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Human Capital, Regional Economic Development and Inequality

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John Maynard Keynes prediction in 1930:

In the summer of 1930, at the start of the Great Depression, John Maynard Keynes gave a speech in Madrid entitled «Economic Possibilities for our Grandchildren». He stated that, over time, humankind was solving its economic problems thanks to the process of capital accumulation.

He predicted that the standard of living in progressive countries would, in one hundred years, be between four and eight times higher than it was in 1930, and that the standard working week would be fifteen hours. An important societal problem foreseen in Keynes' prediction would be how to spend leisure time (Keynes, 1963).

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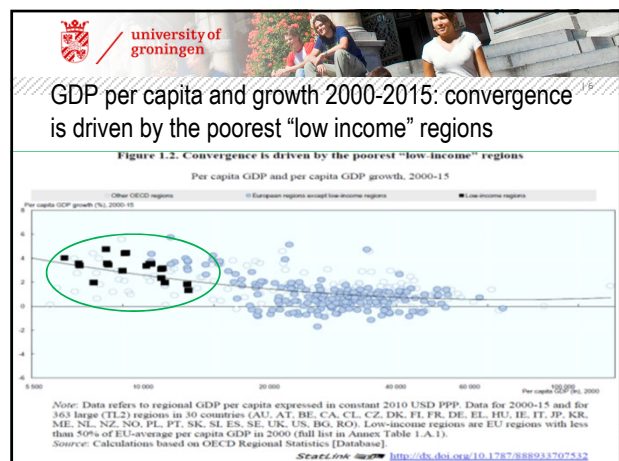
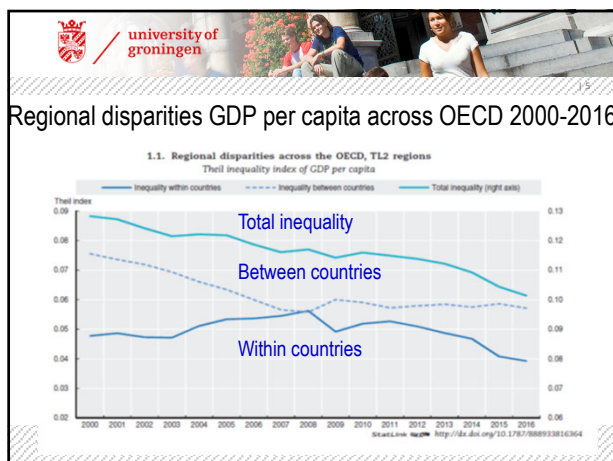
Current trends on (regional) labour markets (1)

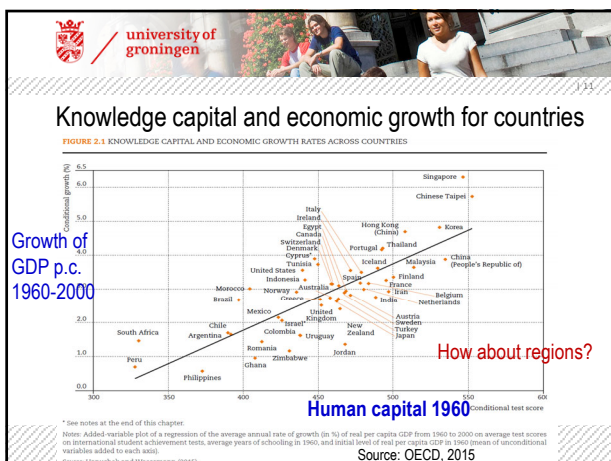
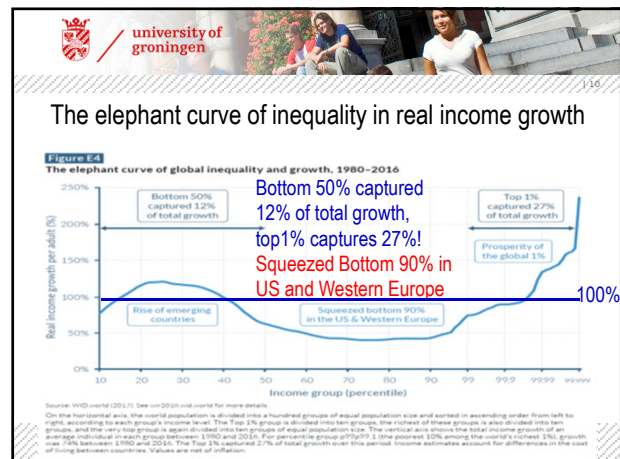
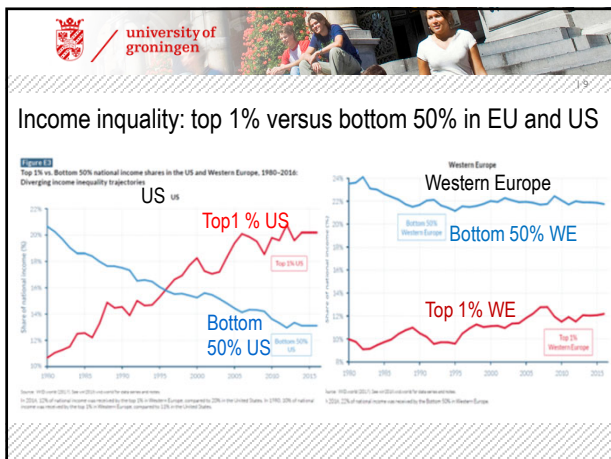
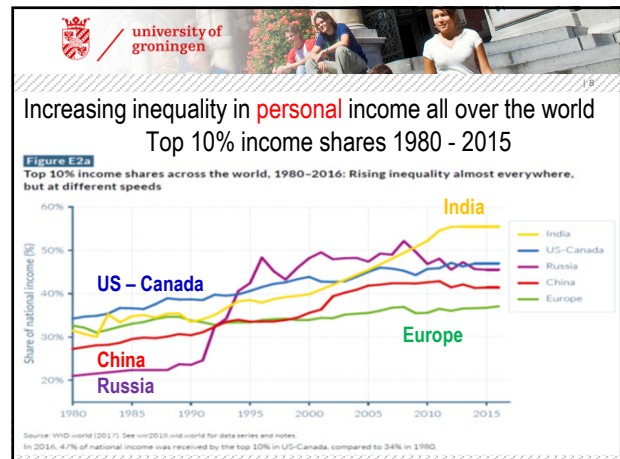
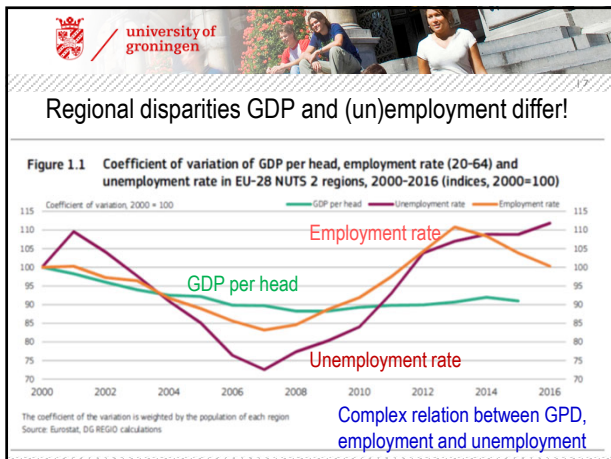
- Economic crisis is over, shortages occur already in some occupations, mismatch education – jobs?
- Population decline and aging: shrinking labour force?
- Regional and urban-rural disparities: increasing role of cities; social and economic risks of climate change
- Increasing inequality in personal income and access to jobs
- Sectoral shifts from agriculture/industry to services
- Increasing knowledge intensity, ICT-revolution, more higher educated, but also a large pool of low-literate people: question of inclusiveness
- Polarisation on the labour market due to automation and robotization: medium level jobs disappear!

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Current trends on regional labour markets (2)

- Flexibilisation (24/7 instead of 9 to 5), more self-employed, more temporary contracts and flexible and/or part time jobs
- Changes competences → 21st century skills, need for life long learning
- Increasing spatial mobility, especially of higher educated: commuting (self driving cars), internal migration, international migration
- Localization and Globalization; off-shoring/resourcing; Brexit, Catalunya; Trade restrictions, etc.
- Decentralisation of labour market policy to regions
- Quality of institutions and governance





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Classic question about regional growth still in debate

Literature: do "jobs-follow-people or people-follow-jobs?" (Borts and Stein 1964; Steinnes and Fisher 1974) or related "chicken-or-egg" (Muth 1971). Later *The Determinants of County Growth* by Carlinio and Mills (1987) with lagged adjustment framework. The question relates:

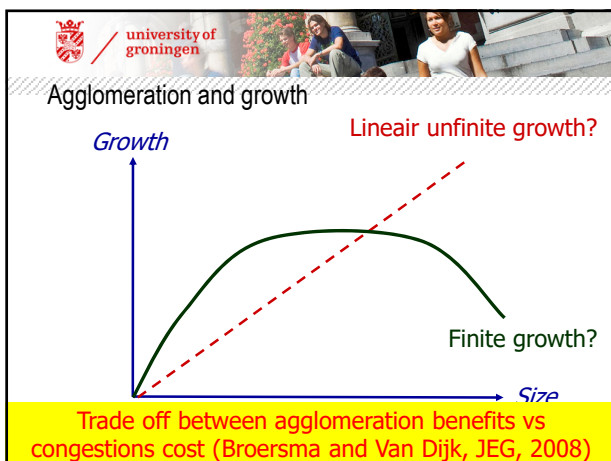
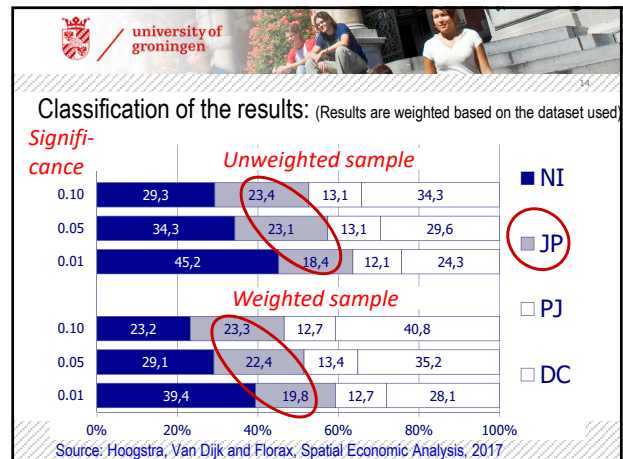
- Do people move for economic factors (jobs) or amenities and quality-of-life factors? (e.g. Lowry, 1966; Partridge 2010). **Borrowed size.**
- Is the residential location decision made before or after the job location decision? (e.g., Deding et al. 2009).
- Are employment locations of firms really exogenous to residential locations? Or vice-versa (as assumed in the monocentric city model)?
- Do these patterns differ by level of education / human capital and change over time with footloose 24/7 jobs and soon by the self-driving car?

Duelling theoretical models and empirical result

- **New Economic Geography** (Krugman, 1991): falling transport cost lead to concentration of people and economic activities
- **Amenity migration** (Graves, mid1970s): people are moving to nice places, warm climates; Storper & Scott (2009): people only move to nice places with suitable employment
- **Agglomeration effects**, attractiveness of (big) cities; high level facilities like universities, hospitals, etc.; cultural amenities like musea, concerts, etc. (Gleaser et al, 2001 etc., Florida, 2003)

→ Partridge (2010): for the US, Graves is the winner!

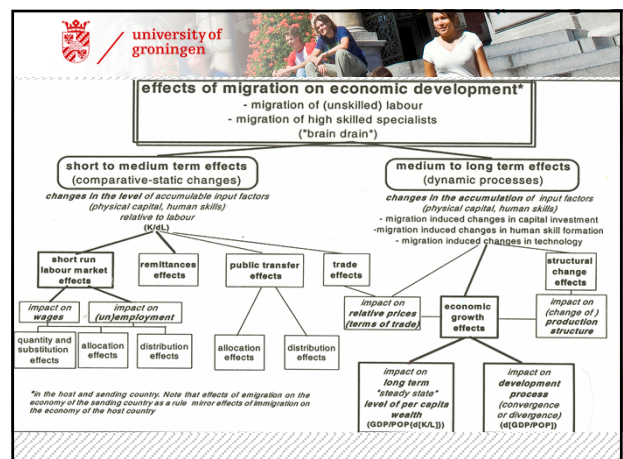
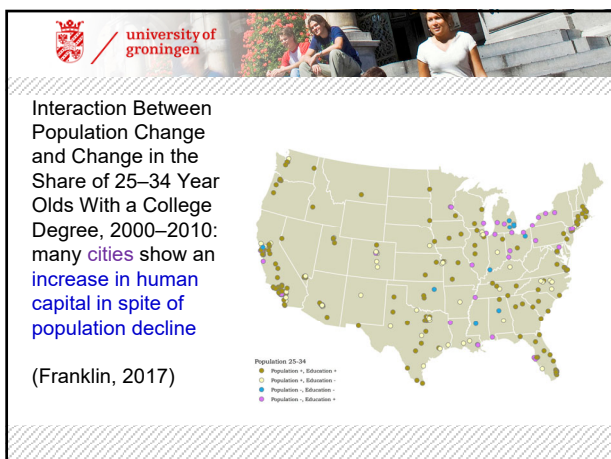
→ Hoogstra, Van Dijk & Florax (2017) find based on a meta-analysis of 321 studies that the results are highly divergent, but that more results point towards "jobs following people" than towards "people following jobs".

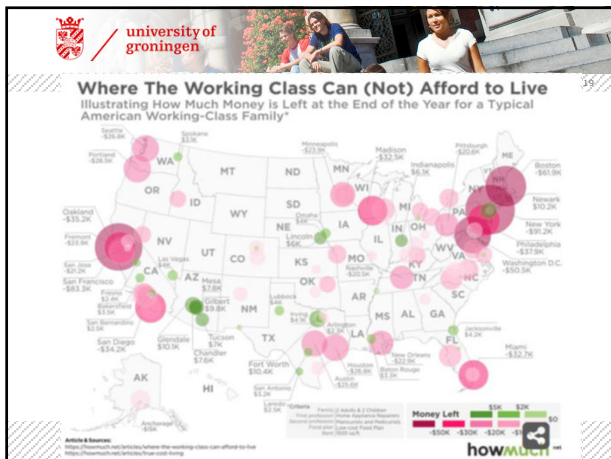


Migration & mobility

- Migration is main determinant of population change
- Higher educated are more mobile and move to bigger cities
- Two out of three people in new EU-countries since 2004 live in a shrinking NUTS 3 region

Source: EU-Commission (2017), 7-th Report on Economic, Social and Territorial Cohesion

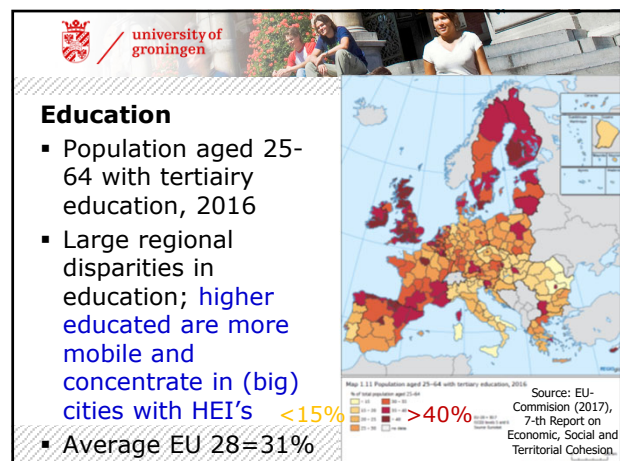
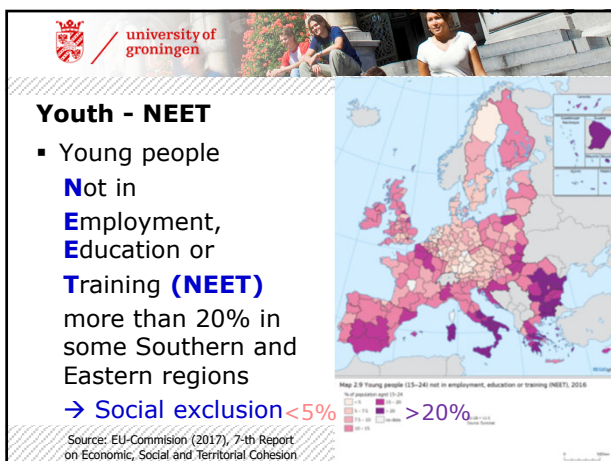
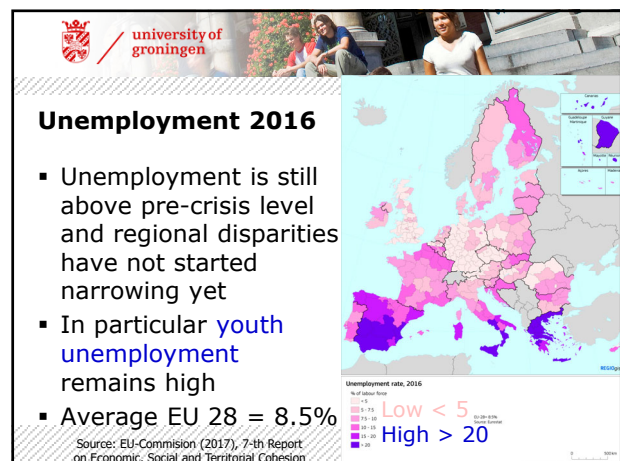
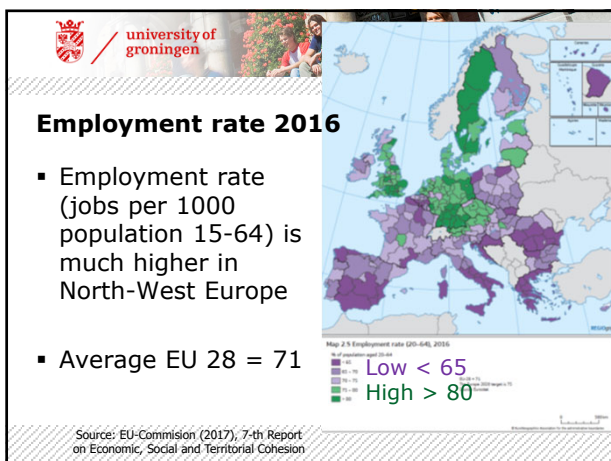




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Policy issues: how to reach full employment?

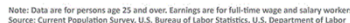
- Human capital is a crucial factor in economic performance for individuals, firms and regions
- The question what determines growth plays a central role in policy discussions: is catering to the wishes of firms by improving the business climate of a place a better strategy than catering to wishes of people and improving the people climate of a place?
- Changing location patterns of firms, changing migration patterns of people, especially of **higher educated** and richer people with changing preferences and rapid technological changes
- Changing policy focus from only economic goals like GDP, income and (un-)employment to broader goals like well-being and quality of life: e.g. OECD-project 'How is life in your region?'





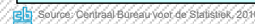
- Human Capital Theory (Sjaastad, 1962) and Job Search Theory (Lippman and McCall, 1976, 1979 and Pissarides, 1976): higher educated have higher wages, lower risks of unemployment; but also better health, higher life expectancy
- Higher educated are more spatially mobile because they have lower (information and psychic) cost and higher returns in terms of future wages. Path-dependency: if they move once, they are more likely to move again: onward moves versus return moves
- In- and outflows of migration are highly correlated: but destination choice has mixed relations with regional differences in wages and unemployment (e.g. Lowry, 1966). Regional differences in cultural and natural amenities and quality of life also play a role (e.g. Graves, 1980)

Unemployment rate in 2014 (%)	Median weekly earnings in 2014 (\$)
5.6	688
5.7	688
5.8	688
5.9	688
6.0	688
6.1	688
6.2	688
6.3	688
6.4	688
6.5	688
6.6	688
6.7	688
6.8	688
6.9	688
7.0	688
7.1	688
7.2	688
7.3	688
7.4	688
7.5	688
7.6	688
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7.9	688
8.0	688
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8.6	688
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8.8	688
8.9	688
9.0	688
9.1	688
9.2	688
9.3	688
9.4	688
9.5	688
9.6	688
9.7	688
9.8	688
9.9	688
10.0	688



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→ not every one can be educated to an academic level!



- Over/under schooling
- Over/under qualified
- Over/under skilled
- Over/under abilities
- Objective – Subjective
- Horizontal – Vertical

TABLE 1. Glossary of terms	
Undereducation	A situation in which an individual has less education than the current job requires (measured in years).
Overeducation	A situation in which an individual has a higher education than the current job requires (measured in years).
Overqualification	A situation in which an individual has a higher qualification than the current job requires.
Overeducation/overqualification	A situation in which an individual has a higher education/qualification than the current job requires.
Undereducation/underqualification	A situation in which an individual has a lower education/qualification than the current job requires.
Underemployment	A situation in which an individual lacks the skills and abilities necessary to perform the current job at acceptable standards.
Overemployment	A situation in which the level of education/qualification is above the level of the education/qualification that performs the job adequately. It makes sense for the employer that the provision of an education/qualification above the level of the job is a waste of resources.
Real remuneration	A situation in which an individual performs more education than the current job requires and also that current skills and abilities are unutilized.
Formal remuneration	A situation in which an individual performs more education than the current job requires, but in which current skills and abilities are fully utilized.
Genuine remuneration	A situation in which an individual has more education than the current job requires, and his or her skills are fully utilized and abilities are fully developed.
Apparent remuneration	A situation in which an individual has more education than the current job requires, but that does not currently allow the level of his or her skills.
SKP shortage	A situation in which there is a large gap that needs to be filled by suitable people with SKP.
SKP surplus	A situation in which the level of suitable people with a particular skill exceeds the demand for it.
SKP gap	A situation in which the level of skills of the currently employed is less than that required to perform the job adequately or the type of skill does not match the requirements of the job.
Economic skills difference	A situation in which skills possessed already by a job no longer required are hence diminished or surpassed.
Physical and mental skills difference	Physical or mental skills and abilities difference that do not require any work.
Verbal/mathematical skills difference	A situation in which the level of education is lower or more than the required level of education or skills.
Horizontal mismatch	A situation in which the level of education or skills matches the requirement, but the type of education or skills is inappropriate for the current job.
Skills mismatch	The mismatch between a obtained by job and education in employee requires is a performance.
Objective measurement	The mismatch between education by evaluating job positions.
The empirical research method	The research intends to reveal the difference in the actual education of an individual within an occupation relative to a desired level of education of all people/occupations that occupation requires. The research method is based on the data of the education level of the individual within a particular occupation and the required level of education for the occupation.
Grounding test	When a particular qualification is based on a degree that has qualified someone could do it, then the grounding test is applied to the qualification. The grounding test is applied to the qualification to determine whether the qualification is based on a degree that has qualified someone could do it, then the grounding test is applied to the qualification. The grounding test is applied to the qualification to determine whether the qualification is based on a degree that has qualified someone could do it, then the grounding test is applied to the qualification.

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Rapidly changing skill requirements for the 21st century

21st Century Skills

- ✓ Creativity
- ✓ Critical Thinking
- ✓ Communication
- ✓ Collaboration
- ✓ Commitment

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Mismatch?

Vertical mismatch: level of education is too high (overeducation) or too low for the job

Horizontal mismatch: level of education is OK, but the type of education not

1. Do we talk about education or skills?
2. Do we talk about the short term (first job) or long term (career)?

But is overeducation also bad from the regional perspective?

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Automation and Robotization: how many jobs will be lost?

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How many jobs will be lost?

- Frey and Osborne (2017): 47% of total US Employment
- Deloitte (2014): 20-30 % of total Dutch jobs
- Koster and Talens (2016): 30% of total Dutch jobs
- Arntz et al. (2016): 9% of total jobs in OECD countries

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McKinsey Global Institute (2017)

A FUTURE THAT WORKS: **AUTOMATION, EMPLOYMENT, AND PRODUCTIVITY**

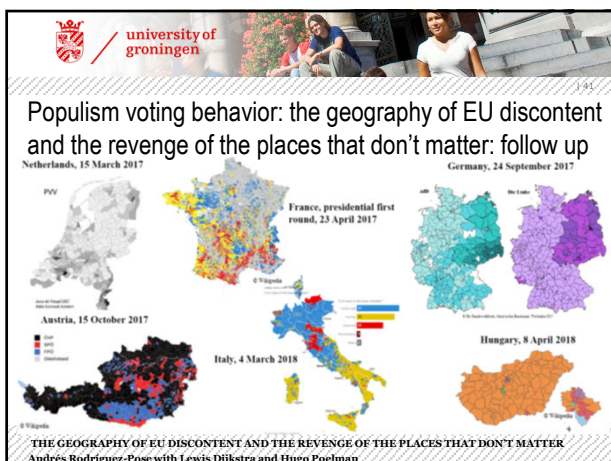
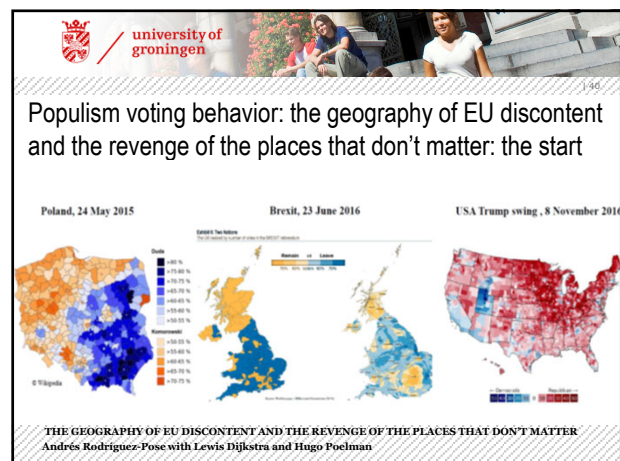
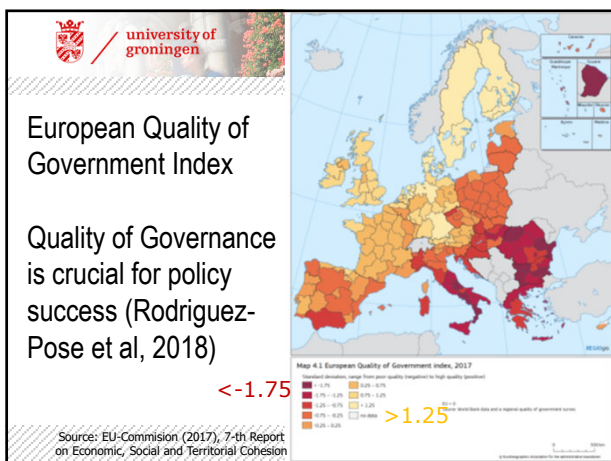
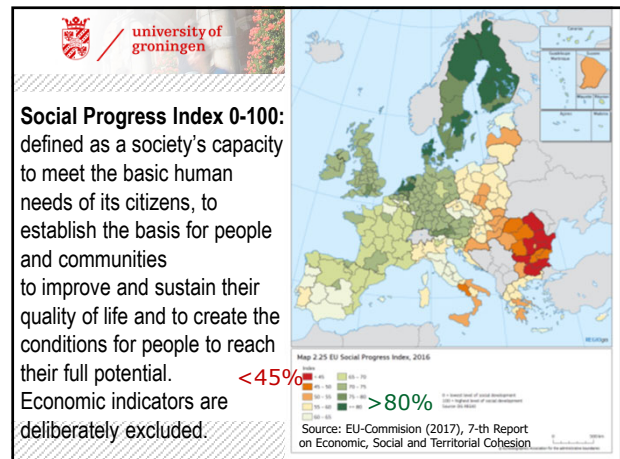
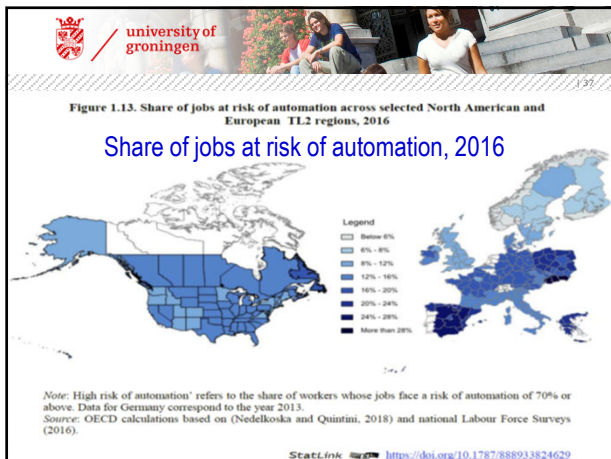
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Labour Market Polarization: middle skilled jobs disappear

Figure 1.10. Change in the share of jobs by skill level
Percentage point change in the share of total employment by type of skills, 1995-2015.

Note: High skill occupations include jobs classified under the ISCO-88 major groups 1, 2, and 3. Middle skilled occupations include jobs classified under the ISCO-88 major groups 4, 7, and 8. Low-skilled occupations include jobs classified under the ISCO-88 major groups 5 and 9. For more details refer to the OECD Employment Outlook 2017.

Source: OECD Employment Outlook 2017 (OECD, 2017b).



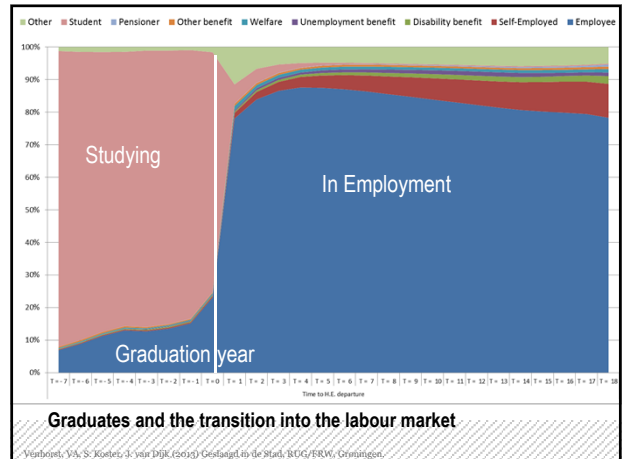
Policy options:

- › Regional level, place based policies on innovation etc.?
- › People oriented policies: investment in education and/or (21st century) skills training?
- › Job creation for low skilled? Direct or indirect as spill-overs from high skilled jobs?
- › Re-organisation of the work organisation: job carving?
- › Influencing the spatial re-allocation of human capital?
- › Detection of promising or risky career patterns?
- › Introduction of an (unconditional) Basic Income?

Exploring three policy options: (Dutch case studies)

1. Influencing the stock of human capital, migration
2. Maximizing spill-over effects of high educated on low educated / low skilled
3. Career intervention: identifying successful and risky career patterns

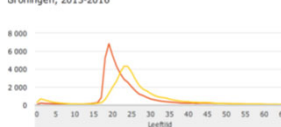
Analysing Graduate Migration Behaviour in the Netherlands using longitudinal (max. 25 years) register micro data (Viktor Venhorst et al)



Most graduates do **not** move or only over (very) short distances, but they concentrate in cities!

Migration patterns to / from city of Groningen

Binnenlandse verhuizingen van en naar de gemeente Groningen, 2013-2016



The escalator-model → redistribution of human capital mainly **within**, but also **between** regions!

Netto migratie van en naar gemeente Groningen, 2013-2016

Meer vestigers in Groningen dan vertrekkers

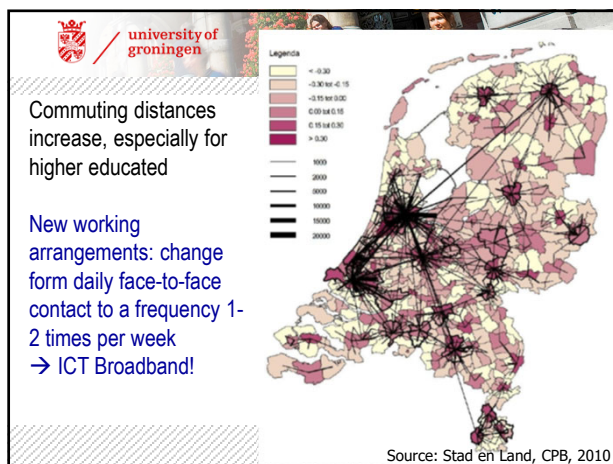
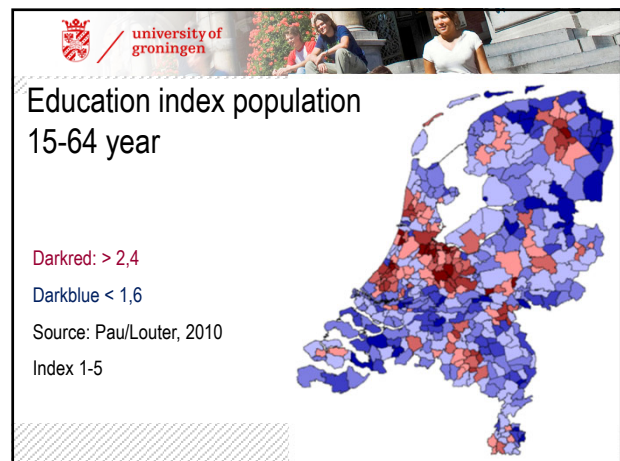
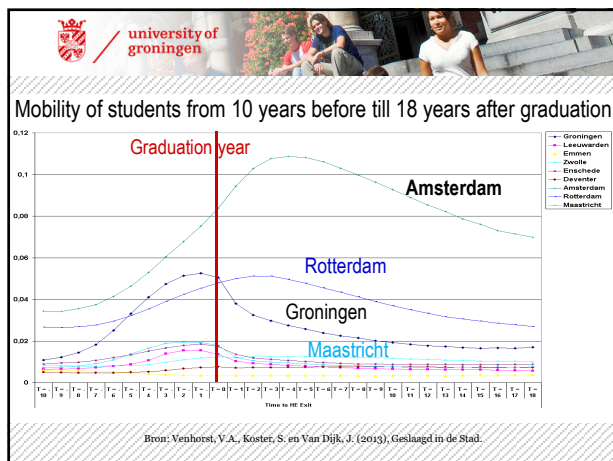
Meer vertrekkers uit Groningen dan vestigers

Net gain for Gr.

Net loss for Gr.

1 10 1000

1 10 1000



Methodology (1)

$$\log(w_{i,f,r,t}) = \alpha + X_{i,f,r,t}\beta + Y_{f,r,t}\gamma + Z_{r,t}\delta + \varepsilon_{i,f,r,t}$$

- $w_{i,f,r,t}$ is the **hourly wage rate of individual** i , working in firm f , which is located in region r , at time t .
- X is a vector of **employee characteristics**, like:
 - gender
 - working hours
 - human capital (HC) → **private rate of return to education**
- Y is a vector of **firm characteristics**, like:
 - industry
 - size
 - **Human Capital firm level** → **production externalities** → **social rate of return**
 - **Distribution low vs. high skilled** → **production externalities** → **social rate of return**
 - **McDonalds type of firm (mostly low skilled) versus Microsoft type of firm high skilled**

Methodology (2)

- Z is the vector of **regional characteristics**, like
 - Urbanisation, Unemployment
 - Human Capital of persons working in region outside firm
 - **production externality**, part of social rate of return to education
 - Human Capital of persons living in region
 - **consumption externality** part of social rate of return to education
- The residuals are represented by ε , α represents the intercept (including fixed effects), β , γ and δ are effect parameters.
- We can distinguish between **educational level of the workers and the skill level of jobs**

Data

- Matched Employer-Employee dataset over 1995-2007. Source: Dutch Ministry of Social Affairs, Working Conditions Survey (WCS)
- Sample of firms in which a stratified sample of employees is drawn, each annual wave approx. 27.000 employees in approx. 2.000 firms
- No panel, but a repeated cross-section
- Rich set of background characteristics of individual employees and firms (gender, working hours, wages, work experience, education, occupational skills, industry, firm size, firm location)
- WCS is based on work location (2-digit zip-code, 90 small regions). WCS is augmented with data on HC of workers living in these 2-digit zip-codes. Latter yields consumption externalities

Results: Human Capital Externalities: all employees

	Dependent variable	Log of hourly wage rate				
		Model	1	2	3	4
Level of education	Education level of individual		0.078**	0.077**	0.078**	0.077**
	Average Education level in region		0.003**			0.003**
	Average Education workers in firm			0.009**		0.009**
	Average Education regional workers excl. firm			-8.7E-04		-0.001
Properties workers	Average Education regional inhabitants 15-64			0.016**	0.015**	0.014**
	Experience		0.044**	0.044**	0.044**	0.044**
	Experience squared		-7.1E-04**	-7.1E-04**	-7.0E-04**	-7.1E-04**
	Female		-0.068**	-0.068**	-0.068**	-0.068**
Properties region	Part-time		0.195**	0.193**	0.195**	0.193**
	Population density		2.1E-05**	2.1E-05**	1.9E-05**	1.8E-05**
	Regional unemployment		-0.512**	-0.523**	-0.521**	-0.516**
	Number of variables		38	39	38	39
	Number of observations		368,541	368,439	368,541	368,439
	Goodness of fit LR test vs OLS		65,490	64,514	65,038	65,032

All specifications include also the following control variables: industry dummies, firm size dummies, year fixed effect dummies.

** significant at the 1% level

Conclusion for the analysis on all employees

- Human capital (HC) stock is years of education
- Private net rate of return to education: **7.8%**
- Social net rate of return to education: **2.3%** of which:
 - **production externalities of education at the firm:** 0.9%
 - **production externalities of education in the region:** 0.0%
 - **consumption externalities of education in the region:** 1.4%

Results: Human Capital Externalities: low educated / low skilled

	Dependent variable: log of hourly wage rate	employees with low education		employees on low skilled jobs	
		coefficient	coefficient	coefficient	coefficient
Level of education	Education of individual	0.035**	0.035**	0.034**	0.035**
	Average education workers in firm	0.019**	0.025**	0.013**	0.002
	Average education regional workers excl. in firm	-0.001	-0.001	-0.003	-0.003
	Average education regional inhabitants aged 15-64	0.012*	0.012**	0.021**	0.019**
Properties workers	Experience	0.046**	0.046**	0.045**	0.045**
	Experience squared	-7.4E-04**	-7.4E-04**	-7.5E-04**	-7.5E-04**
	Female	-0.051**	-0.050**	-0.014**	-0.013**
	Part-time	0.206**	0.205**	0.176**	0.174**
Properties region	Population density	1.4E-05**	1.5E-05**	1.7E-05**	1.6E-05**
	Regional unemployment	-0.377**	-0.392**	-0.509**	-0.470**
Distribution education at firm-level	low and high educated workers		0.040**		
	low vs. high plus scientifically skilled jobs				-0.073**
	Number of variables	40	41	40	41
	Number of observations	188,532	188,532	131,773	131,773
	Goodness of fit LR test vs OLS	33,357	33,328	24,699	24,172

All specifications include also the following control variables: industry dummies, firm size dummies, year fixed effect dummies.

** significant at the 1% level

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Conclusion for the analysis for low educated, low skilled jobs

- Private net rate of return to education for low educated / low skilled jobs substantially lower: **3.5% instead of 7.8%** for all employees
- For **low educated** the Social net rate of return is: **3.7%**
 - production externalities at the firm: 2.5% (0.9% for all)
 - production externalities in the region: 0.0% (0.0% for a;;)
 - consumption externalities in the region: 1.2% (1.4% for all)
 - **Negative effect of distribution of education within Microsoft type firm of -4.0% (but higher main effect!)**
- For **low skilled jobs** the Social net rate of return is: **1.6%**
 - production externalities at the firm: 0.0%
 - production externalities in the region: -0.3%
 - consumption externalities in the region: 1.9%
 - **But large positive effect of distribution of education within Microsoft type firm of 7.7%!**

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Overall conclusions effect of Human Capital Externalities

- An additional year of schooling increases the wage rate of average employees with 7.8% and for low educated / low skilled with 3.5%
→ improve position low skilled by increase in individual education
- Social returns HCE's are about 2.3% for all employees, for low educated 3.7% but for low skilled only 1.6%.
- At the regional level consumption spill overs are significant and more or less equal for all employees and low educated, but higher for low skilled.
- Production/learning spill overs are not significant at the regional level, these take place at the firm level. These effects are larger for low educated workers
- Those with low skilled jobs in firms with many high skilled jobs realize a substantial higher wage: → proximity to many high skilled improves position of workers on low skilled jobs. For low skilled workers the opposite is true, but the effect is smaller and compensated by a higher main effect.

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Analyzing career paths by means of **sequence analysis**

Publication: Middeldorp, Marten, Arjen J.E. Edzes and Jouke van Dijk (2016). 'Smooth Transition? Upper-Secondary General versus Vocational Education and the Transition from School to Work'. *European Sociological Review*. Accepted for publication October 18, 2018.

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Types of Active Labour Market Policies

		Investment in human capital		
		None	Weak	Strong
Pro-market employment orientation	Weak	(Passive benefits) Basic income?	Occupation Job creation schemes in the public sector Training programmes unrelated to employment	(Basic education)
	Strong	Incentive reinforcement Tax credits, in work benefits Time limits on benefit receipt Benefit reductions Benefits conditionality	Employment assistance Placement services Job subsidies Counselling Job search programmes	Upskilling Job-related vocational training

Source: Bot

Succes of Active Labour Market Policies is very limited!

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Table 2. Division of instruments by client typology

	Distance to regular jobs:					
	NO			YES		
				Bridgeable	Non-bridgeable	
Problems	No jobs	No motivation	No match	Skills shortage / wrong skills Need for re-integration	Able to work but low productivity	Not bridgeable
Instruments	Employment creation Job Carving	Control Incentives and sanctions	Information Counselling Mediation	Training Education	Wage subsidy Workplace adjustment	Sheltered employment Benefits

Need for identification of successful career interventions!

Basic income?

university of groningen

Research questions

"How can we identify typical career patterns in relate this to personal and regional characteristics?"

Approach

- Longitudinal data and **sequence analysis** to create and analyse career sequences from the onset of unemployment
- Estimation of the effect of local labour market opportunities and human capital on the probability of following particular pathways

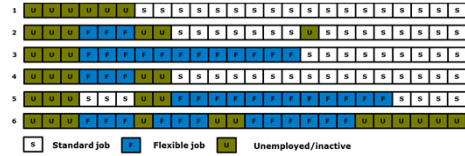


Aim

- To identify labour market trajectories that account for all states experienced during the first three years after the onset of unemployment
- To explore and describe e.g. resilient after-unemployment trajectories; school-to-work transition; migration / commuting patterns of higher educated graduates
- To analyze and compare effects of local labour market opportunities and human capital on career resilience to unemployment



Identifying career trajectories: detailed monthly data

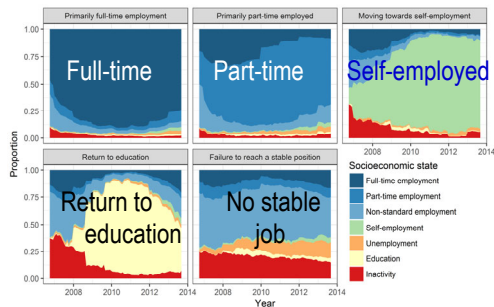


How similar are the sequences of individuals?

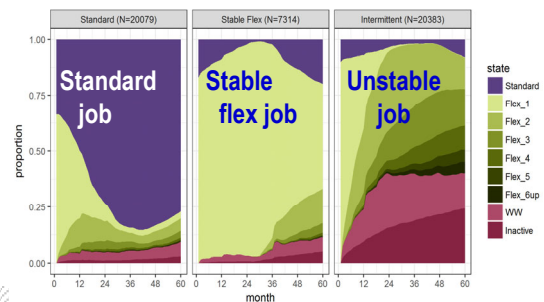
- Calculate metric distances between each pair of sequences
- Result: distance matrix for each pair of sequences



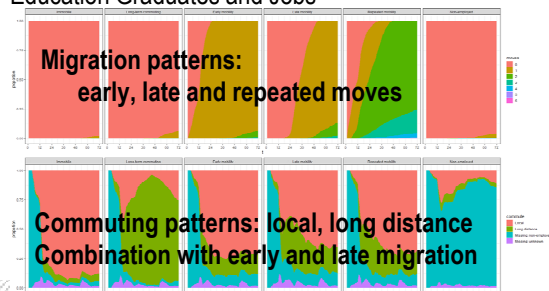
Career trajectories: school to work transitions



Career trajectories after becoming unemployed



Career trajectories: Spatial Mobility of Higher Education Graduates and Jobs



Next step: explain the career trajectories

- Multinomial logistic regression, average marginal effects
- Dependent variable: trajectory entered
- Explanatory variables:
 - Local labour market opportunities: job access, unemployment
 - Human capital: education, experience, last wage
 - Controls: sex, age, migrant, household, child, last working time
- Fixed effects: time, region



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John Maynard Keynes prediction in 1930

In the summer of 1930, at the start of the Great Depression, John Maynard Keynes gave a speech in Madrid entitled «Economic Possibilities for our Grandchildren». He stated that, over time, humankind was solving its economic problems thanks to the process of capital accumulation. He predicted that the standard of living in progressive countries would, in one hundred years, be between four and eight times higher than it was in 1930, and that the standard working week would be fifteen hours. An important societal problem foreseen in Keynes' prediction would be how to spend leisure time (Keynes, 1963).

→ We still have a problem of unemployment and social exclusion



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Conclusions and Policy Implications for individuals:

- Human capital is a crucial success factor in economic performance for individuals, firms and regions and also in social and health issues. Education is not the same as (21st century) skills. Policy options are limited by low spatial mobility of human capital and restrictions in learning capacity. Changing the work organization (job carving) is an alternative option, but requires action of the firm. Basic income?
- Low skilled can benefit from spill-overs of high skilled. Policy options are limited by lack of insights in the type of spill-over mechanism via consumption at the regional and productivity/learning at the firm level.
- Career patterns vary with personal and regional circumstances and are path dependent. Policy options are limited by lack of insight in successful paths and successful interventions. Analysis of register data + sequence analysis might help + Quality of Governance



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Conclusions and Policy Implications for regions:

- Higher educated graduates are the most spatially mobile group in the labour market, especially in the years before and after graduation. But: also most of them stay in the home region. It leads to a redistribution of human capital within regions, but also between regions; impacts on inequality is unclear: complex processes
- If they leave: brain drain or clean export product? Higher education institutes (HEI's), like universities are boosters of the regional economy, even if graduates leave the region after study
- If they stay: underutilization of human capital investment beneficial for the region and low educated due to positive production and consumption externalities, entrepreneurship, quality of governance
- Policy implication: stimulate private and public investment in education because it is *always* beneficial both for individuals and regions in terms of economic performance, but also in terms of well-being.



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Thank you for your attention

RUG1



Human Capital, Regional Economic Development and Inequality

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