Brain Drain or Brain Gain?

Graduate Migration in Old Industrial Regions – Analysis of the Central Lower Rhine Area, Germany

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Angelika Jaeger, Fabian Kreutzer
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1. Introduction

2. Graduate Migration Patterns and Determinants

3. Discussion and Conclusion
1. Introduction

**Academic literature tells us:**

- Human capital is a key indicator of regional economic and innovation performance
  - Patterns of regional “brain flows” are key determinants for the development of the human capital level

- Migration is a well-analyzed research topic on a macro level
  - Additional information can be gained with graduate migration analysis on a small-scale regional level
1. Introduction

Study Region: Central Lower Rhine Area (CLRA)

Figure 1: adapted from IHK Mittlerer Niederrhein, 2012
1. Introduction

What are central characteristics of the Central Lower Rhine Area (CLRA)?

- Old Industrial region, structural changes
- Rather peripherical, close to the border
- On the rim of a congested urban area with several prospering metropolises → pull factor!

The CLRA faces diverse challenges

- Economic problems, above-average unemployment
- High municipal debts
- Below-average percentage of university graduates employed
- 38% of regional companies claim a shortage of skilled labour

→ A university is a vital chance for the region!
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2. Graduate Migration Patterns and Determinants  
NR UAS Graduate Survey 2012, N = 1769 (max. 2 years after grad.)

<table>
<thead>
<tr>
<th>Origin in CLRA</th>
<th>No Migration after graduation</th>
<th>Migration after graduation</th>
<th>∑</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Migrants</td>
<td>15.0 %</td>
<td>Late Migrants 15.5 %</td>
<td>30.5 %</td>
</tr>
</tbody>
</table>

| Origin in any other region | University Stayers 11.5 % | Repeat Migrants 58.0 % | 69.5 % |

| ∑ | 26.5 % | 73.5 % | 100 |

→ Brainflow Balance – 4.0 %
2. Graduate Migration Patterns and Determinants

**Descriptive Analysis: Interesting results concerning migration determinants:**

- Migration propensity differs considering **different fields of study**
- **A temporary stay abroad:** does not alter frequency of graduate migration, but generally raises the migration distance
- **Duration of Job Seeking:** Graduates, who stay in the region, find jobs faster
- **Starting salary:** A high starting salary seems to act as pull factor to other regions
- **Form of job contract:** below-average migration propensity for job contracts of lower attractiveness
2. Graduate Migration Motives

Only two important migration motives:

- Starting first job in Central Lower Rhine Area (CLRA): 62% (Job-related motives), 46% (Personal/family-related motives) vs. 66% (Migration to other Areas)
- Further studies/PHD program: 14% (Job-related motives), 7% (Personal/family-related motives) vs. 5% (Migration to other Areas)
- Cost of living: 5% (Job-related motives), 1% (Personal/family-related motives) vs. 8% (Migration to other Areas)
- CLRA Recreation Facilities/Amenities: 4% (Job-related motives), 12% (Personal/family-related motives) vs. 16% (Migration to other Areas)
- CLRA Image: 16% (Job-related motives), 6% (Personal/family-related motives) vs. 9% (Migration to other Areas)
- CLRA Accessibility/Infrastructure: 26% (Job-related motives), 9% (Personal/family-related motives) vs. 6% (Migration to other Areas)
- Other reasons: 20% (Job-related motives), 5% (Personal/family-related motives) vs. 14% (Migration to other Areas)
2. Graduate Migration Determinants and Motives
Econometric Approach

\[ \text{Migration} = \beta_0 + \beta_1 \text{RegOrigin}_i + \beta_2 \text{UniversityEntrance}_i + \beta_3 \text{Apprenticeship}_i + \beta_4 \text{Gender}_i \\
- \beta_5 \text{TempStayAbroad}_i - \beta_6 \text{JobSeeking}_i - \beta_7 \text{industry}_i - \beta_8 \text{retail}_i - \beta_9 \text{SME}_i \\
+ \beta_{10} \text{SelfEmployed}_i + \beta_{11} \text{PersonalReasons}_i + \beta_{12} \text{JobReasons}_i + \beta_{13} \text{Textile}_i \\
+ \beta_{14} \text{Economics}_i + \mu \]

- **Migration**: dummy, 1 = graduate starts professional life in CLRA
- **RegOrigin**: dummy, 1 = university entrance diploma in CLRA
- **University Entrance**: form of university entrance diploma
- **Apprenticeship, Temporary stay abroad**: dummy, 1 = yes / 0 = no
- **Gender**: dummy, 1 = female
- **Duration of Job seeking** in months
- **Industry, retail and SME**: dummy, 1 = graduate started professional life in company operating in industrial branches, in retail industry, respectively as SME
- **SelfEmployed**: dummy, 1 = graduate is self-employed
- **Personal Reasons and Job Reasons**: dummy, 1 = graduate identified migration motive
- **Textile and Economics**: dummies, field of study (1 = graduate of corresponding faculty)
### 2. Graduate Migration Determinants and Motives

**Econometric Approach**

Regression results for binomial model with random error term

Dependent variable: *Migration*, 1 = Graduate starting professional life in CLRA

*** denotes significance at the 0.01 level

|                                  | Coeff. | Std. Err. | P>|z| |
|----------------------------------|--------|-----------|-----|
| Regional origin***               | 0.79   | 0.19      | 0.000 |
| University Entrance diploma      | 0.33   | 0.58      | 0.574 |
| Apprenticeship                   | -0.02  | 0.18      | 0.906 |
| Gender: Female                   | -0.19  | 0.20      | 0.453 |
| Temporary Stay Abroad            | 0.29   | 0.28      | 0.242 |
| Job-Seeking                      | -0.05  | 0.03      | 0.102 |
| Industry                         | -0.20  | 0.21      | 0.327 |
| Retail Market                    | 0.54   | 0.33      | 0.106 |
| SME                              | -0.04  | 0.20      | 0.830 |
| Self-Employed                    | 0.00   | 0.30      | 0.998 |
| Personal & Family-Related Reasons*** | 1.39 | 0.19      | 0.000 |
| Job-Related Reasons***           | 0.73   | 0.20      | 0.000 |
| Faculty Textile & Clothing Management | 0.20 | 0.27      | 0.466 |
| Faculty Business Administration & Economics | 0.07 | 0.20 | 0.710 |
| cons                             | -2.32  | 0.33      | 0.000 |

Participants: 369, alumni network survey

LR chi² (14)= 93.76

Prob> chi² = 0.000

Pseudo R²= 0.2637

**Database:** Online survey of alumni network 2012, N = 475
2. Graduate Migration Determinants and Motives

Results of Empirical Analysis:

1. The university catchment area is very regionally oriented
2. NR UAS exhibits a negative brainflow-balance
3. The propensity of migration is much higher for external students
4. Two important migration motives: job-related and family-related/personal reasons
5. Minor or no significance in the migration decision process: graduate’s international experience, self-employment, soft locational factors of the university region
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3. Discussion

The three roles of HEI:

1. HEI as source of academic knowledge

2. HEI as provider of academic education

3. HEI as regional system builder
   → Especially important in old industrial regions facing economic challenges
   → Concerning graduation migration policy, how can NR UAS act as regional system builder?

Source: Caniëls / von den Bosch 2010, p. 274
3. Discussion

1. The university can embrace and support a role as „employment broker“:

How did you find your first job after graduation?

- 39%: Connection via university / studies
- 34.5%
- 25%
- 20%
- 18.0%
- 15%
- 13.3%
- 12.2%
- 10.4%
- 11.6%
- 3.6%
- 1.7%
- 0%

- Part-time Employment during studies
- Internship
- Final Thesis
- Contact by lecturing tutors
- Job advertisement
- Personal Contacts
- Speculative Application
- Jobcenter (Agentur für Arbeit)
3. Discussion

2. The university can improve graduates’ knowledge about possible local employers

<table>
<thead>
<tr>
<th>Knowledge of local economy and possible future employers</th>
<th>Complete knowledge</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>No knowledge</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would have stayed in the CLRA given a better job offer</td>
<td>Yes</td>
<td>14</td>
<td>128</td>
<td>159</td>
<td>138</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>10</td>
<td>37</td>
<td>89</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>Migrating graduates</td>
<td></td>
<td>24</td>
<td>165</td>
<td>248</td>
<td>223</td>
<td>122</td>
</tr>
</tbody>
</table>
3. Discussion

3. The university needs to underline its importance for local companies

Local companies evaluate NR UAS as good, but unimportant location factor concerning „labour and qualification“

Source: Survey of Chamber of Commerce and Industry, 2012; scale from 1 (highest value) to 5 (lowest)
3. Conclusion

For old industrial regions facing economic problems...

... a HEI is a vital chance for the development of human capital
... high importance of graduates who can be attracted to the region in the long run
... pull-factor of well-performing regions has to be faced
  → additional advantages have to be offered
  → regionally originated students are easier „to keep“ in the region

To improve the level of regional human capital, a HEI can...
... embrace and support a role as „employment broker“.
... improve graduates’ knowledge about possible local employers
... needs to underline its importance for local companies
Thank you for your attention!


Appendix – Additional Information

Analysis based on three graduate surveys in 2012

1. Official university graduate survey
   Online, Conducted in a biannual interval rhythm, N=1700

2. Survey of Alumni networks
   Online questionnaire, N=475

3. Survey of students in final semester
   → Possibility to compare migration plans with actual migration patterns, N = 225
2. Graduate Migration Patterns and Determinants
Online Survey of Alumni Network, N = 475 (no time limit after grad.)

<table>
<thead>
<tr>
<th></th>
<th>No Migration after graduation</th>
<th>Migration after graduation</th>
<th>Σ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Origin in CLRA</strong></td>
<td>Non Migrants 12.4 %</td>
<td>Late Migrants 30.5 %</td>
<td>42.9 %</td>
</tr>
<tr>
<td><strong>Origin in any other region</strong></td>
<td>University Stayers 6.2 %</td>
<td>Repeat Migrants 50.9 %</td>
<td>57.1 %</td>
</tr>
<tr>
<td><strong>∑</strong></td>
<td>18.6 %</td>
<td>81.4 %</td>
<td>100</td>
</tr>
</tbody>
</table>

→ Brainflow Balance – 24.3 %
International Experience…

- has no influence on migration probability
- but raises the distance range of migrating graduates
Appendix – Additional Information

Graduates accept contracts of lower attractiveness to remain in the region

Migration probability considering characteristics of the job contract

<table>
<thead>
<tr>
<th>Category</th>
<th>Central Lower Rhine Area</th>
<th>Within rest of NRW</th>
<th>Within rest of Europe</th>
<th>Worldwide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>26.4%</td>
<td>24.9%</td>
<td>32.5%</td>
<td>43.0%</td>
</tr>
<tr>
<td>Permanent employment contract</td>
<td>26.4%</td>
<td>24.9%</td>
<td>32.5%</td>
<td>43.0%</td>
</tr>
<tr>
<td>Fixed-term employment contract</td>
<td>26.4%</td>
<td>24.9%</td>
<td>32.5%</td>
<td>43.0%</td>
</tr>
<tr>
<td>Full-time job</td>
<td>24.5%</td>
<td>43.0%</td>
<td>24.5%</td>
<td></td>
</tr>
<tr>
<td>Part-time job</td>
<td>24.5%</td>
<td>43.0%</td>
<td>24.5%</td>
<td></td>
</tr>
</tbody>
</table>

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Appendix – Additional Information

High Starting Salaries are a Pull Factor

Migration Probability considering the starting salary of graduates

- Central Lower Rhine Area
- Within rest of NRW
- Within rest of Europe
- Worldwide

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Appendix – Additional Information

Attractiveness of economic regions in North-Rhine-Westphalia based on a survey of MINT graduates

<table>
<thead>
<tr>
<th>Region</th>
<th>Nutzenwert / Attraktivität</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region Aachen</td>
<td>0,02</td>
</tr>
<tr>
<td>Region Köln/Bonn</td>
<td>0,35</td>
</tr>
<tr>
<td>Region Niederrhein</td>
<td>-0,06</td>
</tr>
<tr>
<td>Region Düsseldorf</td>
<td>0,22</td>
</tr>
<tr>
<td>Bergisches Städtedreieck</td>
<td>-0,35</td>
</tr>
<tr>
<td>Südwestfalen</td>
<td>-0,31</td>
</tr>
<tr>
<td>Metropole Ruhr</td>
<td>0,24</td>
</tr>
<tr>
<td>Ostwestfalen-Lippe</td>
<td>-0,26</td>
</tr>
<tr>
<td>Münsterland</td>
<td>0,15</td>
</tr>
</tbody>
</table>
1. Introduction

Universities induce expenditure effects, knowledge spillovers, produce human capital

To support the University Region → Importance of local focus

- Socio-Cultural Impacts
- Knowledge and Technology Transfer
  - Human Capital
    - Spin Offs
    - R&D Transfer
- Expenditure Effects
  - Higher Education Institution
  - Students
  - Staff
- Quality of Location
- Region