
Governance, achievement and selectivity of schools Austrian results of PISA 2006

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Research interest

- Austria is characterised by a complex structure of coordination and regulation of its educational system
- Such system is inequitable and also inefficient
- In depth analysis of PISA 2006 data to better understand the relationship between school governance in Austria and student performance, taking into account that
 - It's difficult to attribute the scores to the characteristics of the schools they were measured in because of tracking
 - Differences in school level variables depend on the educational programme / school type
 - Set of PISA governance variables has certain limits to comprehend the bureaucratic structure of the Austrian system

The concept of (school)-governance

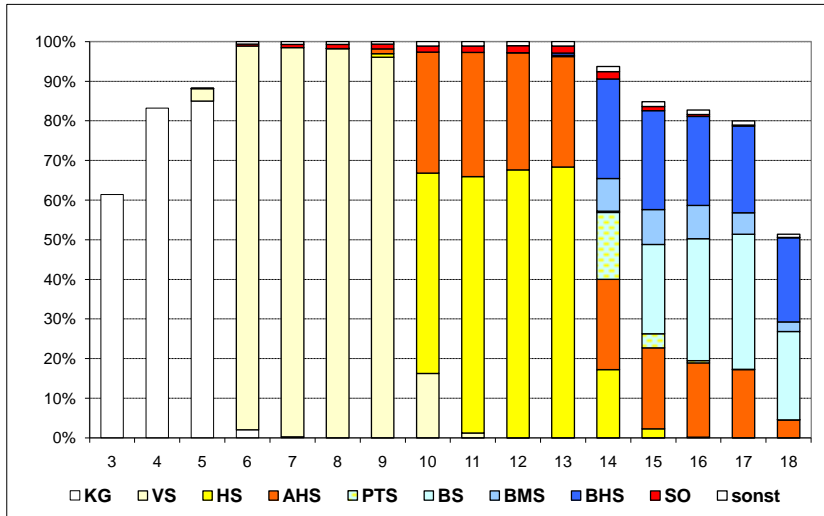
- As opposed to political steering, „governance is the hallmark of an institutionalist approach dealing with regulatory structures combining public and private, hierarchical and network forms of action coordination.“ (Renate Mayntz)
- The paradigm of steering and the hierarchical form of coordination is predominant in A
- We therefore expect little variation at school level as well as limited influence of other actors/groups (schools, parents, ...)

Data: 5 groups of governance variables

1. School resources: human, material and educational; science promotion (9 vars)
 2. School autonomy and management (4 vars)
 3. Quality assurance: use of achievement data plus national QA-add on (5+5 vars)
 4. Process: grouping, admitting and selecting plus national reading promotion-add on (4+6vars)
 5. Parents-variables: competition, pressure, accountability (5 vars)
- Plus controlling for educational tracks (school types) and socio-economic background variables (5+10 vars)

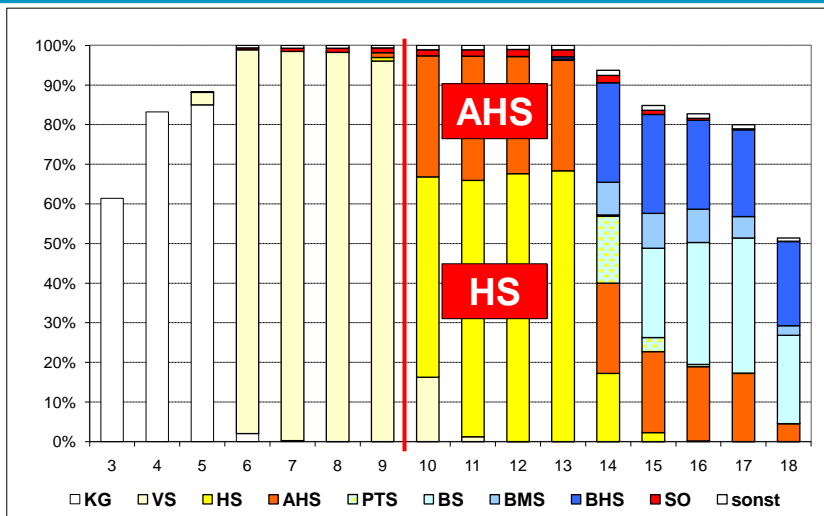
Participation in education at age 3-18

with 3 selections, according to achievement AND background conditions



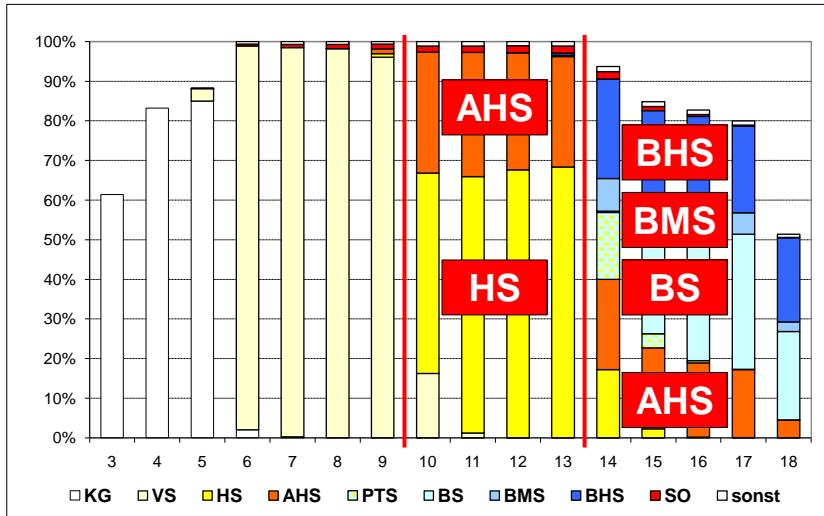
First tracking after grade 4 at age of 10

Academic school (AHS) offers places for 1/3, others attend general school (HS)

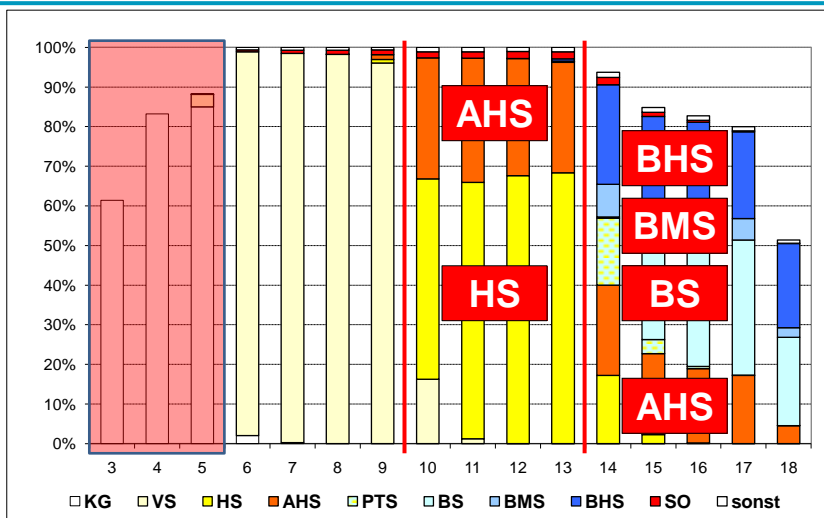


Second tracking one year before PISA!

different vocational schools & dual training (selective schools: AHS, BHS)



Plus unequal pre-primary participation



Main research questions

- Do the PISA variables establish a better understanding of the Austrian school governance regime?
- To which degree do the “inputs” (benefits of better background characteristics) influence achievement, compared to the governance variables?
- Are schools utilising governance mechanisms to optimise the procedure of selecting better students?
- How do the governance variables relate to students’ background and achievement in other selective systems and in more comprehensive systems? (in progress)

Method

- Descriptive analysis of school governance as compared to expected institutional effects derived from a model of educational production
- 2-level analysis: simple random coefficient models using MLwiN
 - Dep. variable: pv1-pv5science
 - Imputation of missing values using dummy var. adjustment
 - OLS-estimation to check robustness (PV-est. using rep. weights)
- Are Governance-factors influencing selection at school level
 - same MLA but only for selective schools
 - logistic models to determine the effects of the school level variables to the selectivity

Institutional effects in a model of educational production (Bishop & Wößmann 2004)

Positive effects	Negative effects
Central examinations	School autonomy in examinations
Standard setting and performance control	
School autonomy in process decisions and in personnel management	School autonomy in budgetary matters
Administrative decision-making at intermediate level	
Influence of teachers on the methods of teaching	Teachers influence on their salaries and workload
Regular scrutiny of the performance level of students	
Parental influence and competition from private schools	Powerful teacher unions (workload & political process)

What else tell us the PISA school level data (principals perception)

- Selection strongly based on academic achievement and special needs
- Ability grouping not relevant (is done by the system!)
- Competition, parental influence and use of achievement data very weak (but things change: national standards!)
- Schools have almost no decision-making responsibility for appointing and dismissing teachers and their salaries
- government has considerable resp. for assessment policies (but up to now no central examination)
- Strong influence of business/industry on curriculum

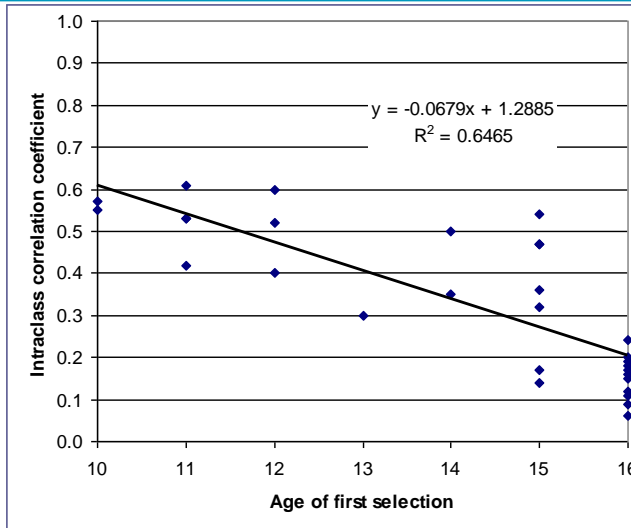
6 Multilevel models

- **A:** Empty
- **B:** Tracks (controlling for different school types)
- **C:** Background (regional and socio-economic v.)
- **D:** Tracks + background
- **E:** Governance (all groups of variables: school resources, governance, QA, process, parents)
- **F:** Full Model (governance + tracks + background)

Empty Model: intra-class correlation

- Total variance of 10,013 is decomposed
 - Between school var.: 5,610
 - Within school var.: 4,403
- $\rho = .56$
- Intercept: 503

intra class correlation and selection



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Model B: Educational tracks

	B	SE
Intercept	433.3	9.5
Secondary academic school (AHS-upper level)	148.9	10.3
Pre vocational year (PTS, 1 year BMS)	5.0	10.9
Apprenticeship training school (BS)	25.7	10.6
Vocational school, 3-4 years (BMS)	37.6	13.4
Vocational college (BHS)	126.2	10.2
Between school variance % of total	1671	30%
Within school variance % of total	4422	100%
(intraclass correlation coefficient)	(.27)	

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Model C: Background variables

	B	SE
Intercept	413.6	9.1
School located in small town/village (< 15,000 people)	13.2	6.7
School located in a city (with over 100,000 people)	5.9	6.4
School size	5.8	1.7
School size squared	-0.1	0.1
School average PISA ESCS index	96.9	5.6
Student's PISA ESCS index	7.0	1.6
Student's PISA ESCS index squared	-3.6	1.0
Student is female	-13.2	4.8
Student has no immigration background	36.7	6.2
Student speaks the test language at home	22.0	7.6
Between school variance % of total	1608	29%
Within school variance % of total	4095	93%
(intraclass correlation coefficient)	(.28)	

Model D: Tracks & Background variables

	B	SE
Intercept	396.2	11.0
Secondary academic school (AHS-upper level)	82.4	10.5
Pre vocational year (PTS, 1 year BMS)	6.7	8.4
Apprenticeship training school (BS)	15.9	7.7
Vocational school, 3-4 years (BMS)	39.9	9.4
Vocational college (BHS)	88.0	8.2
School located in small town/village (< 15,000 people)	7.2	5.5
School located in a city (with over 100,000 people)	8.8	5.4
School size	0.7	1.6
School size squared	0.0	0.1
School average PISA ESCS index	60.3	7.6
Student's PISA ESCS index	6.3	1.7
Student's PISA ESCS index squared	-3.5	1.0
Student is female	-19.6	3.9
Student has no immigration background	36.8	6.2
Student speaks the test language at home	22.2	7.6
Between school variance % of total	846	15%
Within school variance % of total	4096	93%
(intraclass correlation coefficient)	(.17)	

	E: GOV		F: FULL	
	B	SE	B	SE
Intercept	502.8	24.0	397.1	25.1
School resources variables (6 of 9 sig.)				
Student-teacher ratio	3.4	1.0	0.7	1.0
School average students' learning time for regular lessons	15.4	2.2	8.2	1.8
... for out-of-school lessons	-26.9	5.3	-12.9	3.6
... for self-study/homework	-10.2	2.8	-2.2	2.0
School providing opportunity of taking science	-28.3	18.2	-35.8	16.1
School average index of school activities to promote science	10.6	3.2	2.7	2.6
Quality assurance (3 of 10 sig.)				
School using achievement data for allocation resources	-16.9	7.3	-8.6	5.6
School with achievement data tracked over time	18.4	5.9	5.5	4.4
Mandatory guidelines for QA	-27.6	9.4	-16.9	6.1
Recommendation for QA	-20.2	8.7	-11.9	5.8
Process (4 of 9 sig.)				
School with low academic selectivity of school admittance	-27.9	9.9	-7.2	7.7
School average percentage of students repeating a grade	-1.5	0.7	-1.1	0.4
School average class size max. 20 (in test language, ref.: 21-30)	-23.2	8.1	1.6	5.6
School average percentage of students with problems in reading	-5.4	1.8	-1.5	1.3
Parents (1 of 5 sig.)				
School informing parents of children's performance relative to other students in the school	8.4	5.8	10.0	4.4

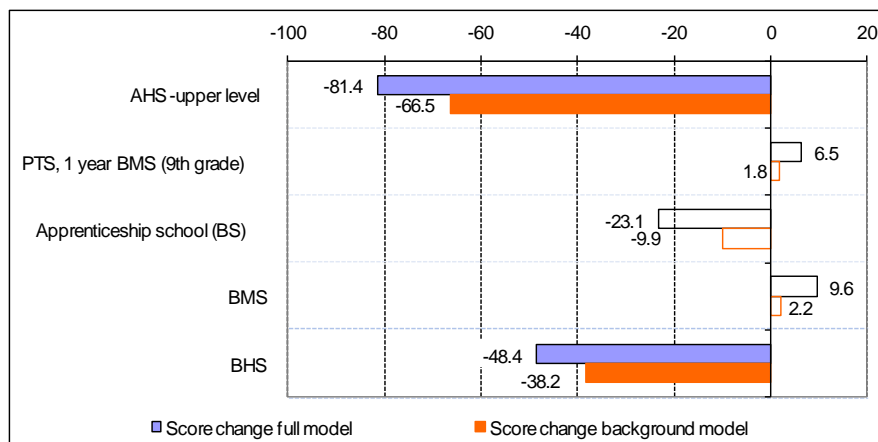
Model E+F: Tr. + BG, Variance

	E: Gov		F: FULL	
	B	SE	B	SE
Secondary academic school (AHS-upper level)			67.5	9.8
Pre vocational year (PTS, 1 year BMS)			11.5	9.7
Apprenticeship training school (BS)			2.6	14.4
Vocational school, 3-4 years (BMS)			47.3	11.5
Vocational college (BHS)			77.8	10.8
School located in small town/village (< 15,000 people)			4.4	5.1
School located in a city (with over 100,000 people)			13.0	5.6
School size			2.2	2.0
School size squared			0.0	0.1
School average PISA ESCS index			44.0	8.1
Student's PISA ESCS index			6.3	1.6
Student's PISA ESCS index squared			-3.5	1.0
Student is female			-19.6	3.4
Student has no immigration background			35.4	6.1
Student speaks the test language at home			23.4	7.7
Between school variance % of total	1288	23%	464	8%
Within school variance % of total	4412	100%	4026	91%
(intraclass correlation coefficient)	(.23)		(.10)	

Absent and present effects in A

Positive effects	Negative effects
Central examinations	School autonomy in examinations
Standard setting and performance control	
School autonomy in process decisions and in personnel management	School autonomy in budgetary matters (intermediate level resp. for material expenditure)
Administrative decision-making at intermediate level	
Influence of teachers on the methods of teaching	Teachers influence on their salaries and workload
Regular scrutiny of the performance level of students	
Parental influence and competition from private schools	Powerful teacher unions (workload & political process)

Change in score after accounting for background & governance variables



Governance-factors and selectivity of schools

- We find different effects of governance variables if we limit our analysis to selective schools only
 - School autonomy in staffing (+8), budgeting (-27 per S.D.)
 - Quality of educational resources (+15 per S.D)
 - student/teacher ratio (-8, per 1 add. st.) & class sizes in test language <21 (+38, ref: 21-30)
 - Achievement data is tracked over time (+11)
 - Informing parents relative to other schools (+43)
- Also within selective schools, student achievement is **highly influenced by background factors**
- Selective schools do not seem to use their governance options to improve the selection process

Conclusion

- For an in-depth analysis of institutional effects, to us it seems inevitable to take into account the local, regional and national characteristics of educational systems – in comparative perspective
- For policy makers in Austria, it is still a big topic how to deal with the strong association between the different educational tracks/school types and the socio-economic composition of schools
- Most of the performance differences can be explained by selection processes at the system level, whereas schools „productive“ efforts do not make the difference

Next steps

- Meta-analysis of various systems
 - with early selection (AUT, CZE, DEU, NLD)
 - more comprehensive systems (CHE, DNK, FIN, GBR, SWE)
- separate analyses for each country following the framework applied here
- 2-level analyses together for all countries, and adding information at the system level:
 - age of first selection,
 - % of VET students, relation VET-LM (school leavers, unempl.)
 - governance model, degree of centralisation and standardisation
 - quality assurance, monitoring and evaluation

▪ **Thank you!**