemployment also without taxes.

Effects of taxes depend on type of imperfections. 3 types of deviations from competitive equilibrium:

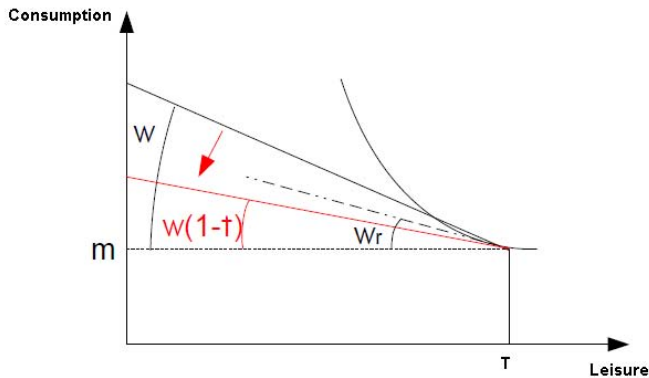
- **Unions - collective bargaining:** labor supply above reservation wage function
- **Search frictions:** returns of employers and workers over reservation wages
- **Efficiency wages:** workers paid more to increase their productivity

Stronger effects of taxes on employment/unemployment when taxation is proportional and non-labour income (non-employment benefits) are not taxed. Only in the case of efficiency wages the structure of taxation does not matter (hint: result is driven by labour demand)

◀ Competitive market – who pays?

Why is indexation of non-labour income important? (I)

m constant



Why is indexation of non-labour income important? (II)

m taxed like w

