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Labour market institutions and the challenge of allocating the right people to the right jobs: Evidence on the relation between labour market institutions and optimal skill matching from 28 industrial countries

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## Appendix A - Supplemental online material

Description A0 – Measuring skill-based job-worker (mis-)matches: Conceptual approaches

In the literature, there is an ongoing debate on how to capture the phenomenon of skill mismatch and what constitutes an adequate indicator. Irrespective of the concrete operationalisation, every concept of skill mismatch requires measures of both skills possessed (available e.g. in PIAAC) and skills required at the workplace. As the PIAAC survey only provides information on the skills possessed by workers, a direct and objective measure of skill matching based on a systematic evaluation of job requirements does not exist.

By now, three different approaches have been developed to proxy skill requirements: (1) The direct self-assessment (DSA), for which workers are asked directly about the required level of skills. Although this approach is easy to implement in survey, it bears several problems, the most pressing one being the lack of an objective anchor (see Allen and van der Velden, 2005) and the risk of social bias (“talking up one’s own job”). Approach (2) is the job requirement approach, capturing (mis-)matches between the skills that workers possess and the (frequency of) skill use at the job (see Green et al., 2013). One theoretical problem here is that skill use is not necessarily a good proxy for skill requirements, and that skill proficiency and skill use are closely interlinked and can therefore not be treated as two different forces. The third approach (3) is the so-called Realised Matches Approach (RMA), which is a commonly used statistical skill mismatch measure that captures the deviation of the individual skill

proficiency from the mean proficiency in each occupation in each country (van der Velden and Bijlsma 2018; Flisi et al. 2016; Perry, Wiederhold, and Ackermann-Piek 2014). The main theoretical problem that arises with this approach is the forced equilibrium where, by definition, the ‘average’ worker is defined as well-matched.

For the purpose of this paper, the drawback of the RMA is not a problem. Note that we take an optimal matching approach. That means that we assume that the best skilled worker is allocated to the job that requires the highest skills level, the next best skilled worker is allocated to the job with the next highest skill requirements etc. This is perfectly in line with the RMA assumption that the average skilled worker is well-matched if he/she is employed in a job with average skill requirements. In other words as we look at relative matching rather than absolute matching, the RMA approach is perfectly suitable for our analyses.

Table A1. Descriptive statistics: Country level

Country	Country sample size (Freq.)	Working sample (Freq. male fulltime)	Wellmatched male fulltime workers (%)	Scores on country-level variables				
				EPL (permanent contracts) <sup>A</sup>	Average net replacement rate <sup>B</sup>	Expenditure on ALMP (2011) <sup>C</sup>	Enforcement (Knotz 2012) <sup>D</sup>	Enablement (Knotz 2012) <sup>D</sup>
Austria	2.309	1,407	80.86	2.44	75	0.75	0.71	0.47
Belgium	2.151	1,320	79.22	3.13	57.1	1.59	0.48	0.41
Canada	2.532	1,315	72.08	1.51	64.9	0.26	0.78	0.28
Chile*	2.001	1,086	73.51	1.8	20.4	0.1	.	.
Czech Republic	2.507	1,290	83.96	2.75	57.6	0.27	.	.
Denmark	4.582	2,493	78.68	2.32	75.8	2.26	0.52	0.57
Estonia	4.115	1,857	82.72	2.07	45.5	0.23	.	.
Finland	2.765	1,418	80.25	2.17	73.3	1.02	0.55	0.46
France	3.159	1,777	74.49	2.82	60	0.93	0.58	0.55
Germany	2.349	1,467	78.46	2.84	63.8	0.79	0.62	0.42
Greece*	1.127	617	77.82	2.41	16	.	.	.
Ireland	2.017	1,104	77.34	1.98	82.5	.	0.69	0.36
Israel*	2.201	1,268	67.01	2.22	53.2	0.18	.	.
Italy	1.642	988	74.54	3.03	9	0.41	0.61	0.37
Japan	2.635	1,616	82.31	2.09	81	0.27	0.68	0.28
Korea	2.661	1,536	81.59	2.17	42.5	0.33	.	.
Lithuania*	2.532	1,046	79.82	2.42	60.4	.	.	.
Netherlands	1.952	1,381	79.46	2.88	76.4	1.11	0.71	0.4
New Zealand*	2.533	1,346	72.84	1.01	57.8	.	0.7	0.23
Norway	2.318	1,346	78.26	2.31	72	0.27	0.66	0.63
Poland	3.517	2,107	77.79	2.39	52.5	0.42	.	.
Slovakia	2.468	1,283	84.85	2.67	43.3	0.3	.	.
Slovenia*	2,460	1,270	75.69	2.36	64.6	0.36	.	.
Spain	2.186	1,267	78.64	2.56	46.5	0.88	0.61	0.34
Sweden	2,400	1,299	78.13	2.52	62.6	1.09	0.58	0.65
Turkey*	1.487	1,133	73.97	2.33	8.8	.	.	.
UK	3.386	1,799	76.02	1.76	72.7	0.23	0.68	0.36
US	2,378	1,205	71.91	1.17	42.2	0.14	0.83	0.2
<b>Total</b>	<b>70,370</b>	<b>39,041</b>	<b>77.84</b>					

Sources: <sup>A</sup> OECD 2018; <sup>B</sup> OECD 2013; <sup>C</sup> OECD 2013a; <sup>D</sup> Knotz 2012; \* PIAAC conducted in 2014/15.

Note: We have to exclude PIAAC-countries Singapore and Cyprus as no macro-data is available.

Table A2. Descriptive statistics of micro-level variables | Working sample (main analyses): Male fulltime working employees

	Min	Max	Mean (SD)	missings	True=1	Reference
<b>Age</b>	15	65	40.32 (11.86)	1		
<b>Migration background (1<sup>st</sup> and 2<sup>nd</sup> generation)</b>	0	1		191 (0.49%)	4,619 (11.83 %)	No migration background
<b>Highest level of formal education:</b>				14 (0.04%)		Compulsory education
<i>Compulsory</i>	0	1			6,128 (15.70%)	
<i>Secondary or apprenticeship</i>	0	1			22,975 (58.85%)	
<i>Tertiary</i>	0	1			9,924 (25.42%)	
<b>ISCO 1-digit</b>	1	9		0		
<b>ISIC 1-digit</b>	1	21		299		

Table A3. Descriptive Statistics: Mismatch over micro level groups

	Male fulltime workers	Public sector <sup>1</sup>	Private sector <sup>1</sup>	Young (16-34 y/o) <sup>2</sup>	Prime age (35-54 y/o) <sup>2</sup>	Older (55-65 y/o) <sup>2</sup>	Female fulltime workers
Underskilled	4,092 (10.48%)	773 (9.86%)	3,307 (10.62%)	1,180 (8.46%)	1,988 (10.28%)	924 (16.06%)	3,931 (12.55%)
<b>Wellskilled</b>	<b>29,818</b> <b>(76.3%)</b>	<b>5,888</b> <b>(75.07%)</b>	<b>23,897</b> <b>(76.71%)</b>	<b>10,670</b> <b>(76.48%)</b>	<b>14,720</b> <b>(76.14%)</b>	<b>4,428</b> <b>(76.94%)</b>	<b>24,955</b> <b>(79.65%)</b>
Overskilled	5,131 (13.14%)	1,182 (15.07%)	3,947 (12.67%)	2,101 (15.06%)	2,626 (13.58%)	403 (7.00%)	2,443 (7.80%)
<b>Total</b>	<b>39,041</b>	<b>7,843</b>	<b>31,151</b>	<b>13,951</b>	<b>19,334</b>	<b>5,755</b>	<b>31,329</b>

Notes: <sup>1</sup> For 47 male fulltime workers the information on the sector is missing; <sup>2</sup> For 1 respondent the age is unknown

Table A4: Alternative Operationalisation (H3): Expenditure for Activating Labour Market Policies per capita

VARIABLES	Model 1	Model 1a
<i>Fixed effects</i>		
Exp. ALMP per capita	0.001 (0.001)	0.001 (0.001)
Age		-0.001 (0.002)
Age2		0.000 (0.000)
Mig. Background		-0.054*** (0.013)
Sec. Ed./Appren.		0.072*** (0.015)
Tertiary Edu.		0.001 (0.018)
<i>Random effects variance</i>		
Country	0.064 (0.019)	0.054 (0.016)
Observations	33,683	33,496
No. of cntries.	24	24
<b>GOODNESS OF FIT of the models</b>		
Likelihood ratio test	Model 1	Model 1a
log likelihood	-18917	-18663
Deviance <sup>1</sup> (D <sub>i</sub> )	37834	37326
Decrease (D <sub>0</sub> -D <sub>i</sub> ) <sup>2</sup>	120	398
Degrees of freedom	(df = 3)	(df = 6)
Chi-squared value	p<0.005 ***	p<0.005 ***

**AVERAGE MARGINAL EFFECTS (AMEs)** based on multilevel mixed-effects logistic regression models; All figures are weighted; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
*All models control for occupational structure (ISCO 1-dig) and sectoral structure (ISIC).*

Table A5: Robustness check with n-1 countries; Hypothesis 1: Employment Protection Legislation (EPL)

<i>without country ...</i>	<i>Austria</i>	<i>Belgium</i>	<i>Canada</i>	<i>Chile</i>	<i>Czech Rep.</i>	<i>Denmark</i>	<i>Estonia</i>	<i>Finland</i>	<i>France</i>	<i>Germany</i>	<i>Greece</i>	<i>Ireland</i>	<i>Israel</i>	<i>Italy</i>
<b>VARIABLES</b>	<b>no_40</b>	<b>no_56</b>	<b>no_124</b>	<b>no_152</b>	<b>no_203</b>	<b>no_208</b>	<b>no_233</b>	<b>no_246</b>	<b>no_250</b>	<b>no_276</b>	<b>no_300</b>	<b>no_372</b>	<b>no_376</b>	<b>no_380</b>
EPL	0.269*** (0.076)	0.296*** (0.084)	0.242*** (0.079)	0.257*** (0.078)	0.236*** (0.067)	0.271*** (0.076)	0.288*** (0.071)	0.274*** (0.075)	0.275*** (0.077)	0.278*** (0.081)	0.270*** (0.076)	0.276*** (0.075)	0.266*** (0.079)	0.312*** (0.073)
<i>Micro-controls</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>
Observations	36,792	36,868	36,889	37,096	36,895	36,242	36,337	36,763	36,408	36,716	37,574	37,077	36,940	37,197
Number of countries	27	27	27	27	27	27	27	27	27	27	27	27	27	27
log likelihood	-21039	-21065	-20969	-20994	-21178	-20711	-20872	-21034	-20734	-20960	-21430	-21145	-21016	-21172

LOGODDS; Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; ALL MODELS ARE WEIGHTED; Controls include isco 1-dig and isic 1-dig

*Continued:*

<i>without country ...</i>	<i>Japan</i>	<i>Korea</i>	<i>Lithuania</i>	<i>NL</i>	<i>NZ</i>	<i>Norway</i>	<i>Poland</i>	<i>Slovak Rep.</i>	<i>Slovenia</i>	<i>Spain</i>	<i>Sweden</i>	<i>Turkey</i>	<i>UK</i>	<i>USA</i>
<b>VARIABLES</b>	<b>no_392</b>	<b>no_410</b>	<b>no_440</b>	<b>no_528</b>	<b>no_554</b>	<b>no_578</b>	<b>no_616</b>	<b>no_703</b>	<b>no_705</b>	<b>no_724</b>	<b>no_752</b>	<b>no_792</b>	<b>no_826</b>	<b>no_840</b>
EPL	0.281*** (0.073)	0.277*** (0.074)	0.267*** (0.075)	0.269*** (0.081)	0.276*** (0.099)	0.271*** (0.076)	0.270*** (0.076)	0.255*** (0.074)	0.290*** (0.078)	0.271*** (0.077)	0.275*** (0.077)	0.271*** (0.076)	0.258*** (0.078)	0.238*** (0.087)
<i>Micro-controls</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>
Observations	36,567	36,645	37,135	36,800	36,835	36,918	36,075	36,900	36,914	36,926	36,885	37,062	36,455	36,976
Number of countries	27	27	27	27	27	27	27	27	27	27	27	27	27	27
log likelihood	-20914	-20969	-21139	-21043	-20846	-21074	-20740	-21169	-21000	-21097	-21070	-21146	-20540	-20951

LOGODDS; Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; ALL MODELS ARE WEIGHTED; Controls include isco 1-dig and isic 1-dig

*We repeated this robustness check additionally including age, age squared, migration background and dummies for secondary education/apprenticeship and tertiary education. While the effect sizes are slightly smaller the robustness check is still valid (full results are available upon request).*

Table A6: Robustness check with n-1 countries; Hypothesis 4a: Enforcement

<i>without country ...</i> <b>VARIABLES</b>	<i>Austria</i> <b>no_40</b>	<i>Belgium</i> <b>no_56</b>	<i>Canada</i> <b>no_124</b>	<i>Denmark</i> <b>no_208</b>	<i>Finland</i> <b>no_246</b>	<i>France</i> <b>no_250</b>	<i>Germany</i> <b>no_276</b>	<i>Ireland</i> <b>no_372</b>	<i>Italy</i> <b>no_380</b>
Enforcement	-1.351*** (0.411)	-1.449*** (0.460)	<b>-0.985*</b> (0.508)	-1.329*** (0.470)	-1.244*** (0.441)	-1.267*** (0.428)	-1.234*** (0.421)	-1.303*** (0.424)	-1.296*** (0.437)
<i>Micro-controls</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>
Observations	22,374	22,450	22,471	21,824	22,345	21,990	22,298	22,659	22,779
Number of countries	16	16	16	16	16	16	16	16	16
log likelihood	-13118	-13145	-13045	-12791	-13114	-12814	-13041	-13223	-13249

LOGODDS; Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; ALL MODELS ARE WEIGHTED; Controls include isco 1-dig and isic 1-dig

*Continued:*

<i>without country ...</i> <b>VARIABLES</b>	<i>Japan</i> <b>no_392</b>	<i>NL</i> <b>no_528</b>	<i>NZ</i> <b>no_554</b>	<i>Norway</i> <b>no_578</b>	<i>Spain</i> <b>no_724</b>	<i>Sweden</i> <b>no_752</b>	<i>UK</i> <b>no_826</b>	<i>USA</i> <b>no_840</b>
Enforcement	-1.353*** (0.381)	-1.407*** (0.375)	<b>-1.164**</b> (0.480)	-1.262*** (0.429)	-1.231*** (0.420)	-1.288*** (0.433)	-1.197*** (0.455)	<b>-0.909</b> (0.563)
<i>Micro-controls</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>
Observations	22,149	22,382	22,417	22,500	22,508	22,467	22,037	22,558
Number of countries	16	16	16	16	16	16	16	16
log likelihood	-12994	-13121	-12923	-13154	-13178	-13150	-12617	-13033

LOGODDS; Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; ALL MODELS ARE WEIGHTED; Controls include isco 1-dig and isic 1-dig

*We repeated this robustness check additionally including age, age squared, migration background and dummies for secondary education/apprenticeship and tertiary education. While the effect sizes are slightly smaller the robustness check is still valid (full results are available upon request).*



Table A7: Robustness check: Rerunning the main analyses (EPL and Enforcement), using a random slope at the country level

VARIABLES	Model 1 <i>EPL</i>	Model 1a <i>EPL</i>	Model 2 <i>Enforcement</i>	Model 2a <i>Enforcement</i>
<i>Fixed effects</i>				
<b>H1: EPL</b>	0.253*** (0.048)	0.218*** (0.055)		
<b>H4a: Enforcement</b>			-1.255*** (0.429)	-1.024** (0.501)
age2		-0.017 (0.011)		-0.023* (0.013)
age2		0.000 (0.000)		0.000* (0.000)
Mig.back		-0.321*** (0.072)		-0.358*** (0.079)
Sec edu.		0.382*** (0.063)		0.343*** (0.078)
Tert. Edu		0.053 (0.071)		-0.034 (0.097)
<i>Random effects variance</i>				
EPL	0.009 (0.002)	0.008 (0.002)		
Enforcement			2.87e-38 (4.57e-37)	4.46e-31 (1.25e-30)
Observations	38181	37,978	23,763	23,658
Number of groups	28	28	17	17
log likelihood	-48967	-50342	-13859	-13690

Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; ALL MODELS ARE WEIGHTED; Controls include isco 1-dig and isic 1-dig  
*Table displays log odds, obtained using random slope at the country level*

Table A8a. Robustness Check: Male fulltime working YOUNG workers (age<35) only

VARIABLES	Model 1	Model 1a	Model 2	Model 2a	Model 3	Model 3a	Model 4	Model 4a	Model 5	Model 5a	Model 6	Model 6a	Model 7	Model 7a
<i>Fixed effects</i>														
H1: EPL	0.043*** (0.017)	0.036** (0.018)					0.044*** (0.017)	0.035* (0.018)					0.044** (0.019)	0.036* (0.019)
H2: Unemp. Prot.			0.000 (0.000)	0.000 (0.000)										
H3: Exp. ALMP					0.014 (0.016)	0.011 (0.015)								
H4a: Enforce.									-0.192 (0.122)	-0.148 (0.137)			0.002 (0.110)	0.011 (0.124)
H4b: Enablement											0.079 (0.093)	0.058 (0.089)		
Mig. Background		-0.054*** (0.018)		-0.055*** (0.018)		-0.062*** (0.022)		-0.070*** (0.022)		-0.070*** (0.022)		-0.071*** (0.022)		-0.070*** (0.022)
Sec. Ed./Appren.		0.019 (0.016)		0.018 (0.016)		0.034** (0.015)		0.023 (0.014)		0.022 (0.014)		0.022 (0.014)		0.023 (0.014)
Tertiary Edu.		-0.095*** (0.024)		-0.097*** (0.024)		-0.084*** (0.028)		-0.096*** (0.022)		-0.098*** (0.022)		-0.098*** (0.021)		-0.096*** (0.022)
<i>Random effect variances</i>														
Country	0.054 (0.017)	0.054 (0.017)	0.072 (0.021)	0.067 (0.022)	0.081 (0.023)	0.077 (0.023)	0.040 (0.025)	0.048 (0.024)	0.057 (0.024)	0.059 (0.025)	0.064 (0.029)	0.063 (0.029)	0.040 (0.025)	0.047 (0.024)
Observations	13,306	13,230	13,306	13,230	11,343	11,273	7,187	7,158	7,187	7,158	7,187	7,158	7,187	7,158
No. of cntries.	28	28	28	28	23	23	17	17	17	17	17	17	17	17
<b>GOODNESS OF FIT of the models</b>														
<b>Likelihood ratio test</b>	<b>Model 1</b>	<b>Model 1a</b>	<b>Model 2</b>	<b>Model 2a</b>	<b>Model 3</b>	<b>Model 3a</b>	<b>Model 4</b>	<b>Model 4a</b>	<b>Model 5</b>	<b>Model 5a</b>	<b>Model 6</b>	<b>Model 6a</b>	<b>Model 7</b>	<b>Model 7a</b>
log likelihood	-7374	-7260	-7377	-7262	-6179	-6074	-4358	-4291	-4360	-4292	-4361	-4292	-4358	-4291
Deviance <sup>1</sup> (D <sub>i</sub> )	14748	14520	14754	14524	12358	12148	8716	8582	8720	8584	8722	8584	8716	8582
Decrease (D <sub>0</sub> -D <sub>i</sub> ) <sup>2</sup>	80	=D <sub>29</sub> - E <sub>29</sub>	74	214	76	204	80	184	76	182	74	182	80	184
Degrees of freedom	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 4)	(df = 7)
Chi-squared value	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***

**AVERAGE MARGINAL EFFECTS (AMEs)** based on multilevel mixed-effects logistic regression models; All figures are weighted; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
*All models control for occupational structure (ISCO 1-dig) and sectoral structure (ISIC).*

Table A8b. Robustness Check: Male fulltime working ADULT workers (age $\geq$ 35) only

VARIABLES	Model 1	Model 1a	Model 2	Model 2a	Model 3	Model 3a	Model 4	Model 4a	Model 5	Model 5a	Model 6	Model 6a	Model 7	Model 7a
<i>Fixed effects</i>														
H1: EPL	0.048*** (0.013)	0.042*** (0.012)					0.040*** (0.008)	0.035*** (0.008)					0.032*** (0.011)	0.032*** (0.009)
H2: Unemp. Prot.			0.000 (0.000)	0.000 (0.000)										
H3: Exp. ALMP					0.015 (0.016)	0.011 (0.014)								
H4a: Enforce.									-0.222*** (0.065)	-0.175** (0.072)			-0.084 (0.081)	-0.038 (0.075)
H4b: Enablement											0.140** (0.065)	0.108* (0.059)		
Mig. Background		-0.052*** (0.013)		-0.053*** (0.013)		-0.065*** (0.013)		-0.071*** (0.017)		-0.070*** (0.017)		-0.071*** (0.017)		-0.070*** (0.017)
Sec. Ed./Appren.		0.078*** (0.015)		0.078*** (0.016)		0.076*** (0.017)		0.071*** (0.017)		0.070*** (0.018)		0.069*** (0.018)		0.071*** (0.017)
Tertiary Edu.		0.031* (0.018)		0.030 (0.018)		0.026 (0.020)		0.022 (0.022)		0.020 (0.022)		0.020 (0.023)		0.022 (0.022)
<i>Random effect variances</i>														
Country	0.054 (0.178)	0.04 (0.016)	0.072 (0.024)	0.055 (0.02)	0.08 (0.03)	0.062 (0.024)	0.011 (0.006)	0.006 (0.003)	0.017 (0.006)	0.012 (0.005)	0.019 (0.007)	0.014 (0.005)	0.01 (0.005)	0.005 (0.003)
Observations	24,874	24,747	24,874	24,747	21,615	21,497	16,576	16,500	16,576	16,500	16,576	16,500	16,576	16,500
No. of cntries.	28	28	28	28	23	23	17	17	17	17	17	17	17	17
<b>GOODNESS OF FIT of the models</b>														
<b>Likelihood ratio test</b>	<b>Model 1</b>	<b>Model 1a</b>	<b>Model 2</b>	<b>Model 2a</b>	<b>Model 3</b>	<b>Model 3a</b>	<b>Model 4</b>	<b>Model 4a</b>	<b>Model 5</b>	<b>Model 5a</b>	<b>Model 6</b>	<b>Model 6a</b>	<b>Model 7</b>	<b>Model 7a</b>
log likelihood	-14282	-14112	-14285	-14115	-12307	-12146	-9434	-9318	-9437	-9321	-9437	-9322	-9434	-9318
Deviance <sup>1</sup> (D <sub>i</sub> )	28564	28224	28570	28230	24614	24292	18868	18636	18874	18642	18874	18644	18868	18636
Decrease (D <sub>0</sub> -D <sub>i</sub> ) <sup>2</sup>	90	268	84	262	76	250	60	200	54	194	54	192	60	200
Degrees of freedom	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 4)	(df = 7)
Chi-squared value	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***

**AVERAGE MARGINAL EFFECTS (AMEs)** based on multilevel mixed-effects logistic regression models; All figures are weighted; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
*All models control for occupational structure (ISCO 1-dig) and sectoral structure (ISIC).*

Table A9. NON-IMMIGRANT male fulltime workers only

VARIABLES	Model 1	Model 1a	Model 2	Model 2a	Model 3	Model 3a	Model 4	Model 4a	Model 5	Model 5a	Model 6	Model 6a	Model 7	Model 7a
<i>Fixed effects</i>														
H1: EPL	0.046*** (0.012)	0.046*** (0.012)					0.043*** (0.010)	0.043*** (0.011)					0.039*** (0.014)	0.041*** (0.014)
H2: Unemp. Prot.			0.000 (0.000)	0.000 (0.000)										
H3: Exp. ALMP					0.023* (0.014)	0.019 (0.014)								
H4a: Enforce.									-0.215*** (0.069)	-0.200*** (0.076)			-0.042 (0.079)	-0.019 (0.079)
H4b: Enablement											0.155** (0.062)	0.136** (0.066)		
Age		-0.004* (0.002)		-0.004 (0.002)		-0.003 (0.002)		-0.005 (0.003)		-0.004 (0.003)		-0.004 (0.003)		-0.005 (0.003)
Age2		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)
Sec. Ed./Appren.		0.040*** (0.012)		0.040*** (0.012)		0.045*** (0.014)		0.029** (0.012)		0.028** (0.012)		0.028** (0.013)		0.029** (0.012)
Tertiary Edu.		-0.042*** (0.015)		-0.043*** (0.015)		-0.039** (0.018)		-0.059*** (0.017)		-0.061*** (0.016)		-0.061*** (0.017)		-0.059*** (0.017)
<i>Random effect variances</i>														
Country	0.043 (0.013)	0.044 (0.013)	0.06 (0.016)	0.062 (0.015)	0.063 (0.018)	0.067 (0.017)	0.015 (0.008)	0.018 (0.009)	0.026 (0.009)	0.030 (0.010)	0.025 (0.008)	0.031 (0.011)	0.015 (0.008)	0.018 (0.009)
Observations	33,439	33,435	33,439	33,435	28,971	28,967	20,416	20,415	20,416	20,415	20,416	20,415	20,416	20,415
No. of cntries.	28	28	28	28	23	23	17	17	17	17	17	17	17	17
<b>GOODNESS OF FIT of the models</b>														
<b>Likelihood ratio test</b>	<b>Model 1</b>	<b>Model 1a</b>	<b>Model 2</b>	<b>Model 2a</b>	<b>Model 3</b>	<b>Model 3a</b>	<b>Model 4</b>	<b>Model 4a</b>	<b>Model 5</b>	<b>Model 5a</b>	<b>Model 6</b>	<b>Model 6a</b>	<b>Model 7</b>	<b>Model 7a</b>
log likelihood	-18269	-18177	-18273	-18181	-15624	-15539	-11298	-11238	-11301	-11241	-11301	-11241	-11298	-11238
Deviance <sup>1</sup> (D <sub>i</sub> )	36538	36354	36546	36362	31248	31078	22596	22476	22602	22482	22602	22482	22596	22476
Decrease (D <sub>0</sub> -D <sub>i</sub> ) <sup>2</sup>	130	306	122	298	106	268	92	212	86	206	86	206	92	212
Degrees of freedom	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 4)	(df = 7)
Chi-squared value	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***

**AVERAGE MARGINAL EFFECTS (AMEs)** based on multilevel mixed-effects logistic regression models; All figures are weighted; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
*All models control for occupational structure (ISCO 1-dig) and sectoral structure (ISIC).*

Table A10a. Male fulltime workers in the PRIVATE SECTOR only

VARIABLES	Model 1	Model 1a	Model 2	Model 2a	Model 3	Model 3a	Model 4	Model 4a	Model 5	Model 5a	Model 6	Model 6a	Model 7	Model 7a
<i>Fixed effects</i>														
H1: EPL	0.048*** (0.013)	0.042*** (0.012)					0.043*** (0.010)	0.039*** (0.011)					0.034*** (0.011)	0.034*** (0.011)
H2: Unemp. Prot.			0.000 (0.000)	0.000 (0.000)										
H3: Exp. ALMP					0.020 (0.015)	0.016 (0.014)								
H4a: Enforce.									-0.247*** (0.077)	-0.202** (0.086)			-0.096 (0.078)	-0.054 (0.079)
H4b: Enablement											0.144** (0.068)	0.114* (0.062)		
Age		-0.002 (0.002)		-0.002 (0.002)		-0.001 (0.002)		-0.003 (0.002)		-0.002 (0.002)		-0.002 (0.002)		-0.003 (0.002)
Age2		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)
Mig. Background		-0.055*** (0.013)		-0.055*** (0.013)		-0.064*** (0.014)		-0.075*** (0.017)		-0.075*** (0.016)		-0.076*** (0.016)		-0.075*** (0.017)
Sec. Ed./Appren.		0.059*** (0.012)		0.058*** (0.013)		0.063*** (0.015)		0.057*** (0.013)		0.056*** (0.014)		0.055*** (0.015)		0.057*** (0.013)
Tertiary Edu.		-0.012 (0.016)		-0.013 (0.017)		-0.010 (0.019)		-0.010 (0.019)		-0.012 (0.020)		-0.012 (0.020)		-0.010 (0.019)
<i>Random effect variances</i>														
Country	0.045 (0.014)	0.037 (0.012)	0.064 (0.019)	0.053 (0.017)	0.07 (0.023)	0.058 (0.019)	0.013 (0.007)	0.009 (0.005)	0.02 (0.008)	0.017 (0.007)	0.024 (0.009)	0.020 (0.008)	0.011 (0.007)	0.009 (0.005)
Observations	30,436	30,266	30,436	30,266	26,351	26,193	18,709	18,620	18,709	18,620	18,709	18,620	18,709	18,620
No. of cntries.	28	28	28	28	23	23	17	17	17	17	17	17	17	17
<b>GOODNESS OF FIT of the models</b>														
<b>Likelihood ratio test</b>	<b>Model 1</b>	<b>Model 1a</b>	<b>Model 2</b>	<b>Model 2a</b>	<b>Model 3</b>	<b>Model 3a</b>	<b>Model 4</b>	<b>Model 4a</b>	<b>Model 5</b>	<b>Model 5a</b>	<b>Model 6</b>	<b>Model 6a</b>	<b>Model 7</b>	<b>Model 7a</b>
log likelihood	-17482	-17259	-17486	-17263	-14932	-14720	-11092	-10945	-11095	-10948	-11096	-10949	-11092	-10944
Deviance <sup>1</sup> (D <sub>i</sub> )	34964	34518	34972	34526	29864	29440	22184	21890	22190	21896	22192	21898	22184	21888
Decrease (D <sub>0</sub> -D <sub>i</sub> ) <sup>2</sup>	90	324	82	316	72	304	60	250	54	244	52	242	60	252
Degrees of freedom	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 4)	(df = 7)
Chi-squared value	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***

**AVERAGE MARGINAL EFFECTS (AMEs)** based on multilevel mixed-effects logistic regression models; All figures are weighted; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
*All models control for occupational structure (ISCO 1-dig) and sectoral structure (ISIC).*

Table A10b. Male fulltime workers in the PUBLIC SECTOR only

VARIABLES	Model 1	Model 1a	Model 2	Model 2a	Model 3	Model 3a	Model 4	Model 4a	Model 5	Model 5a	Model 6	Model 6a	Model 7	Model 7a
<i>Fixed effects</i>														
H1: EPL	0.038** (0.016)	0.033** (0.016)					0.034** (0.015)	0.029* (0.015)					0.038*** (0.014)	0.037** (0.014)
H2: Unemp. Prot.			0.000 (0.000)	0.000 (0.000)										
H3: Exp. ALMP					0.001 (0.014)	-0.005 (0.014)								
H4a: Enforce.									-0.118 (0.123)	-0.072 (0.132)			0.043 (0.105)	0.084 (0.112)
H4b: Enablement											0.045 (0.098)	0.012 (0.100)		
Age		-0.005 (0.004)		-0.005 (0.004)		-0.005 (0.005)		-0.007 (0.005)		-0.007 (0.005)		-0.007 (0.005)		-0.007 (0.005)
Age2		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000* (0.000)		0.000* (0.000)		0.000* (0.000)		0.000* (0.000)
Mig. Background		-0.027 (0.020)		-0.030 (0.020)		-0.045** (0.021)		-0.022 (0.023)		-0.024 (0.022)		-0.025 (0.023)		-0.022 (0.023)
Sec. Ed./Appren.		0.084*** (0.026)		0.083*** (0.027)		0.085*** (0.025)		0.080*** (0.030)		0.079*** (0.030)		0.079*** (0.030)		0.080*** (0.030)
Tertiary Edu.		0.035 (0.029)		0.032 (0.029)		0.031 (0.030)		0.013 (0.029)		0.011 (0.029)		0.010 (0.029)		0.013 (0.029)
<i>Random effect variances</i>														
Country	0.041 (0.02)	0.034 (0.018)	0.056 (0.024)	0.045 (0.022)	0.056 (0.03)	0.047 (0.027)	0.022 (0.031)	0.025 (0.031)	0.036 (0.031)	0.037 (0.031)	0.04 (0.033)	0.038 (0.033)	0.021 (0.031)	0.023 (0.032)
Observations	7,698	7,668	7,698	7,668	6,562	6,535	5,035	5,019	5,035	5,019	5,035	5,019	5,035	5,019
No. of cntries.	28	28	28	28	23	23	17	17	17	17	17	17	17	17
<b>GOODNESS OF FIT of the models</b>														
<b>Likelihood ratio test</b>	<b>Model 1</b>	<b>Model 1a</b>	<b>Model 2</b>	<b>Model 2a</b>	<b>Model 3</b>	<b>Model 3a</b>	<b>Model 4</b>	<b>Model 4a</b>	<b>Model 5</b>	<b>Model 5a</b>	<b>Model 6</b>	<b>Model 6a</b>	<b>Model 7</b>	<b>Model 7a</b>
log likelihood	-4167	-4127	-4169	-4129	-3537	-3498	-2708	-2678	-2709	-2679	-2710	-2680	-2708	-2678
Deviance <sup>1</sup> (D <sub>i</sub> )	8334	8254	8338	8258	7074	6996	5416	5356	5418	5358	5420	5360	5416	5356
Decrease (D <sub>0</sub> -D <sub>i</sub> ) <sup>2</sup>	98	146	94	142	82	130	58	102	56	100	54	98	58	102
Degrees of freedom	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 4)	(df = 7)
Chi-squared value	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***

**AVERAGE MARGINAL EFFECTS (AMEs)** based on multilevel mixed-effects logistic regression models; All figures are weighted; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
*All models control for occupational structure (ISCO 1-dig) and sectoral structure (ISIC).*

Table A11. Additional analyses: FEMALE fulltime working employees

VARIABLES	Model 1	Model 1a	Model 2	Model 2a	Model 3	Model 3a	Model 4	Model 4a	Model 5	Model 5a	Model 6	Model 6a	Model 7	Model 7a
<i>Fixed effects</i>														
H1: EPL	0.031*** (0.012)	0.019* (0.010)					0.027** (0.012)	0.015 (0.011)					0.012 (0.013)	0.002 (0.012)
H2: Unemp. Prot.			0.001*** (0.000)	0.001*** (0.000)										
H3: Exp. ALMP					0.015 (0.012)	0.015 (0.009)								
H4a: Enforce.									-0.212*** (0.077)	-0.138** (0.070)			-0.159* (0.095)	-0.127 (0.094)
H4b: Enablement											0.122* (0.069)	0.098* (0.051)		
Age		0.003* (0.002)		0.003* (0.002)		0.004** (0.001)		0.003** (0.002)		0.003** (0.002)		0.003** (0.002)		0.003* (0.002)
Age2		-0.000** (0.000)		-0.000** (0.000)		-0.000*** (0.000)		-0.000*** (0.000)		-0.000*** (0.000)		-0.000*** (0.000)		-0.000*** (0.000)
Mig. Background		-0.102*** (0.014)		-0.103*** (0.015)		-0.101*** (0.017)		-0.130*** (0.012)		-0.129*** (0.012)		-0.130*** (0.012)		-0.129*** (0.012)
Sec. Ed./Appren.		0.101*** (0.016)		0.099*** (0.017)		0.108*** (0.019)		0.088*** (0.018)		0.087*** (0.018)		0.087*** (0.018)		0.088*** (0.018)
Tertiary Edu.		0.108*** (0.017)		0.107*** (0.018)		0.121*** (0.019)		0.107*** (0.022)		0.107*** (0.021)		0.106*** (0.021)		0.107*** (0.021)
<i>Random effect variances</i>														
Country	0.058 (0.018)	0.041 (0.011)	0.061 (0.021)	0.036 (0.013)	0.070 (0.024)	0.043 (0.014)	0.034 (0.015)	0.022 (0.011)	0.031 (0.018)	0.018 (0.014)	0.036 (0.019)	0.018 (0.011)	0.029 (0.017)	0.018 (0.013)
Observations	30,630	30,471	30,630	30,471	26,205	26,068	18,101	18,007	18,101	18,007	18,101	18,007	18,101	18,007
No. of cntries.	28	28	28	28	23	23	17	17	17	17	17	17	17	17
<b>GOODNESS OF FIT of the models</b>														
<b>Likelihood ratio test</b>	<b>Model 1</b>	<b>Model 1a</b>	<b>Model 2</b>	<b>Model 2a</b>	<b>Model 3</b>	<b>Model 3a</b>	<b>Model 4</b>	<b>Model 4a</b>	<b>Model 5</b>	<b>Model 5a</b>	<b>Model 6</b>	<b>Model 6a</b>	<b>Model 7</b>	<b>Model 7a</b>
log likelihood	-14512	-14206	-14512	-14204	-12436	-12173	-8675	-8440	-8674	-8439	-8675	-8439	-8674	-8439
Deviance <sup>1</sup> (D <sub>i</sub> )	29024	28412	29024	28408	24872	24346	17350	16880	17348	16878	17350	16878	17348	16878
Decrease (D <sub>0</sub> -D <sub>i</sub> ) <sup>2</sup>	90	446	90	450	70	396	76	384	78	386	76	386	78	386
Degrees of freedom	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 3)	(df = 6)	(df = 4)	(df = 7)
Chi-squared value	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***	p<0.005 ***

**AVERAGE MARGINAL EFFECTS (AMEs)** based on multilevel mixed-effects logistic regression models; All figures are weighted; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
*All models control for occupational structure (ISCO 1-dig) and sectoral structure (ISIC).*