Importance of vocational education

- Youth unemployment
- Instilling technological knowledge
- Academically less able students
- Lack of middle level technicians
- Poverty among urban dwellers
- Economic globalization

But…evidence lacking

- *Vocational school fallacy* (Foster 1965)
- Evaluations from randomized training programs in US show modest effects (Heckman)
- Cost-benefit studies show lower returns & higher costs for vocational
- Fewer evaluations – randomized or otherwise – undertaken on impacts of vocational *education*
- Earlier assessments of vocational education (Colombia, Tanzania) found that most graduates go to university rather than entering manual occupations (Psacharopoulos, Loxley 1985)

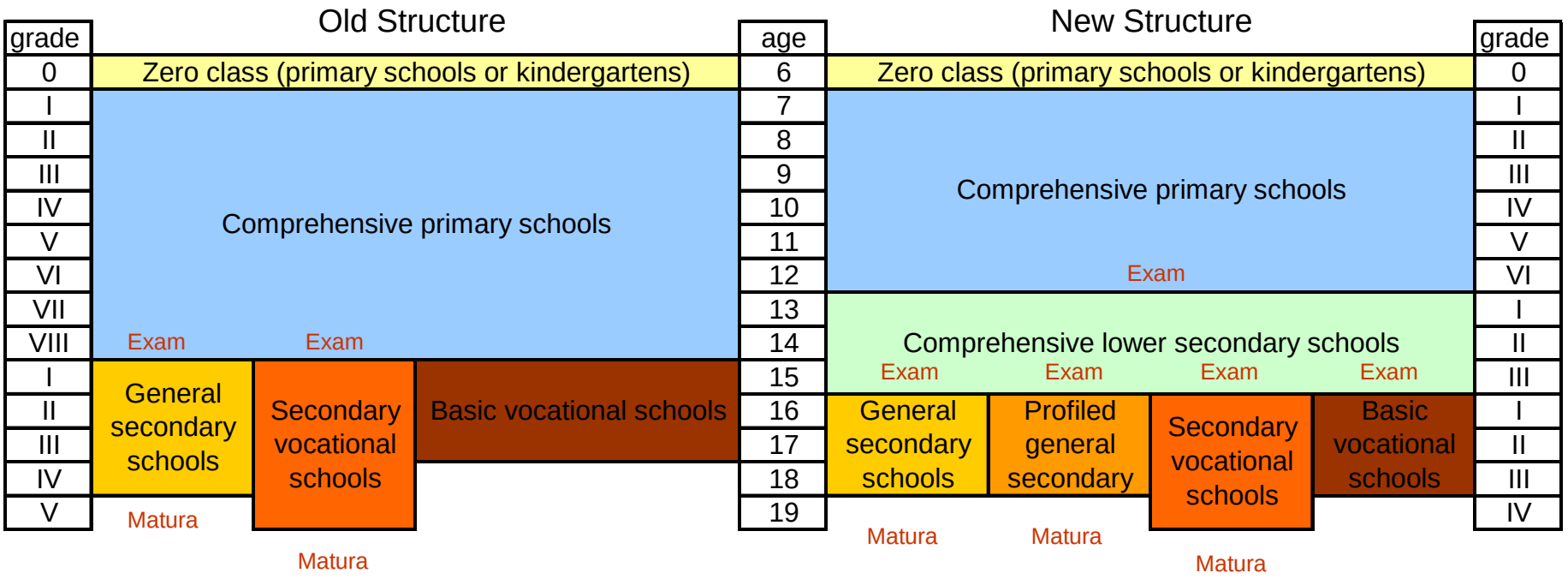
Goals of 1999 reform in Poland

- Raising the level of education in society
- Ensuring equal educational opportunities
- Supporting improvements in quality

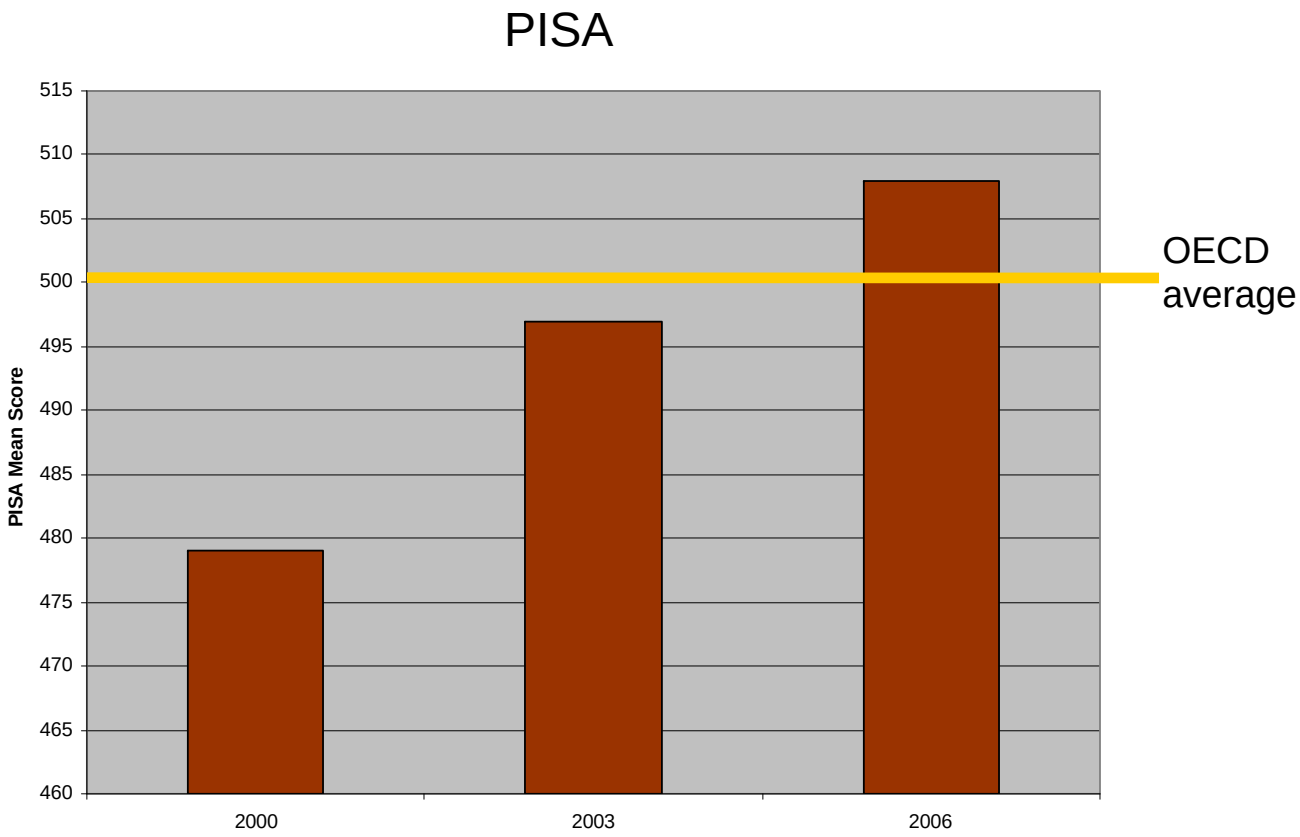
Main aspects of 1999 reform

- Introduction of new structure of school system
- Changes in administration & supervision
- Curricular reform
- Independent assessment & examination system
- School finance
- Qualification requirements for teachers

Change in structure of system



Impressive gains in Poland



Hypotheses for explaining change

- All transition countries improved over time
- Students more accustomed to taking tests
- Reform led to improvement

Results of matching

Factual and counterfactual scores of students in different upper secondary tracks							
Reading achievement 9th grade 1st plausible value individual scores	PISA 2000 factual weighted mean score (obs)	PISA 2003 factual weighted mean score (obs)	PISA 2003 matched counterfactual score (matched obs)		PISA 2006 factual weighted mean score (obs)	PISA 2006 matched counterfactual score (matched obs)	
			Kernel matching	*1-1 matching*		*Kernel matching*	*1-1 matching*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
All schools	480.0 (3654)	501.7 (4196)	495.6 (4151)	499.3 (2528)	513.8 (5233)	517.3 (5229)	514.6 (3056)
ISCED 3C schools (vocational)	357.8 (983)	-	444.5 (4010)	453.3 (926)	-	472.4 (5141)	476.0 (1090)
ISCED 3B schools (technical)	480.4 (1491)	-	487.0 (4150)	487.9 (1527)	-	503.8 (5163)	504.5 (1823)
ISCED 3A schools (general)	543.7 (1180)	-	524.6 (4064)	528.2 (1233)	-	545.8 (5221)	553.2 (1376)
ISCED 3A and 3B schools	514.6 (2671)	-	507.9 (4157)	506.1 (2206)	-	527.5 (5233)	525.9 (2609)

Results of matching

Relative score change (difference-in-differences) for students in vocational schools				
Relative score change	from PISA 2000 to PISA 2003		from PISA 2000 to PISA 2006	
	Kernel matching	*1-1 matching*	*Kernel matching*	*1-1 matching*
ISCED 3C versus ISCED 3A+3B	93.4	103.0	101.7	107.0
ISCED 3C versus ISCED 3A	105.9	109.8	112.5	108.8
ISCED 3C versus ISCED 3B	80.2	86.7	91.2	94.2

Do Results Hold over time?

Estimates of Relative Differences in Achievement in Vocational and Other Tracks in 2000 and 2006, and for the 10th and 11th grade **special sample** of PISA

	2000 9th grade	2006 10th grade	2006 11th grade
ISCED 3A + 3B	514.6	544.9	551.9
ISCED 3C	357.8	389.2	385.6
Difference	156.8	155.7	166.4

Conclusions

- Thus, reform led to improvement – through delay of vocational, more relevant inputs (hours, motivation, better teachers, etc.)
- The pathway is through increased hours of math instruction & increased motivation
- Unfortunately once students enter senior secondary, vocational track comes back and scores of vocational students suffer

- Evaluations of training programs are good & very important
- But these training programs can be expensive and probably localized so not accessible to all
- Need to streamline at least general training in education systems

- Education system should be responsive to economic demands
- De-emphasize vocationalization
- There should be different pathways in education
- Options of entry and reentry between vocational & general education – not dead-end vocational
- Important to build broader & general skills at earlier stage
- Specialize later
- Use public-private partnerships in training and technical education

- Public-private partnerships (eg, vouchers), in developing countries
- School re-entry programs
- Savings accounts