

The impact of institutional autonomy on higher education institutions in Europe

A multilevel analysis in search of the effects of past reforms



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Do higher levels of institutional autonomy have an effect on the universities' three missions?

Do higher levels of institutional autonomy have an effect on the universities' three missions?



- Empirical test of theoretical propositions in the literature
- Quantitative Evaluation approach for 15 European countries
- Multilevel modelling approach to represent the complexity of the field



HORIZON EUROPE

THE EU RESEARCH & INNOVATION PROGRAMME 2021 – 27



This presentation is based on the political agreement of 11 December 2020 on the Horizon Europe. Information on some parts is pending revision.

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Research and
Innovation

Horizon Europe and higher education

- Raising a large share of the population to tertiary education
- Excellent science in selected key research areas
- Innovation to transform our economy

- Various reforms in higher education
- Organizational autonomy for organizational accountability

- **Increasing pressure on HE institutions to perform better than ever before**



Five Missions Areas



Adaptation to climate change, including societal transformation



Cancer



Healthy oceans, seas, coastal & inland waters



Climate-neutral & smart cities



Soil health & food

Concepts of missions in higher education

- Three major HE missions:
 - Education
 - Research
 - Knowledge transfer

- Additional mission concepts include:
 - International orientation
 - Regional engagement



Concepts of institutional autonomy



- Mostly qualitative designs and theoretical frameworks
- Some concepts for public institutions in general
- **EUA Autonomy Scorecard**
 - Assessment of the national legal framework
 - Four subdimensions
 - Public HE institutions only
 - Survey for 2011 and 2016



Four dimensions of institutional autonomy by the EUA



Organisational autonomy

covering academic and administrative structures, leadership and governance



Financial autonomy

covering the ability to raise funds, own buildings, borrow money and set tuition fees



Staffing autonomy

including the ability to recruit independently, promote and develop academic and non-academic staff



Academic autonomy

including study fields, student numbers, student selection as well as the structure and content of degrees



Do higher levels of institutional autonomy have an effect on the universities' three missions?



○ Hypothesis:

- H1: Higher levels of **institutional autonomy** are expected to have a **negative** effect on the **1st HE mission**.
- H2: Higher levels of **institutional autonomy** are expected to have a **positive** effect on the **2nd HE mission**.
- H3: Higher levels of **institutional autonomy** are expected to have a **positive** effect on the **3rd HE mission**.

Data & Methods

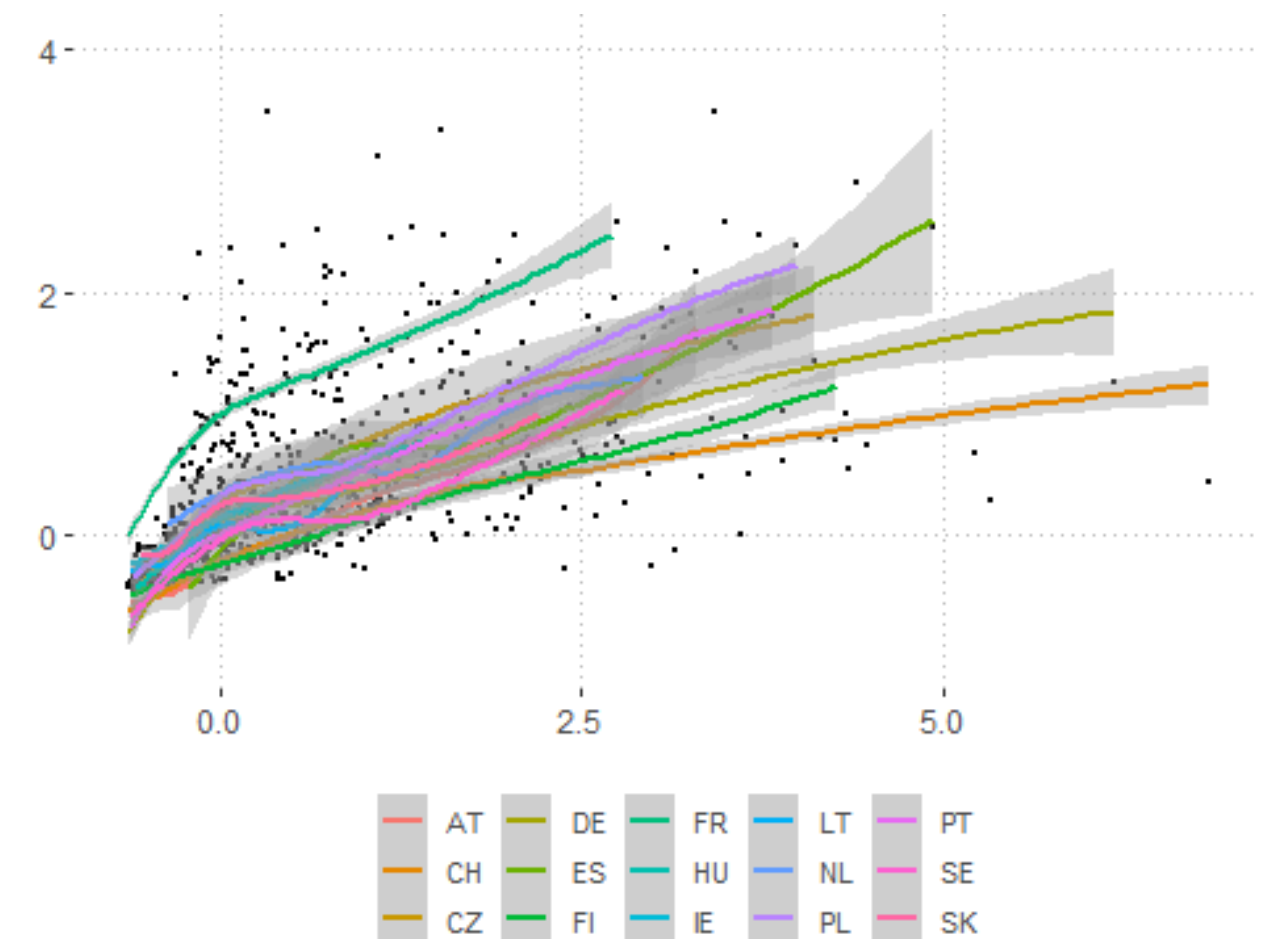
- Secondary data analysis
- Four data sources:
 - European Tertiary Education Register Database (ETER)
 - European University Association Autonomy Scorecard (EUA)
 - Publications database of the Centre for Science & Technology Studies (CWTS Leiden)
 - National economic aggregates (EUROSTAT)
- Data matching:
 - 2011 & 2016
 - 15 countries



Data & Methods



- OLS regression and multilevel regression models
- Sets of four models per mission
- Data structure: strictly nested two-level dataset
 - Level 1: HE institution level
 - Level 2: country level



$$\text{mission outcome} = (\text{HEI level predictors}) + (\text{country level predictors}) + \text{controls} + u_{0S} + \epsilon_{0HS}$$

IV: 1st Mission: Total graduates ISCED 5-7

	M1 OLS		M2 OLS		M3 OLS		M4 ML	
Intercept	0.22	***	0.20	***	0.08		-0.12	
Controls								
Reference Year	-0.11	***	-0.04		0.04		0.01	
Institution level								
Foundation year	0.01				0.02		0.00	
Total academic personnel (FTE)	0.12	***			0.18	***	0.19	***
Total students enrolled ISCED 5-7	1.42	***			1.22	***	1.26	***
HEI Type:								
General	(Ref)				(Ref)		(Ref)	
Technical	-0.04				0.00		-0.13	***
Medical	-0.26	***			-0.24	***	-0.32	***
Economical	0.29	**			0.38	***	0.27	***
Educational	-0.18	**			-0.06		-0.12	*
Other	-0.16	***			-0.18	***	-0.26	***
HEI Category:								
UNI	(Ref)				(Ref)		(Ref)	
UAS	-0.21	***			-0.12	**	0.03	
Other	-0.13	**			-0.09	*	-0.06	
Research active institution	0.00				0.08		0.27	***
Country level								
Real GDP per capita			0.01		0.00		-0.03	
State total educational expenditure			0.01		-0.03		0.03	
Autonomy:								
Organizational Autonomy			-0.11	***	0.01		-0.03	

Number of graduates

1st mission - education

- Organizational no effect
- Financial no effect
- Staffing no effect
- Academic no effect

- No effects of any form of autonomy

- Strong effects of HEI size, HEI Type indicators and research active institutions

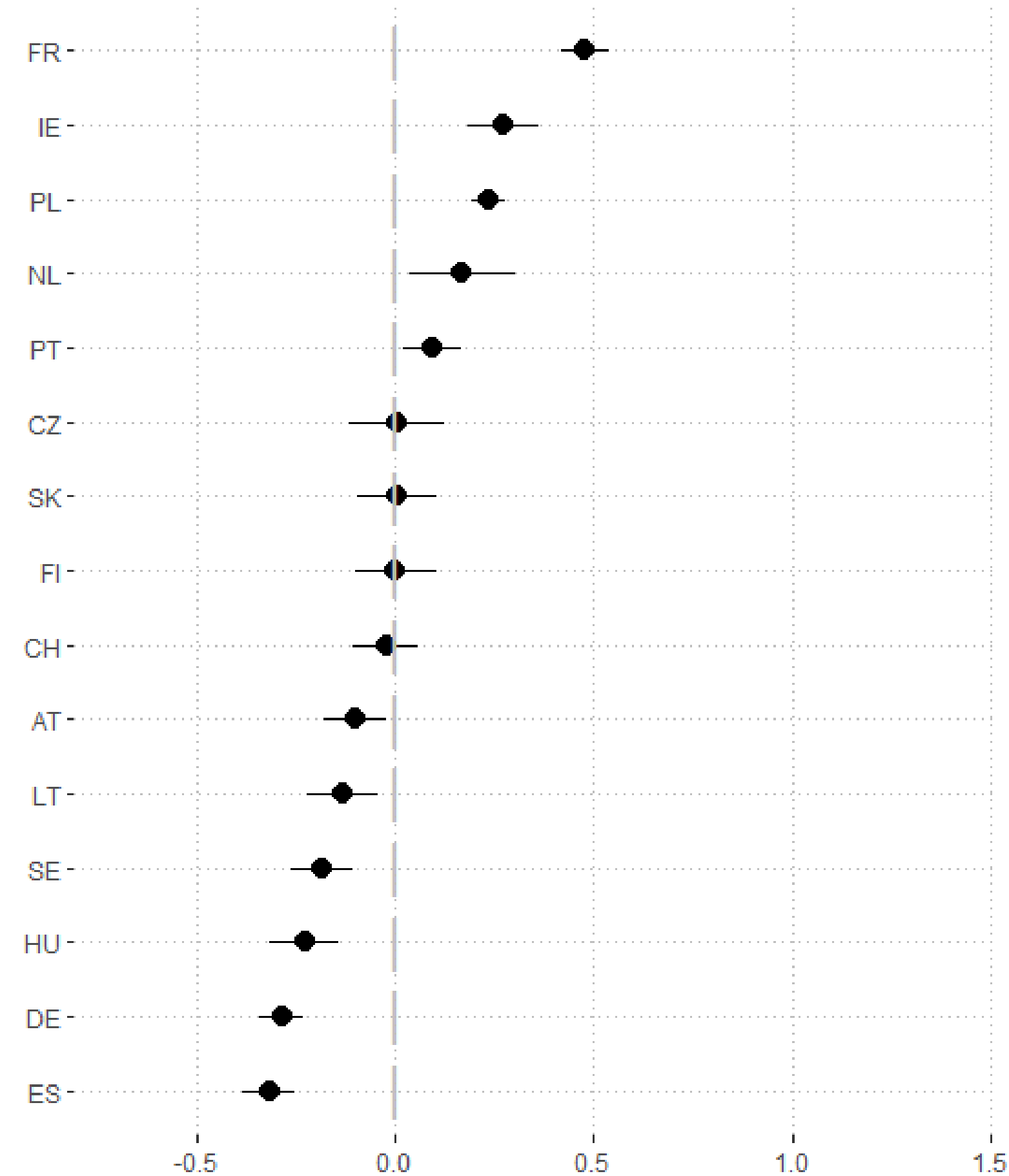
IV: 1st Mission: Total graduates ISCED 5-7

	M1 OLS	M2 OLS	M3 OLS	M4 ML
Intercept	0.22 ***	0.20 ***	0.08	-0.12
Controls				
Reference Year	-0.11 ***	-0.04	0.04	0.01
Institution level				
Foundation year	0.01		0.02	0.00
Total academic personnel (FTE)	0.12 ***		0.18 ***	0.19 ***
Total students enrolled ISCED 5-7	1.42 ***		1.22 ***	1.26 ***
HEI Type:				
General	(Ref)		(Ref)	(Ref)
Technical	-0.04		0.00	-0.13 ***
Medical	-0.26 ***		-0.24 ***	-0.32 ***
Economical	0.29 **		0.38 ***	0.27 ***
Educational	-0.18 **		-0.06	-0.12 *
Other	-0.16 ***		-0.18 ***	-0.26 ***
HEI Category:				
UNI	(Ref)		(Ref)	(Ref)
UAS	-0.21 ***		-0.12 **	0.03
Other	-0.13 **		-0.09 *	-0.06
Research active institution	0.00		0.08	0.27 ***
Country level				
Real GDP per capita		0.01	0.00	-0.03
State total educational expenditure		0.01	-0.03	0.03
Autonomy:				
Organizational Autonomy		-0.11 ***	0.01	-0.03
Financial Autonomy		-0.08	-0.10 ***	-0.05
Academic Autonomy		-0.14 ***	-0.07 ***	-0.06
Staffing Autonomy		-0.11 ***	-0.15 ***	-0.07
Model quality parameters				
R ² Conditional R ²	0.64	0.10	0.68	0.797
Adj. R ² Marginal R ²	0.63	0.10	0.68	0.708
Likelihood Ratio Test				2.2e-16 ***
N	1151	1151	1151	1151
Variance components:				
Institution Level				0.812
Country Level				0.188
Explained Variance:				
Country Level (Adj. ACC)				0.305
AIC				810.68
BIC				916.69

Number of graduates

1st mission - education

- M4 ML Group Intercepts (Countries):
- Highest country average: FR, IE & PL
- Lowest country average: ES, DE, HU



IV: 2nd Mission: Number of publications

	M1 OLS		M2 OLS		M3 OLS		M4 ML	
Intercept	0.10		0.22	***	-0.09		-0.08	
Controls								
Reference Year	0.12	**	0.29	***	0.23	***	0.22	***
Institution level								
Foundation year	-0.08	*			-0.08	***	-0.06	***
Total academic personnel (FTE)	0.82	***			0.76	***	0.80	***
Total students enrolled ISCED 5-7	-0.46	***			-0.24	*	-0.34	***
HEI Type:								
General	(Ref)				(Ref)		(Ref)	
Technical	0.04				0.13	**	0.08	
Medical	-0.25	*			-0.08		0.02	
Economical	-0.24				-0.06		0.01	
Educational	-0.13				-0.12		0.10	
Other	-0.06				-0.04		0.02	
HEI Category:								
UNI	(Ref)				(Ref)		(Ref)	
UAS	-0.25	***			-0.39	***	-0.32	***
Other	0.10				-0.06		0.06	
Research active institution	0.02				0.03		0.03	
Country level								
Real GDP per capita			0.22	***	0.17	***	0.10	
State total educational expenditure			0.14	*	0.08	*	0.11	
Autonomy:								
Organizational Autonomy			-0.09		0.12	***	-0.03	

Number of publications

2nd mission - research

- Organizational no effect
- Financial no effect
- Staffing small positive
- Academic small negative

- Conflicting effects of staffing and academic autonomy

- Strong and significant effects of HEI age, HEI size and HEI category

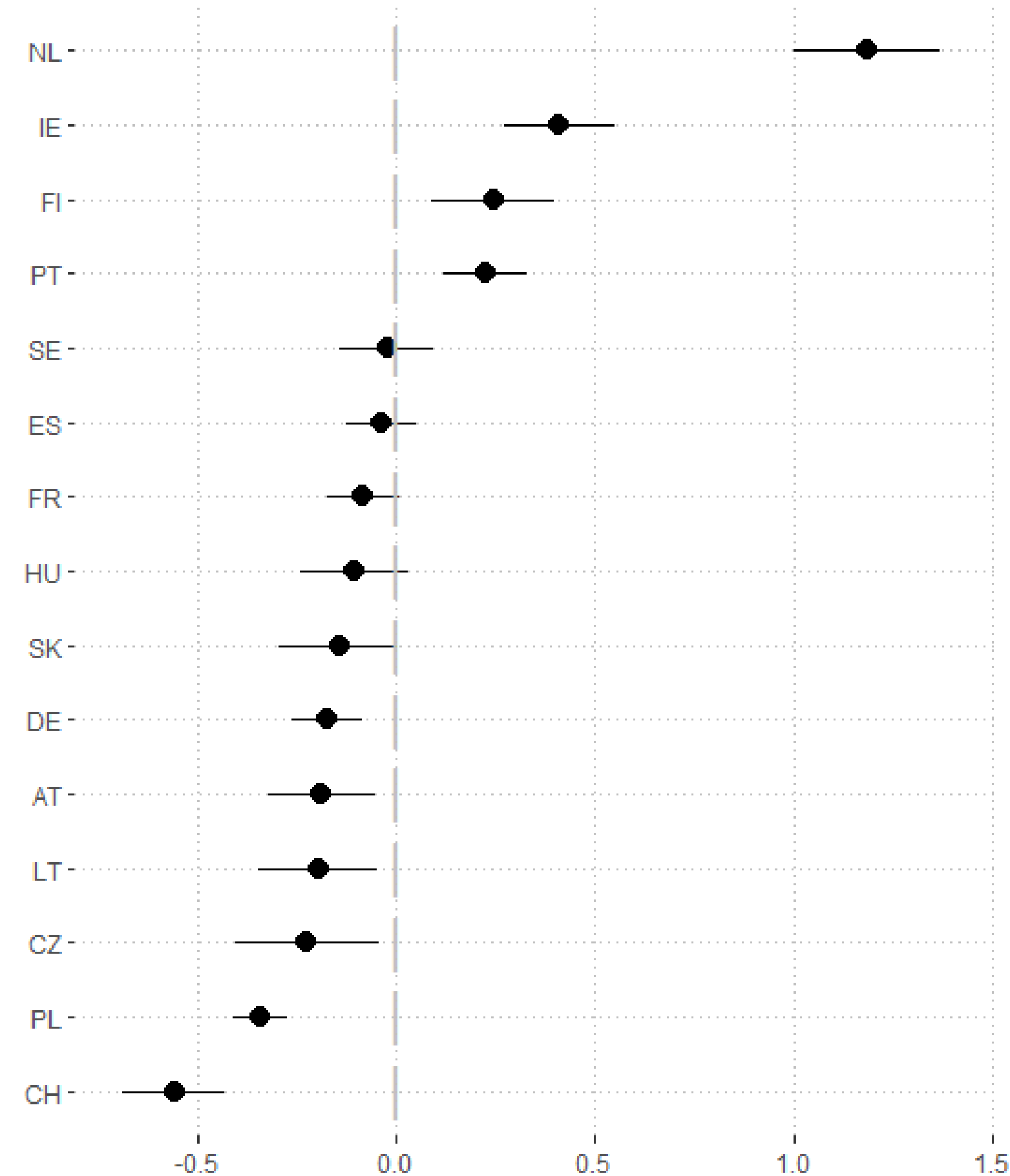
IV: 2nd Mission: Number of publications

	M1 OLS	M2 OLS	M3 OLS	M4 ML
Intercept	0.10	0.22 ***	-0.09	-0.08
Controls				
Reference Year	0.12 **	0.29 ***	0.23 ***	0.22 ***
Institution level				
Foundation year	-0.08 *		-0.08 ***	-0.06 ***
Total academic personnel (FTE)	0.82 ***		0.76 ***	0.80 ***
Total students enrolled ISCED 5-7	-0.46 ***		-0.24 *	-0.34 ***
HEI Type:				
General	(Ref)		(Ref)	(Ref)
Technical	0.04		0.13 **	0.08
Medical	-0.25 *		-0.08	0.02
Economical	-0.24		-0.06	0.01
Educational	-0.13		-0.12	0.10
Other	-0.06		-0.04	0.02
HEI Category:				
UNI	(Ref)		(Ref)	(Ref)
UAS	-0.25 ***		-0.39 ***	-0.32 ***
Other	0.10		-0.06	0.06
Research active institution	0.02		0.03	0.03
Country level				
Real GDP per capita		0.22 ***	0.17 ***	0.10
State total educational expenditure		0.14 *	0.08 *	0.11
Autonomy:				
Organizational Autonomy		-0.09	0.12 ***	-0.03
Financial Autonomy		0.31 ***	0.22 ***	0.03
Academic Autonomy		0.08	-0.26 ***	0.17 *
Staffing Autonomy		-0.17 **	0.03	-0.23 *
Model quality parameters				
R ² Conditional R ²	0.72	0.11	0.78	0.832
Adj. R ² Marginal R ²	0.72	0.10	0.77	0.704
Likelihood Ratio Test				2e-16 ***
N	904	904	904	904
Variance components:				
Institution Level				0.633
Country Level				0.367
Explained Variance:				
Country Level (Adj. ACC)				0.432
AIC				1243.88
BIC				1344.82

Number of publications

2nd mission - research

- M4 ML Group Intercepts (Countries):
- Highest country average: NL, IE & FI
- Lowest country average: CH, PL, CZ



IV: 3rd Mission: Total third-party funding (EURO)

	M1 OLS		M2 OLS		M3 OLS		M4 ML	
Intercept	-0.11		0.00		-0.07		0.21	
Controls								
Reference Year	0.08	*	0.08		0.04		-0.07	
Institution level								
Foundation year	-0.10	***			-0.10	***	-0.08	***
Total academic personnel (FTE)	0.65	***			0.55	***	0.60	***
Total students enrolled ISCED 5-7	-1.11	***			-0.76	***	-0.94	***
HEI Type:								
General	(Ref)				(Ref)		(Ref)	
Technical	-0.02				0.05		0.03	
Medical	-0.19				-0.11		-0.07	
Economical	-0.13				-0.06		0.08	
Educational	-0.11				-0.25	**	-0.02	
Other	-0.15	*			-0.04		0.02	
HEI Category:								
UNI	(Ref)				(Ref)		(Ref)	
UAS	-0.06				-0.09		-0.13	**
Other	0.01				-0.09		-0.17	**
Research active institution	0.04				-0.13	*	-0.33	***
Country level								
Real GDP per capita			0.16	***	0.11	***	0.14	*
State total educational expenditure			0.18	***	0.08	*	0.03	
Autonomy:								
Organizational Autonomy			-0.02		-0.05		-0.04	

Total third-party funding

3rd mission – knowledge transfer

- Organizational no effect
- Financial no effect
- Staffing small positive
- Academic small negative

- Conflicting effects of staffing and academic autonomy

- Strong and significant effects of HEI age, HEI size and HEI category and research active institutions

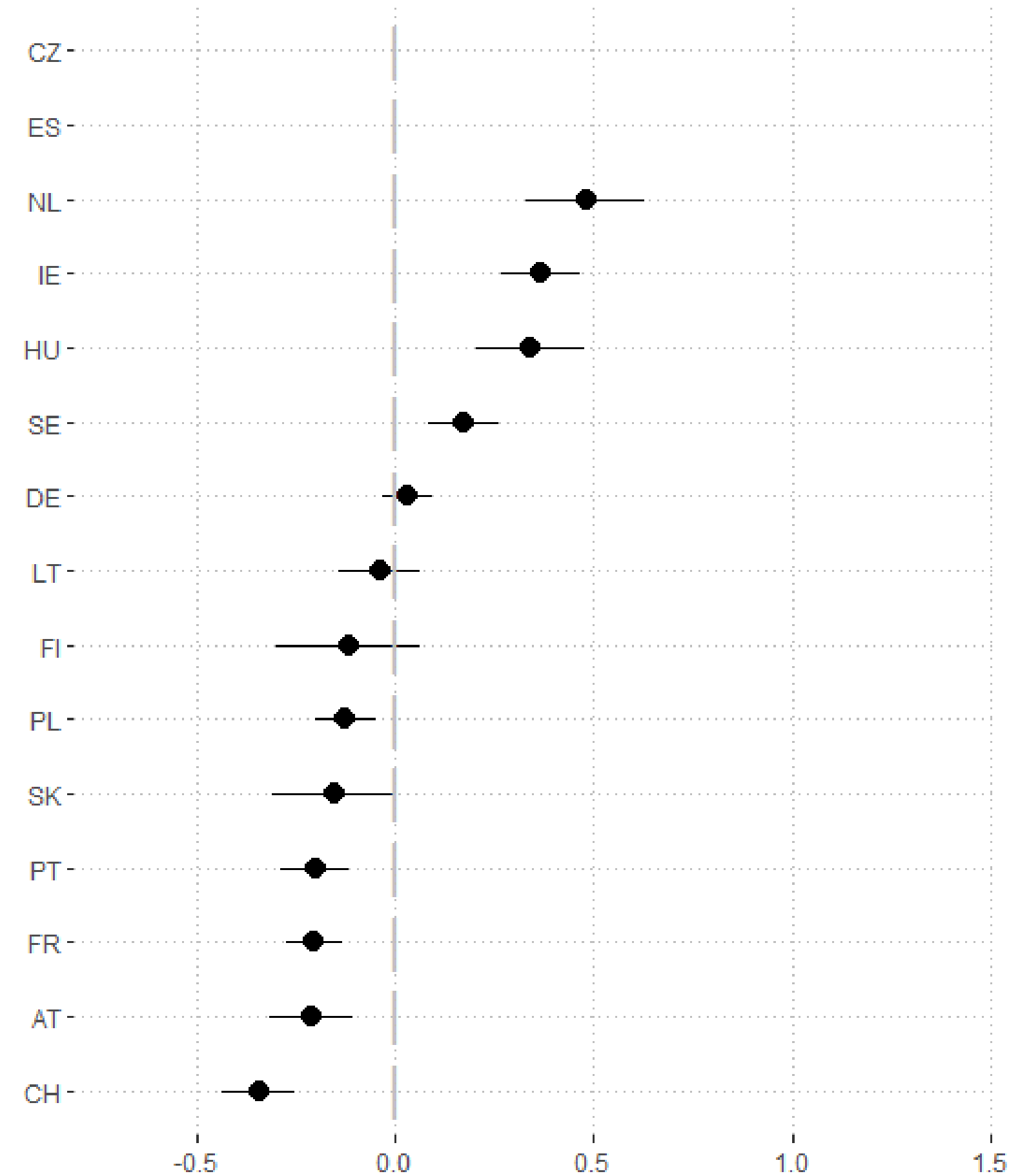
IV: 3rd Mission: Total third-party funding (EURO)

	M1 OLS	M2 OLS	M3 OLS	M4 ML
Intercept	-0.11	0.00	-0.07	0.21
Controls				
Reference Year	0.08 *	0.08	0.04	-0.07
Institution level				
Foundation year	-0.10 ***		-0.10 ***	-0.08 ***
Total academic personnel (FTE)	0.65 ***		0.55 ***	0.60 ***
Total students enrolled ISCED 5-7	-1.11 ***		-0.76 ***	-0.94 ***
HEI Type:				
General	(Ref)		(Ref)	(Ref)
Technical	-0.02		0.05	0.03
Medical	-0.19		-0.11	-0.07
Economical	-0.13		-0.06	0.08
Educational	-0.11		-0.25 **	-0.02
Other	-0.15 *		-0.04	0.02
HEI Category:				
UNI	(Ref)		(Ref)	(Ref)
UAS	-0.06		-0.09	-0.13 **
Other	0.01		-0.09	-0.17 **
Research active institution	0.04		-0.13 *	-0.33 ***
Country level				
Real GDP per capita		0.16 ***	0.11 ***	0.14 *
State total educational expenditure		0.18 ***	0.08 *	0.03
Autonomy:				
Organizational Autonomy		-0.02	-0.05	-0.04
Financial Autonomy		0.30 ***	0.11 **	-0.02
Academic Autonomy		0.25 ***	0.16 ***	0.16 *
Staffing Autonomy		-0.09 *	-0.07 **	-0.15 *
Model quality parameters				
R ² Conditional R ²	0.65	0.20	0.70	0.775
Adj. R ² Marginal R ²	0.64	0.19	0.69	0.666
Likelihood Ratio Test				2.2e-16 ***
N	739	739	739	739
Variance components:				
Institution Level				0.643
Country Level				0.357
Explained Variance:				
Country Level (Adj. ACC)				0.325
AIC				707.10
BIC				803.81

Total third-party funding

3rd mission – knowledge transfer

- M4 ML Group Intercepts (Countries):
- Highest country average: NL, IE & HU
- Lowest country average: CH, AT, FR



Results



- Institutional autonomy has only minor effects on the three missions
- The few effects for institutional autonomy found are conflicting
- Older and larger HE institutions perform better in all three missions
- Other influences vary for each mission

Possible Explanations

- Autonomy shift:
 - Internal shifts in rights, competences or freedoms
 - Net autonomy might not have increased

Possible Explanations

- Measurement & data issues
 - Autonomy measurements might need improvement
 - Extending the data to more countries
 - Data for longer time periods might uncover effects

Implications

- Raising questions about quality and implementation of reforms in HE
- Challenge to the optimistic view on institutional autonomy in the literature
- Focus on internal shifts in autonomy inside HE institutions

Possible future research

- Studies on internal shifts in autonomy
- Improving measurements for autonomy
- Extend autonomy data to private HEIs
- Extend autonomy data to longer time periods



Questions?