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# The Heterogeneous Effects of Workers' Countries of Birth on Over-education

November 14<sup>th</sup>, 2019

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## IMMIBEL Project:

- Improving the Labour Market Position of People with a Migration background in Belgium
- Naar een betere arbeidsmarktpositie voor mensen met een migratieachtergrond
- Améliorer la situation des personnes d'origine étrangère sur le marché du travail

# Introduction

Immigrants are more likely to be over-educated than native workers (Chiswick and Miller, 2009; Dell'Aringa and Pagani, 2011; Aleksynska and Tritah, 2013; Matano *et al.*, 2015).

- **Discrimination** (e.g. Chiswick and Miller, 2009; Matano *et al.*, 2015).
- **Imperfect transferability of human capital** (e.g. Kalfa and Piracha, 2013; Dean, 2018).

Over-education: Educational attainment  $>$  educational requirement.

# Contribution

1<sup>st</sup> contribution – Define educational mismatch in quite detailed manner, i.e. by using the “realized matches method (RM)”:

- RM: Compute the mean (Verdugo and Verdugo, 1989) or the mode (Kiker *et al.*, 1997) of education levels by occupation.
- We use the mode of education levels (ISCED: 7 categories) by
  - Occupation (ISCO3: 150 categories).
  - Age groups (14-29, 30-49, 50+).
  - Sector (NACE1 rev2: 13 categories).
- This represents 5,420 categories instead of 150.
- Restriction to: occupation-sector-age cells with at least 10 observations.

# Contribution

Existing studies mainly consider immigrant workers:

- as a whole (e.g. Fang and Wald, 2008; Chiswick and Miller, 2009; Dell'Aringa and Pagani, 2011; Maani and Wen, 2018).
- in a very broad classification (e.g. Green *et al.*, 2007; Kler, 2007; Byrne and McGuinness, 2014; Dean, 2018).

2<sup>nd</sup> contribution – Categorize immigrants using first the UN classification and then more disaggregated geographical areas:

- Have a large sample of immigrants (namely, 138,227).

Developed countries	Developing countries	Countries in transition
North America and South Pacific	Asia	Eastern Europe (non-EU) (e.g. Albania, Armenia, Kazakhstan, Kosovo, Russia, Serbia).
Western Europe	Latin and Central America	
Eastern Europe (EU-13)	Maghreb	
Japan	Middle and Near East	
	Sub-Saharan Africa	

3<sup>th</sup> contribution – Examine the potential roles played by the following key moderating factors:

- Education.
- Gender.
- Time spent in the host country:
  - Tenure (i.e. the number of years an employee has been working for her/his current employer).
  - Citizenship acquisition.

# Contribution

4<sup>th</sup> contribution – Control for many worker, job and firm characteristics.

- Worker characteristics:
  - gender (1 dummy).
  - education (2 dummies).
  - tenure (1 dummy).
- Job characteristics:
  - part-time (1 dummy).
  - contract (3 dummies).
- Firm characteristics:
  - regions (2 dummies).
  - size (2 dummies).
  - public ownership (1 dummy).
  - firm-level collective agreement (1 dummy).
- Years (11 dummies).

# Purpose

1. Are immigrants more likely to be over-educated on the Belgian labour market? If so, which ones and to what extent?
2. How much do the following moderating variables matter?
  - a) Being tertiary educated.
  - b) Being a women.
  - c) Having more than 10 years of tenure.
  - d) Being naturalised.



# Methodology: Determinants of educational mismatch

We use an ordered probit model to estimate the probability of a worker being over-, adequately or under-educated in her/his job:

$$\begin{aligned} & \Pr(\textit{under educated}_i = 0) \\ &= \Pr(\beta_{1i}\textit{country of birth}_i + \beta_{2i}\textit{covariates}_i + \mu_i < \textit{cut1}) \end{aligned}$$

$$\begin{aligned} & \Pr(\textit{adequately educated}_i = 1) \\ &= \Pr(\textit{cut1} < \beta_{1i}\textit{country of birth}_i + \beta_{2i}\textit{covariates}_i + \mu_i < \textit{cut2}) \end{aligned}$$

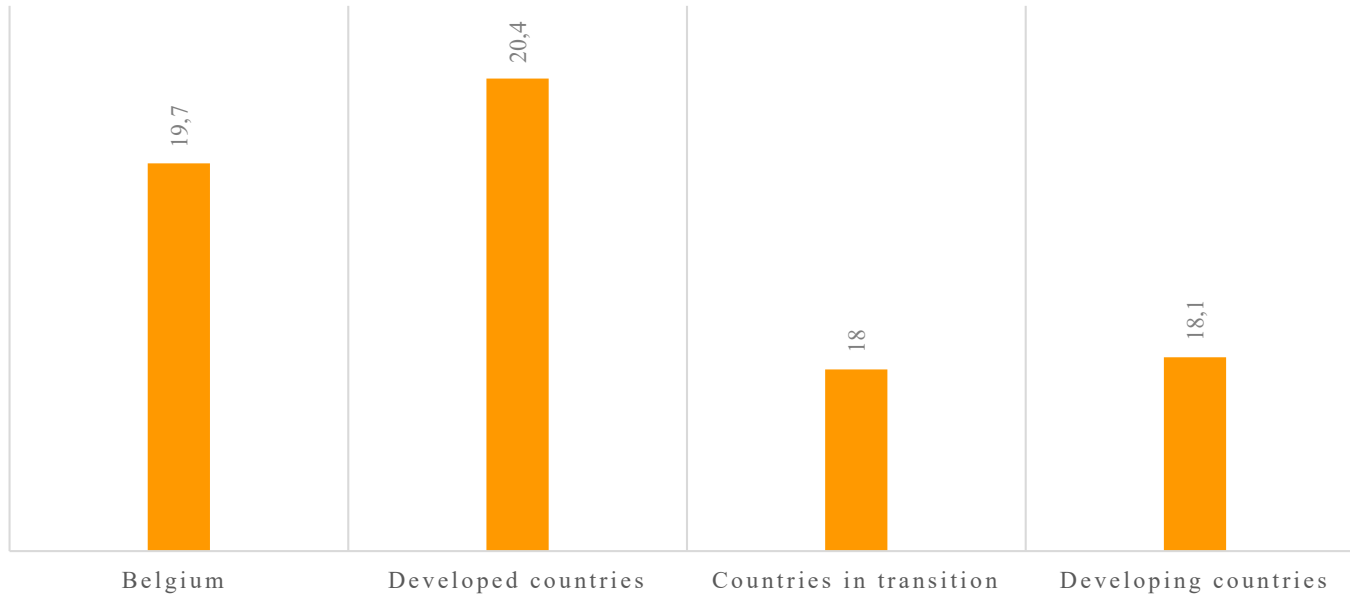
$$\begin{aligned} & \Pr(\textit{over educated}_i = 2) \\ &= \Pr(\textit{cut2} < \beta_{1i}\textit{country of birth}_i + \beta_{2i}\textit{covariates}_i + \mu_i) \end{aligned}$$

# Data and descriptive statistics

- Two Statbel databases relative to the Belgian labour market:
  - Structure of Earning Survey (SES) 1999-2010: Worker, job and firm characteristics.
  - Demobel/Belgian Population Register (NR) 1999-2010: country of birth, nationality at birth/ at time of survey.
  
- Sample selection and representativeness:
  - Pooled cross-sectional sample with 1,235,631 individuals, employed in firms with at least 10 workers, in the Belgian private sector:
    - Non-immigrants (89%) and,
    - immigrants from 167 countries (11%).

# Data and descriptive statistics

Graph 1. Incidence of over-education by region of birth



# The role of the region of birth

Table 1: Immigrants' probability to be over-educated (marginal effects from ordered probit regressions)

	Aggregated groups of immigrants (1)	Disaggregated groups of immigrants (2)
<b>Workers born in:</b>		
Belgium	Reference	Reference
<b>Developed countries</b>	<b>0.019***</b>	
North America and South Pacific		0.000
Eastern Europe (EU-13)		<b>0.039***</b>
Japan		0.019
Western Europe		<b>0.018***</b>
<b>Countries in transition</b>	<b>0.048***</b>	
Eastern Europe (non-EU)		<b>0.048***</b>
<b>Developing countries</b>	<b>0.040***</b>	
Asia		<b>0.068***</b>
Latin and Central America		<b>0.049***</b>
Maghreb		<b>0.055***</b>
Middle and Near East		<b>0.018***</b>
Sub-Saharan Africa		<b>0.021***</b>
Control variables <sup>a</sup>	YES	YES
Observations	1,235,399	1,235,399

Notes: <sup>a</sup> Regressions include covariates for gender, education, tenure, part-time, type of employment contract, region where the establishment is located, size of the establishment, ownership, level of collective agreement, year dummies. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# The role of education

Table 2: Immigrants' probability to be over-educated (marginal effects from ordered probit regressions)

	Tertiary educated workers (1)	At most lower secondary education (2)
<b>Workers born in:</b>		
<b>Belgium</b>	Reference	Reference
<b>Developed countries</b>		
North America and South Pacific <sup>a</sup>	0.003	-0.009***
Eastern Europe (EU-13)	<b>0.075***</b>	<b>0.002**</b>
Japan <sup>a</sup>	0.028	<b>0.017**</b>
Western Europe	-0.006	<b>0.003***</b>
<b>Countries in transition</b>		
Eastern Europe (non-EU)	<b>0.118***</b>	<b>0.003***</b>
<b>Developing countries</b>		
Asia <sup>a</sup>	<b>0.040**</b>	<b>0.009***</b>
Latin and Central America	<b>0.069***</b>	<b>0.005***</b>
Maghreb	<b>0.153***</b>	<b>0.003***</b>
Middle and Near East	<b>0.056***</b>	-0.001
Sub-Saharan Africa	<b>0.045***</b>	<b>0.005***</b>
Control variables <sup>b</sup>	YES	YES
Observations	335,826	395,870

Notes: <sup>a</sup>These estimates are not significantly different. <sup>b</sup>Regressions include covariates for gender, tenure, part-time, type of employment contract, region where the establishment is located, size of the establishment, ownership, level of collective agreement, year dummies. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# The role of gender

Table 3: Immigrants' probability to be over-educated (marginal effects from ordered probit regressions)

	Women (1)	Men (2)
<b>Workers born in:</b>		
<b>Belgium</b>	Reference	Reference
<b>Developed countries</b>		
North America and South Pacific <sup>a</sup>	-0.009	0.004
Eastern Europe (EU-13)	<b>0.050***</b>	<b>0.025***</b>
Japan <sup>a</sup>	0.041	0.007
Western Europe	<b>0.026***</b>	<b>0.014***</b>
<b>Countries in transition</b>		
Eastern Europe (non-EU) <sup>a</sup>	<b>0.061***</b>	<b>0.037***</b>
<b>Developing countries</b>		
Asia	<b>0.083***</b>	<b>0.059***</b>
Latin and Central America	<b>0.063***</b>	<b>0.041***</b>
Maghreb	<b>0.088***</b>	<b>0.046***</b>
Middle and Near East	<b>0.052***</b>	<b>0.007**</b>
Sub-Saharan Africa	<b>0.034***</b>	<b>0.017***</b>
Control variables <sup>b</sup>	YES	YES
Observations	396,280	839,119

Note: <sup>a</sup>These estimates are not significantly different. <sup>b</sup>Regressions include covariates for education, tenure, part-time, type of employment contract, region where the establishment is located, size of the establishment, ownership, level of collective agreement, year dummies. Standard errors in parentheses.\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# The role of tenure

Table 4: Immigrants' probability to be over-educated (marginal effects from ordered probit regressions)

	Less than 10 years of tenure (1)	More than 10 years of tenure (2)
<b>Workers born in:</b>		
<b>Belgium</b>	Reference	Reference
<b>Developed countries</b>		
North America and South Pacific <sup>a</sup>	-0.002	0.003
Eastern Europe (EU-13)	<b>0.038***</b>	<b>0.055***</b>
Japan <sup>a</sup>	0.031	-0.021
Western Europe	<b>0.020***</b>	<b>0.015***</b>
<b>Countries in transition</b>		
Eastern Europe (non-EU) <sup>a</sup>	<b>0.051***</b>	<b>0.052***</b>
<b>Developing countries</b>		
Asia	<b>0.078***</b>	<b>0.035***</b>
Latin and Central America <sup>a</sup>	<b>0.052***</b>	<b>0.040***</b>
Maghreb	<b>0.064***</b>	<b>0.036***</b>
Middle and Near East	<b>0.026***</b>	-0.000
Sub-Saharan Africa	<b>0.035***</b>	<b>-0.012**</b>
Control variables <sup>b</sup>	YES	YES
Observations	784,822	450,577

Note: <sup>a</sup>These estimates are not significantly different. <sup>b</sup>Regressions include covariates for gender, education, part-time, type of employment contract, region where the establishment is located, size of the establishment, ownership, level of collective agreement, year dummies. Standard errors in parentheses.\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# The role of citizenship acquisition

Table 5: Immigrants' probability to be over-educated (marginal effects from ordered probit regressions)

		Workers born with the Belgian nationality compared to:	
		Not naturalised immigrants (1)	Naturalised immigrants (2)
Belgian nationality at birth			
	& Born in Belgium	Reference	Reference
	& Born outside Belgium	0.055	-0.004
Non-Belgian nationality at birth			
	& Born in countries in transition:		
	Eastern Europe (non-EU)		
	<i>Naturalised</i>		<b>0.054***</b>
	<i>Not naturalised</i>	<b>0.042***</b>	
	& Born in developing country:		
	Asia		
	<i>Naturalised</i>		<b>0.052***</b>
	<i>Not naturalised</i>	<b>0.108***</b>	
	Latin and Central America		
	<i>Naturalised</i>		<b>0.049***</b>
	<i>Not naturalised</i>	<b>0.055***</b>	
	Maghreb		
	<i>Naturalised</i>		<b>0.047***</b>
	<i>Not naturalised</i>	<b>0.074***</b>	
	Middle and Near East		
	<i>Naturalised</i>		<b>0.014***</b>
	<i>Not naturalised</i>	<b>0.030***</b>	
	Sub-Saharan Africa		
	<i>Naturalised</i>		<b>0.056***</b>
	<i>Not naturalised</i>	<b>0.046***</b>	
	& Born in Belgium		
	<i>Naturalised</i>		<b>0.004***</b>
	<i>Not naturalised</i>	<b>0.005**</b>	
Control variables <sup>a</sup>		YES	YES
Observations		1,110,408	1,136,722

<sup>a</sup>Regressions include covariates for gender, education, tenure, part-time, type of employment contract, region where the establishment is located, size of the establishment, ownership, level of collective agreement, year dummies. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



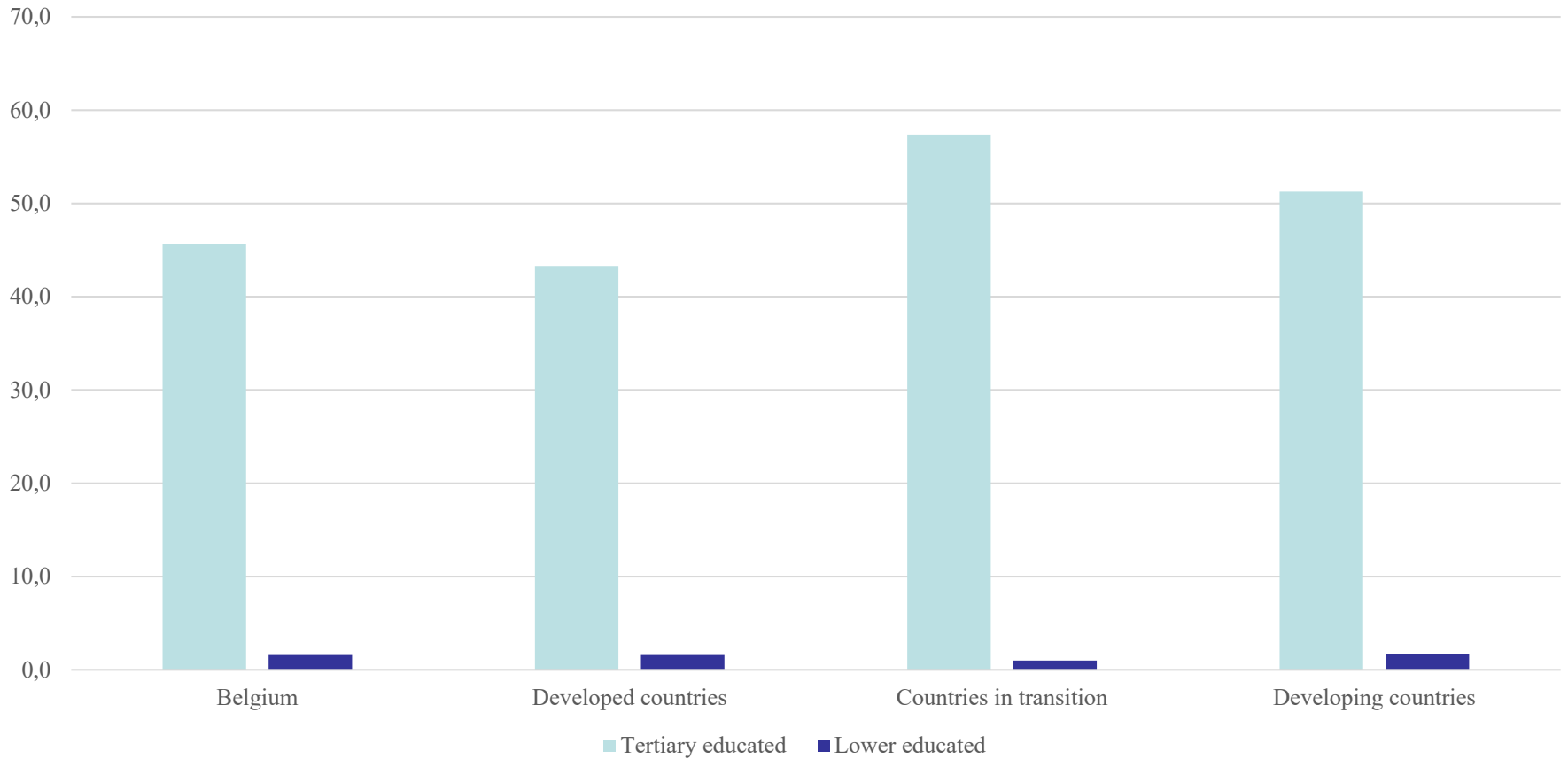
# Conclusion

- Measure of over-education in a more precise way than existing studies.
- Classifies immigrants into quite numerous disaggregated areas in order to capture the heterogeneity:
  - Immigrants born in developing and transition countries are more likely to be over-educated, especially when they are born in **the Maghreb, Asia, and Latin and Central America.**
- Examines whether over-education is affected by immigrants characteristics:
  - Over-education also appears to be particularly critical among higher-educated immigrants, especially when they are born in **the Maghreb.**
  - Gender-based differences in immigrants' penalties, in contrast, are found to be quite modest overall, except when they are born in **the Maghreb** and in **the Middle and Near East.**
  - Over-education decreases with time spent in the host country:
    - Tenure: reduction of statistical/monopsonistic discrimination.
    - Citizenship acquisition: positive signal by the employer.

Thank you for your attention

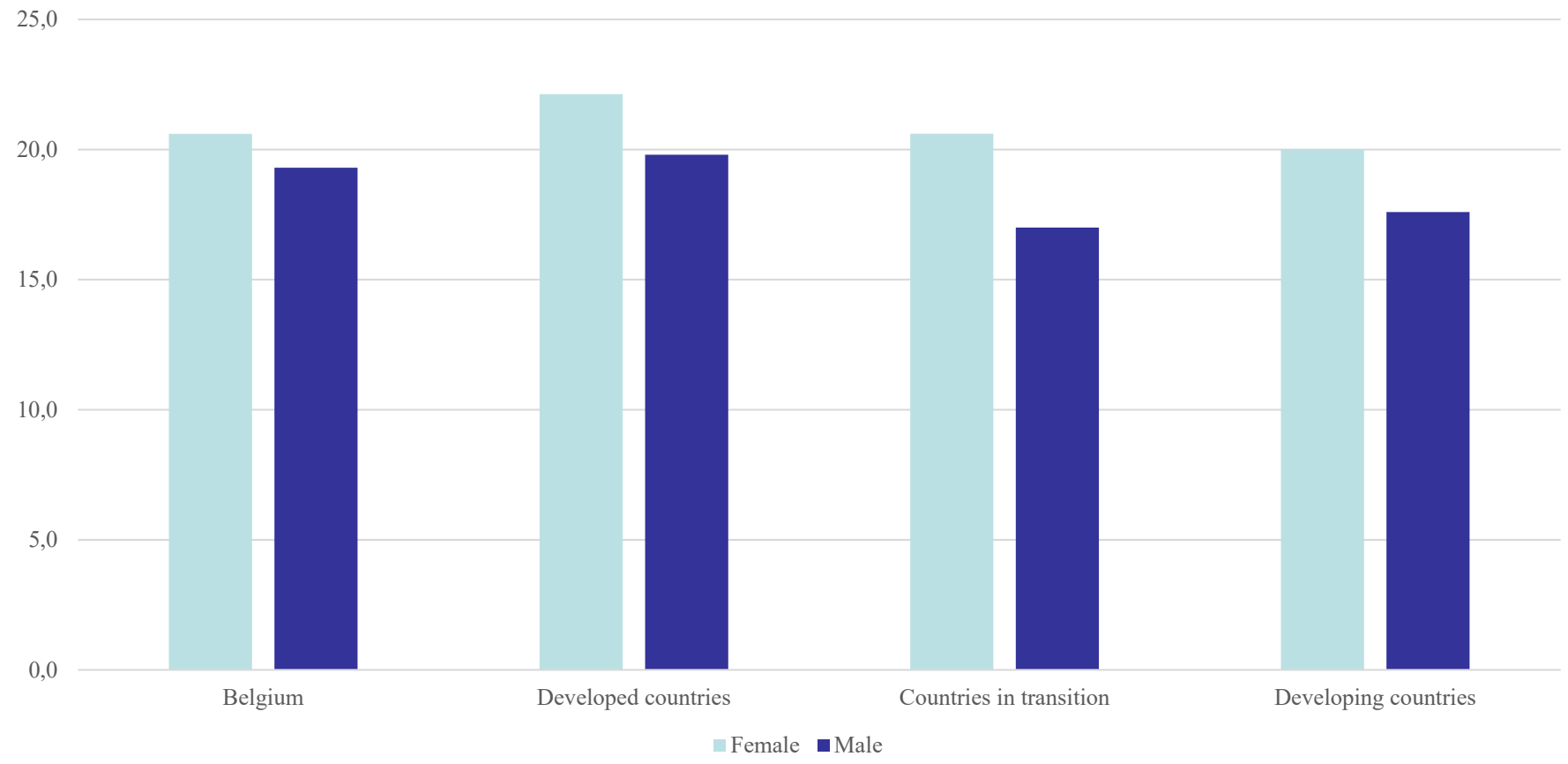
# Appendix 1

## Graph 2. Incidence of over-education by region of birth by level of education



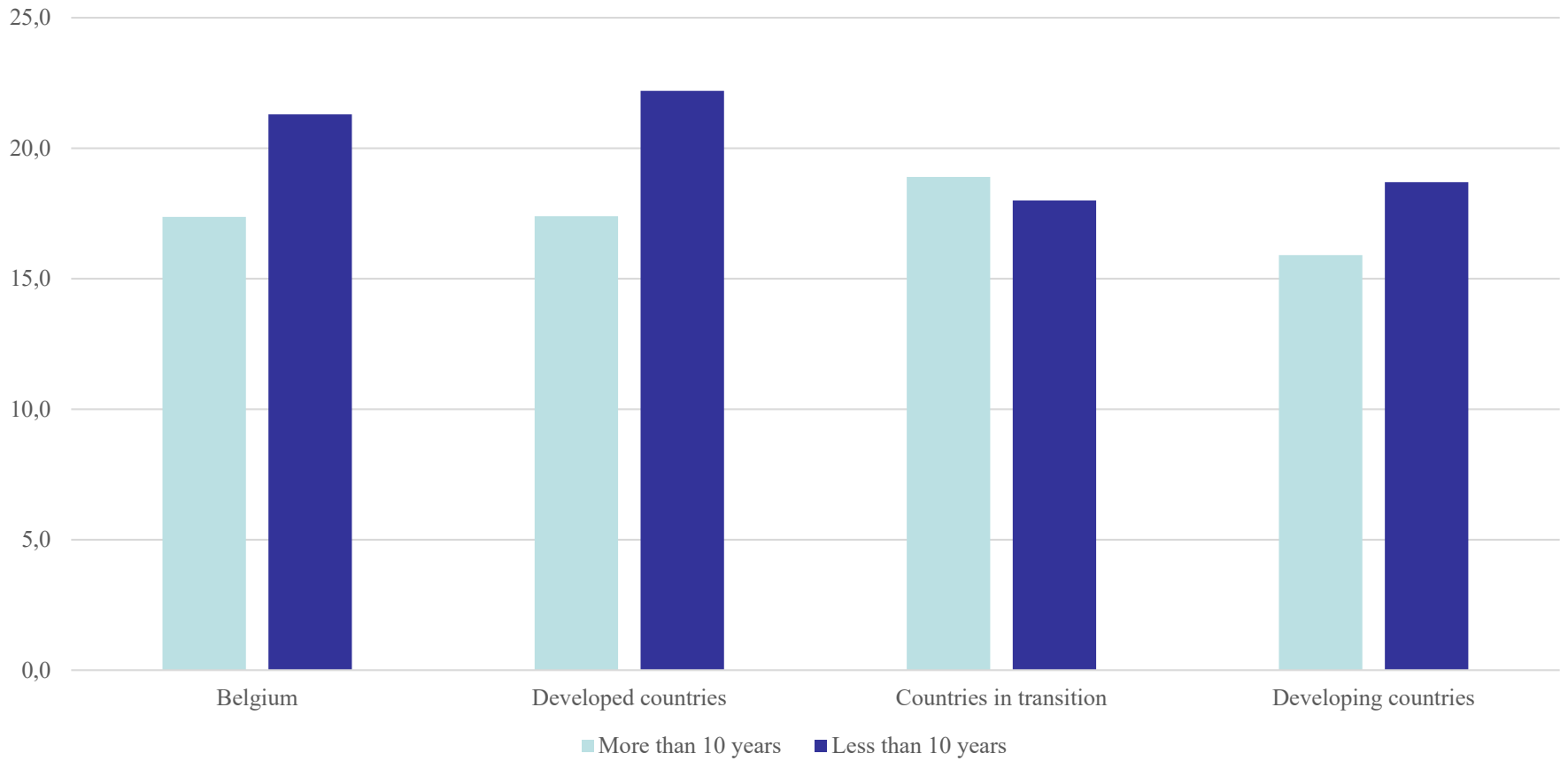
# Appendix 2

## Graph 3. Incidence of over-education by region of birth by level of gender



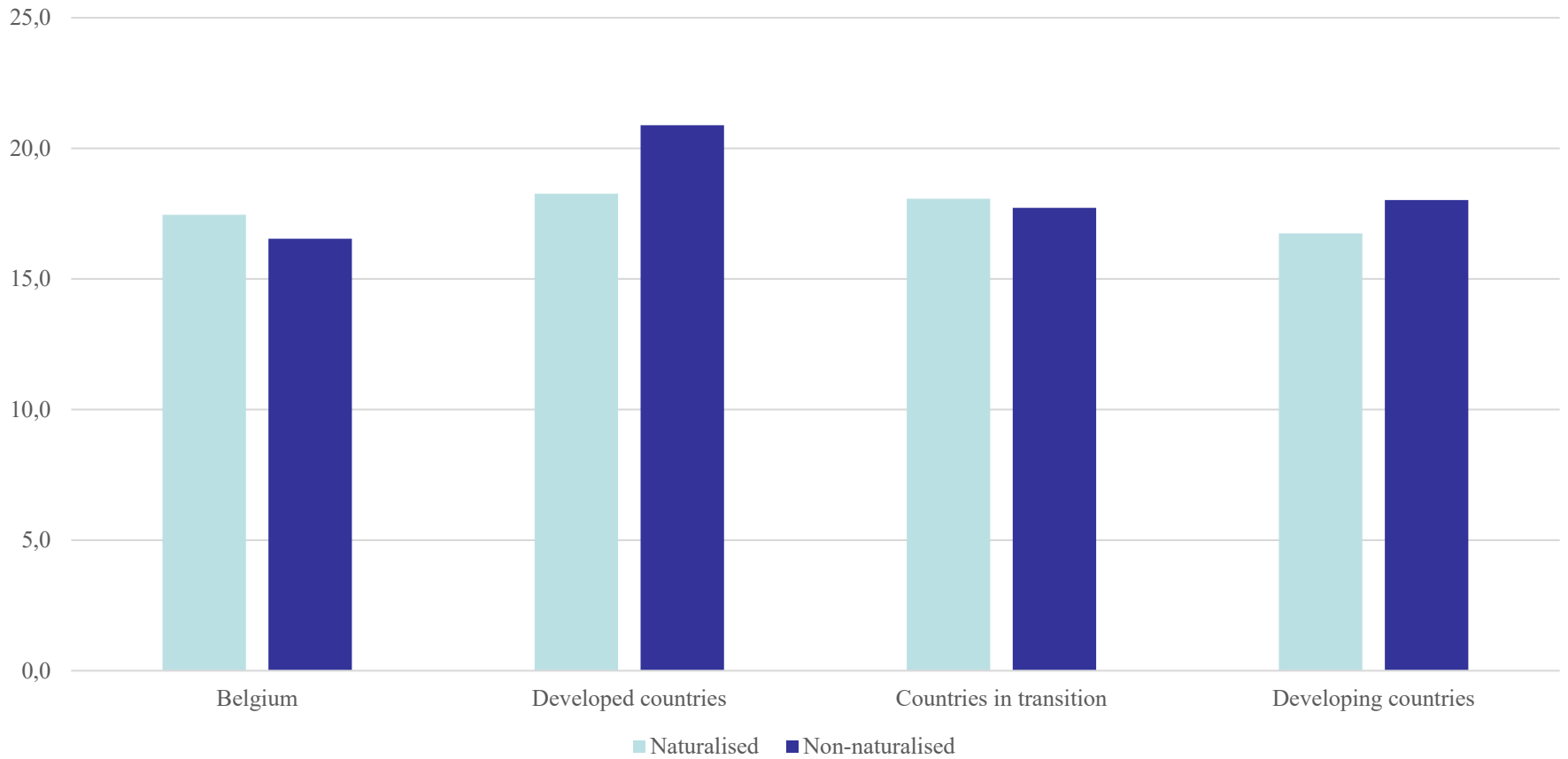
# Appendix 3

## Graph 4. Incidence of over-education by region of birth by years of tenure



# Appendix 4

## Graph 5. Incidence of over-education by region of birth by status of naturalisation



# Appendix 5. Data and descriptive statistics

## Detailed weighted descriptive statistics (1999-2010)

	Total (100%)	
	Mean	S.d.
Age (%)		
Young (15-29)	23.0	42.1
Prime (30-49)	59.2	49.1
Old (50+)	17.7	38.2
Male	67.9	46.7
Education (%)		
<b>Lower secondary at most</b>	32.5	46.9
Primary or no education	8.6	28.0
Lower secondary education	24.0	42.7
<b>Upper secondary</b>	41.2	49.2
Upper secondary education: general	23.2	42.2
Upper secondary education: technique	18.0	38.5
<b>Tertiary education</b>	26.2	44.0
Post-secondary education	15.2	35.9
Tertiary education - first level	10.4	30.5
Tertiary education - second level	0.7	8.1
Years of tenure (%)		
Less than 10 years	62.8	48.3
More than 10 years	37.2	48.3
Full-time (%)	59.8	49.0
Type of contract (%)		
Indefinite/ permanent	93.5	24.6
Fixed term/ temporary	4.5	20.7
Apprenticeship	0.2	4.8
Interim	1.8	13.2

	Total (100%)	
	Mean	S.d.
Occupation- ISCO1 (%)		
Managers	3.7	18.9
Professionals	11.2	31.5
Technicians and associate professionals	9.0	28.6
Administrative employee	21.6	41.2
Service occupation	10.4	30.6
Craft and related trades workers	18.6	38.9
Machine operators	15.8	36.5
Elementary occupations	9.8	29.7
Region of the establishment (%)		
Brussels	17.3	37.8
Wallonia	21.2	40.9
Flanders	61.5	48.7
Size of the company (FTE) (%)		
Small (1-49)	35.8	47.9
Medium (50-249)	30.4	46.0
Large (250+)	33.5	47.2
Form of economic and financial control of establishment (%)		
State own more than 50% of the capital	6.0	23.8
Firm own more than 50% of the capital	94.0	23.8

	Total (100%)	
	Mean	S.d.
Sector- NACE1 (%)		
Mining and quarrying ( C )	0.2	4.3
Manufacturing (D)	33.3	47.1
Electricity, gas and water supply ( E )	1.2	10.8
Construction (F)	7.9	26.9
Wholesale and retail trade (G)	19.0	39.2
Hotels and restaurants (H)	3.5	18.4
Transport, storage and communication (I)	12.0	32.5
Financial intermediation (J)	7.0	25.6
Real estate, renting and business activities (K)	16.0	36.6
Firm agreement (%)		
With firm agreement	26.4	44.1
Without firm agreement	73.6	44.1

# Appendix 6. Data and descriptive statistics

## Detailed descriptive statistics of regions

UN classification	Sub regions	Number of observations	Main countries
<b>Developed countries</b>		<b>71,208</b>	
	Western Europe	64,341	France (28%), Italy (23%), Germany (13%)
	Eastern Europe (EU-13)	5,010	Poland (49%), Romania (27%), Bulgaria (9%)
	North America and South Pacific	1,571	USA (53%), Canada (33%), Australia (10%)
	Japan	286	
<b>Countries in transition</b>		<b>6,105</b>	
	Eastern Europe (non-EU)	6,105	Serbia (60%), Russia (34%), Albania (6%)
<b>Developing countries</b>		<b>60,886</b>	
	Maghreb	24,168	Morocco (82%), Algeria (10%), Tunisia (6%)
	Middle and Near East	12,061	Turkey (86%), Iran (5%), Syria (2%)
	Sub-Saharan Africa	15,199	Congo (59%), Rwanda (5%), Ghana (5%)
	Latin and Central America	3,087	Brazil (17%), Chile (15%), Peru (9%)
	Asia	6,371	Vietnam (19%), India (16%), Philippine (13%)



# Appendix 7. The Belgian Nationality Code

The Belgian Nationality Code, created in 1984, has been subject to several reforms.

- Before 2000:
  - a) to be between 18 and 30 years of age,
  - b) to have been born in Belgium,
  - c) to have their main residence there.
- Since 1991, the Code enables children born in Belgium from parents who were themselves born there to obtain the Belgian nationality.
- The 2000 reform, known as the ‘Snel Belg wet’, greatly eased the criteria for acquiring the Belgian nationality:
  - a) The maximum age limit (30) was abolished,
  - b) being born in Belgium and having the main residence there since birth,
  - c) being born abroad and having one parent with the Belgian nationality at the time of the declaration,
  - d) having been a resident in Belgium for 7 years and having an unlimited right of residence.
- In 2013, the Code was amended again, but this time the criteria for acquiring the nationality were tightened up (Conseil supérieur de l’emploi, 2018).