

Will the old edge out the young?

Empirical evidence on cross-age crowding out from EU
aggregate data

Zsombor Cseres-Gergely*

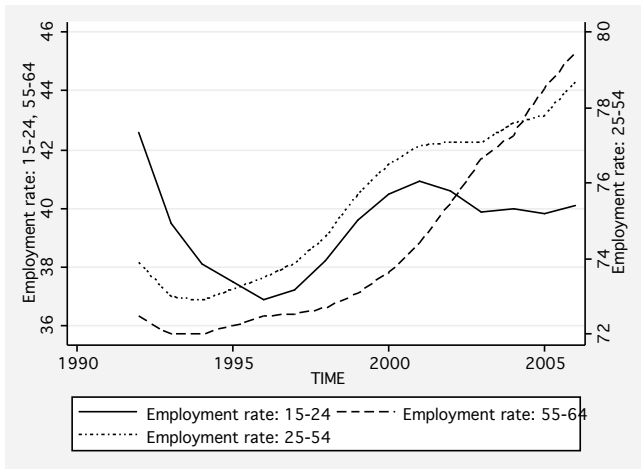
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Work Pensions and Labour Economics Study Group
Conference, 2008

Employment trends in the EU15 change around 2000

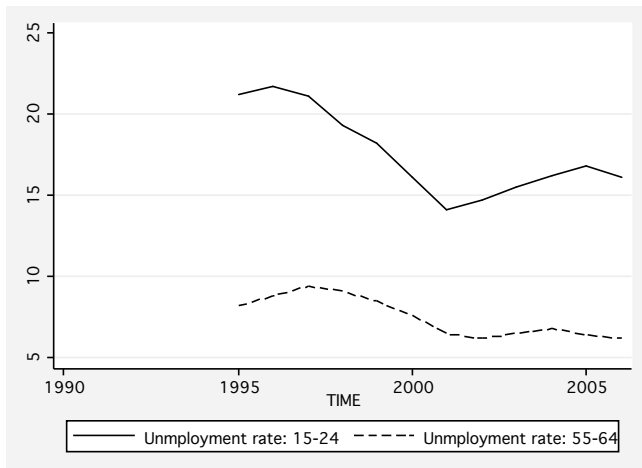
Employment rate of the young and others diverge



Source: EUROSTAT on-line database @ <http://epp.eurostat.ec.europa.eu>

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 - Motivation
 - Previous Work
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 - Data and its aggregation
 - An estimating equation
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Previous work on cross-age crowding

mixed evidence

- Herbertsson (2001): simple panel regressions - positive effect
- Skans (2005): regional data - negative effect found
- Jousten et al. (2008): Belgian time series data on changes in early-retirement regulation - no effect
- Layard-Nickell-Jackman (1991): early retirement schemes are of no use - no effect (mostly theoretical, long run)
- related: Boeri (2005) shows that increased employment of women can have negative effect on the young, especially on men

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Possible mechanisms that induce cross-age crowding

Substitution between inputs in general and in special ways can induce cross-age crowding.

- General substitution works through the production function - old and young labour can be substitutes (see Hamermesh, 1987).
- Substitution with fixed prices is called “q-substitution”. Grant-Hamermesh (1981) finds evidence for this between young men and older women.
- There might be barriers blocking symmetric adjustment. Pagés-Montenegro (2007) show that job protection can lead to the old being more protected than the young.
- There might be a “pipeline”, a “vacancy-chain” at work. Stewman (1988) is an example sociologist.

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Foundation: a production function

for the sake of analogy only ...

Starting with a Cobb-Douglas production function (such as $Y = J^\alpha O^\beta P^\gamma$), a basic result tells that if resources are optimally allocated,

$$J = \frac{w_o}{w_j} \frac{\beta}{\alpha} O$$

holds. Dividing and subtracting by N_J and N_O , and taking logs, one obtains that

$$\ln(J/N_J) = \ln\left(\frac{\beta}{\alpha}\right) + \ln(O/N_O) + \ln(N_O/N_J) + \ln\left(\frac{w_o}{w_j}\right)$$

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The operational equation

for practical purposes

Introducing parameters for adjustments to the factor demand function, we can motivate an estimating equation of the form:

$$\underline{\text{empr}^J_{i,t}} = \alpha + \beta \text{empr}^O_{i,t} + \gamma \text{relpop}^{OJ}_{i,t} + \delta Y + \underline{FE_i} + u_{it}$$

and using the equation derived by Jimeno and Palenzuela (2003), a similar one for unemployment:

$$\text{unempr}^J_{i,t} = \alpha' + \beta' \text{unempr}^O_{i,t} + \gamma' \text{relpop}^{OJ}_{i,t} + \delta' Y + FE'_i + u'_{it}$$

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Data and aggregation from the EU LFS

microdata allows for flexible aggregation

The EU LFS is a collection of the individual LFS data of member states that gives cross-country variability and is

- harmonised in terms of its information content (omitting some information present for some countries, such as wages)
- gives data for all EU members, but from different time on (almost all available from 2000)

The hypothesised relationship can operate on several markets. These can be looked at by using different aggregations. I aggregate by country and region, and within that, by sex, education and industry.

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Econometric issues

The equation is estimated using a linear fixed effects (FE) regression.

- Heteroskedasticity (aggregation) - correct standard errors
- Autocorrelation (serial correlation of errors) - correct standard errors (clustering)
- Endogeneity - use IV-FE. Instrument: cross-country jackknife mean.

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Before 2000 after 2000

The basic regression with 15-24 *employment* and *unemployment* on the LHS

	1996-2005			2000-2005		
	FE	FEb	FE-IV	FE	FEb	FE-IV
Employment						
Inempr5564	0.270 (0.26)	-0.127 (0.26)	0.277* (0.14)	-0.288 (0.17)	-0.445*** (0.15)	-0.356*** (0.13)
Inempr2554		2.114*** (0.39)			2.044*** (0.56)	
Constant	-0.678** (0.23)	-0.529* (0.26)	-0.672*** (0.12)	-1.190*** (0.15)	-0.848*** (0.19)	-1.249*** (0.12)
R^2	0.14	0.36	.	0.13	0.32	.
Unemployment						
Inunempr5564	0.406*** (0.088)	0.298*** (0.056)	0.913*** (0.16)	0.248*** (0.072)	0.235*** (0.072)	1.249** (0.63)
Inempr2554		-3.382*** (0.84)			-2.942* (1.59)	
Constant	-0.705** (0.28)	-1.835*** (0.30)	0.970* (0.55)	-1.173*** (0.23)	-1.904*** (0.49)	2.013 (2.02)
R^2	0.35	0.46	.	0.19	0.22	.
Observations	132	132	132	83	83	83
Countries	15	15	15	15	15	15

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$



Entry *employment* and *unemployment*

post-1999 data only

If the “vacancy chain” mechanism is at work, the effect of increased employment of the older will be strongest for the youth entering the labour market.

	Employment				Unemployment			
	(1) FE	(2) FEb	(3) FE-IV	(4) FE-IVb	(5) FE	(6) FEb	(7) FE-IV	(8) FE-IVb
Inempr5564	-0.0616 (0.24)	-0.214 (0.21)	-1.530* (0.88)	-1.769** (0.90)				
Inunempr5564					0.329*** (0.063)	0.311*** (0.064)	0.940 (0.69)	0.950 (0.70)
Inempr2554		2.573** (0.89)		3.712*** (1.41)		-5.238 (4.99)		-3.310 (6.07)
Constant	-0.504** (0.20)	-0.0293 (0.27)	-1.787** (0.77)	-1.118 (0.69)	-0.620*** (0.16)	-1.915 (1.29)	1.374 (2.26)	0.624 (3.08)
Observations	47	47	47	47	47	47	47	47
Countries	9	9	9	9	9	9	9	9
R ²	0.02	0.22	.	.	0.27	0.29	.	.

Robust standard errors in parentheses

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Entry *employment and unemployment*

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Market broken down by gender /1

post-1999 data only, *employment rate* on the LHS

FE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Men	Menb	Women	Womenb	Men	Menb	Women	Womenb
5564m	-0.346*	-0.418**			0.0652	0.329	0.258	0.457
	(0.19)	(0.18)			(0.27)	(0.22)	(0.40)	(0.40)
5564f			-0.153	-0.271*	-0.251*	-0.426***	-0.268	-0.401
			(0.15)	(0.13)	(0.14)	(0.13)	(0.24)	(0.25)
2554		1.782***		2.060**		3.077***		2.327**
		(0.51)		(0.82)		(0.56)		(0.87)
Constant	-1.095***	-0.733***	-1.201***	-0.851***	-1.105***	-0.456***	-1.139***	-0.649***
	(0.12)	(0.20)	(0.18)	(0.23)	(0.10)	(0.14)	(0.099)	(0.22)
R-squared	0.10	0.25	0.09	0.25	0.20	0.54	0.12	0.29
IV								
5564m	-0.742**	-0.940***			0.280	0.580	0.809	1.058
	(0.33)	(0.32)			(1.00)	(0.81)	(1.13)	(1.08)
5564f			-0.161**	-0.270***	-0.426	-0.559**	-0.510	-0.620*
			(0.079)	(0.087)	(0.30)	(0.25)	(0.34)	(0.33)
2554		2.001***		2.054***		3.361***		2.796***
		(0.55)		(0.61)		(0.69)		(0.92)
Constant	-1.344***	-1.010***	-1.210***	-0.851***	-1.147***	-0.375	-1.048***	-0.406
	(0.21)	(0.21)	(0.095)	(0.12)	(0.33)	(0.37)	(0.37)	(0.50)
Obs.	83	83	83	83	83	83	83	83
Countries	15	15	15	15	15	15	15	15

Robust standard errors in parentheses

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Market broken down by gender /2

post-1999 data only, *unemployment rate on the LHS*

FE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Men	Menb	Women	Womenb	Men	Menb	Women	Womenb
5564m	0.235*** (0.077)	0.209*** (0.062)						
5564f			0.0458 (0.14)	0.0241 (0.13)	0.0373 (0.095)	-0.0119 (0.081)	0.000351 (0.10)	-0.0301 (0.100)
2554		-4.656** (1.85)		-3.030** (1.22)		-6.176*** (1.78)		-3.833** (1.57)
Constant	-1.200*** (0.25)	-2.348*** (0.45)	-1.809*** (0.45)	-2.600*** (0.55)	-1.073 (0.64)	-2.676*** (0.64)	-1.429** (0.66)	-2.423*** (0.78)
R-squared	0.21	0.28	0.01	0.05	0.18	0.29	0.04	0.08
IV								
5564m	1.001** (0.50)	1.042** (0.48)			0.226 (0.65)	0.226 (0.65)	0.711 (0.78)	0.611 (0.81)
5564f			0.952 (0.67)	0.959 (0.61)	1.131 (0.87)	1.131 (0.98)	1.173 (1.04)	1.298 (1.21)
2554		-1.853 (3.54)		-0.209 (3.57)		-0.0145 (5.97)		4.786 (7.42)
Constant	1.173 (1.55)	0.877 (1.99)	1.131 (2.19)	1.105 (2.53)	2.346 (2.62)	2.343 (3.76)	3.908 (3.14)	5.024 (4.67)
R-squared
Obs.	83	83	80	80	80	80	80	80
Countries	15	15	15	15	15	15	15	15

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Extensions

The models can also be run on subsamples defining a different/smaller labour market.

- Using NUTSII regions give similar, but weaker effects. Makes sense: migration away from competition diminishes the effect.
- Using sectors shows differences in effects, but results are not robust. Taking on face value: service sector.

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Summary

- There can be **mechanisms** explaining cross-age crowding.
- The established relationship is most relevant for **young men and older women**.
- The relationship is **robust only for employment-**, but not for unemployment rates (education?!).
- To do: Move closer to causality.
 - Strengthen link to theoretical foundations.
 - Introduce further instruments for robustness / overidentification.

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