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).

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!

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/reshoring; Brexit, Catalunya; Trade restrictions, etc.
• Decentralisation of labour market policy to regions
• Quality of institutions and governance

Regional disparities GDP per capita across OECD 2000-2016

GDP per capita and growth 2000-2015: convergence is driven by the poorest “low income” regions
Regional disparities GDP and (un)employment differ!

Complex relation between GDP, employment and unemployment.

Increasing inequality in personal income all over the world

Top 10% income shares 1980 - 2015

Increasing inequality in personal income all over the world

Top 10% income shares 1980 - 2015

Income inequality: top 1% versus bottom 50% in EU and US

The elephant curve of inequality in real income growth

Bottom 50% captured 12% of total growth, top 1% captures 27%!
Squeezed Bottom 90% in US and Western Europe

Knowledge capital and economic growth for countries

How about regions?

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 Carlino 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?
Dueling theoretical models and empirical results:

- **New Economic Geography (Krugman, 1991)**: falling transport cost lead to concentration of people and economic activities.
- **Amenity migration (Graves, mid-1970s)**: 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 museums, 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".

### Classification of the results:

<table>
<thead>
<tr>
<th>Significance</th>
<th>Unweighted sample</th>
<th>Weighted sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10</td>
<td>29.4</td>
<td>13.1</td>
</tr>
<tr>
<td>0.05</td>
<td>20.1</td>
<td>12.4</td>
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<tr>
<td>0.01</td>
<td>15.1</td>
<td>12.1</td>
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<tr>
<td>0.005</td>
<td>34.3</td>
<td>29.6</td>
</tr>
<tr>
<td>0.001</td>
<td>45.2</td>
<td>24.3</td>
</tr>
</tbody>
</table>

*Source: Hoogstra, Van Dijk and Florax, Spatial Economic Analysis, 2017*

### Agglomeration and growth

- **Growth**: Linear infinite growth?
- **Finite growth?**

*Source: Broersma and Van Dijk, JEG, 2008*

### 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.


### Interaction Between Population Change and Change in the Share of 25–34 Year Olds With a College Degree, 2000–2010:

- Many cities show an increase in human capital in spite of population decline.

*Source: Franklin, 2017*
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?’

Employment rate 2016

- Employment rate (jobs per 1000 population 15-64) is much higher in North-West Europe
- Average EU 28 = 71


Unemployment 2016

- Unemployment is still above pre-crisis level and regional disparities have not started narrowing yet
- In particular youth unemployment remains high
- Average EU 28 = 8.5%


Youth - NEET

- Young people Not in Employment, Education or Training (NEET) more than 20% in some Southern and Eastern regions
  - Social exclusion < 5% > 20%


Education

- Population aged 25-64 with tertiary education, 2016
- Large regional disparities in education; higher educated are more mobile and concentrate in (big) cities with HEI’s
- Average EU 28 = 31%
The individual benefits of investing in human capital

- 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)

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Share of workers with low literacy and/or numeracy skills varies from 10 – 60%

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

Mismatch: what are we talking about?
- Over/under scholing
- Over/under qualified
- Over/under skilled
- Over/under abilities
- Objective – Subjective
- Horizontal - Vertical

Rapidly changing skill requirements for the 21st century

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?

Automation and Robotization: how many jobs will be lost?

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

Labour Market Polarization: middle skilled jobs disappear

› A FUTURE THAT WORKS: AUTOMATION, EMPLOYMENT, AND PRODUCTIVITY
Social Progress Index 0-100: defined as a society’s capacity to meet the basic human needs of its citizens, to establish the basis for people and communities to improve and sustain their quality of life and to create the conditions for people to reach their full potential. Economic indicators are deliberately excluded.

European Quality of Government Index
Quality of Governance is crucial for policy success (Rodriguez-Pose et al, 2018)

Populism voting behavior: the geography of EU discontent and the revenge of the places that don’t matter: follow up

Policy problem:
› Decreasing inequalities between regions in terms of GDP: lowest income regions are catching up.
› But: still increasing inequalities in terms of (un)employment rates, human capital: urban regions do better than most rural areas.
› Increasing differences in personal income. Elephant curve: the top 1% rich people and the poor benefit most. Medium squeezed.
› Human capital is rather sticky: high educated are most mobile and move to (big) cities for jobs, but also for amenities. Mostly: jobs follow people.
› Medium skilled jobs disappear due to automation/robotization. Low educated, low skilled are in trouble. Problem of dropouts (NEET) and limitations of (life long) educating.
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!

The escalator-model → redistribution of human capital mainly within, but also between regions!
Urban level externalities of education: 

Production vs. consumption externalities to education: 
Learning spell-overs vs. expenditure spill-overs / Lucas (1988) vs. Sassen (2001)

Spill-overs from high to low skilled at the regional level: 
Multiplier effects / Moretti (2012); Van Dijk (2016, 2018)

Proximity of low and high skilled at the firm level: 
Learning spill-overs / Lucas (1988); Homfeld effect / Malmberg et al. (2008)
Methodology (1)

\[ \log(w_{i,f,r}) = \alpha + X_{i,f,r}^\top \beta + Z_{r}^\top \gamma + \epsilon_{i,f,r,2} \]

1. \( w_{i,f,r} \) is the hourly wage rate of individual \( i \), working in firm \( f \), which is located in region \( r \), at time \( t \).
2. \( X \) is a vector of employee characteristics, like:
   - gender
   - working hours
   - Human Capital (HC) \( \rightarrow \) private rate of return to education
3. \( Y \) is a vector of firm characteristics, like:
   - industry
   - size
   - Human Capital firm level \( \rightarrow \) production externalities \( \rightarrow \) social rate of return
4. Distribution low vs. high skilled \( \rightarrow \) production externalities \( \rightarrow \) social rate of return
5. McDonalds type of firm (mostly low skilled) versus Microsoft type of firm (mostly high skilled)
6. We can distinguish between educational level of the workers and the skill level of jobs

Methodology (2)

4. \( z \) is the vector of regional characteristics, like:
   - Urbanisation, Unemployment
   - Human Capital of persons working in region outside firm
   - Human Capital of persons living in region
   - consumption externality \( \rightarrow \) social rate of return to education
5. The residuals are represented by \( \epsilon \), \( z \) represents the intercept (including fixed effects), \( \beta, \gamma, \delta \) are effect parameters.
6. We can distinguish between educational level of the workers and the skill level of jobs

Data

- 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-dgit 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

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Log of hourly wage rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education level of individual</td>
<td>-0.001** 0.001 0.007 0.009 0.007</td>
</tr>
<tr>
<td>Average Education level of region</td>
<td>0.001 0.009 0.003 0.009** 0.009**</td>
</tr>
<tr>
<td>Average Education workers in firm</td>
<td>-0.001 -0.001 -0.001 -0.001 -0.001</td>
</tr>
<tr>
<td>Average Education regional residing firm</td>
<td>0.001 0.001 0.001 0.001 0.001</td>
</tr>
<tr>
<td>Properties workers</td>
<td></td>
</tr>
<tr>
<td>Experience</td>
<td>-0.001** -0.001** -0.001** -0.001** -0.001**</td>
</tr>
<tr>
<td>Experience squared</td>
<td>-0.001** -0.001** -0.001** -0.001** -0.001**</td>
</tr>
<tr>
<td>Female</td>
<td>-0.001** -0.001** -0.001** -0.001** -0.001**</td>
</tr>
<tr>
<td>Part-time</td>
<td>-0.001** -0.001** -0.001** -0.001** -0.001**</td>
</tr>
<tr>
<td>Properties region</td>
<td></td>
</tr>
<tr>
<td>Population density</td>
<td>-0.001 -0.001 -0.001 -0.001 -0.001</td>
</tr>
<tr>
<td>Regional unemployment</td>
<td>0.001** 0.001** 0.001** 0.001** 0.001**</td>
</tr>
<tr>
<td>Number of variables</td>
<td>38 38 38 38 40</td>
</tr>
<tr>
<td>Number of observations</td>
<td>368,541 368,439 368,541 368,541 368,439</td>
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Results: Human Capital Externalities: low educated / low skilled

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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%
- Methodology (1)

Results: Human Capital Externalities: high educated / high skilled

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</table>
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 all)
  - 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 7.1%.

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.

Analyzing career paths by means of sequence analysis


Types of Active Labour Market Policies

<table>
<thead>
<tr>
<th>Investment in human capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>Basic income?</td>
</tr>
</tbody>
</table>

Pro-market employment orientation

- Basic income?
- Investment in human capital
- Weak (Passive benefits)
- Basic income
- Occupation
- Training programmes unrelated to employment
- Strong (Basic education)
- Employment assistance
- Placement services
- Low-skilled training
- Upskilling
- Job-related vocational training

Research questions

“Can we identify typical career patterns in relation 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
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).

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

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 (HEIs), 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.

Thank you for your attention

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