

# A Comparative Analysis of the Austrian Model of Formation of Competence

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# agenda

- research questions
- basic approach
- methodology
- results

# ...based on a study published in German in a broader Austrian research project...

- Lassnigg, Lorenz; Vogtenhuber, Stefan (2014), Das österreichische Modell der Formation von Kompetenzen im Vergleich, in: Statistik Austria (Hrsg.), Schlüsselkompetenzen von Erwachsenen – Vertiefende Analysen der PIAAC-Erhebung 2011/12, Statistik Austria, Wien, S. 49-79.

- Internet (in German):

chapter: [http://www.equi.at/dateien/lassnigg-vogtenhuber\\_2014\\_ko.pdf](http://www.equi.at/dateien/lassnigg-vogtenhuber_2014_ko.pdf)

presentation at conference:

<http://www.equi.at/dateien/lassnigg-piaac-wien-pres.pdf>

detailed research report: <http://www.equi.at/dateien/IHS-PIAAC.pdf>

# research questions

- How are **structural traits of education systems** (differentiation of VET/general education; achievement tracking) related to results to **PIAAC competence scores** (level and distribution)?
  - How do **structures of VET** (early VET or late; proportion of VET in initial education) influence the competence level and distribution?
- Can we trace **signs of past reforms** in different countries in the competences of the adult population through **age specific patterns** of achievement?

# basic approach 1

- PIAAC observes competences of 16-65-y **population**...
- ...as a result of overall process of **competence/skills production**...
- ...and can be traced back to **the timing of school careers**...
- ...which is also related to concurrent **political / policy** measures...
  - ...having occurred in parallel to the education careers, and have cumulated to **more or less coherent frameworks/mixtures of institutions and practices**
- ...so certain **age groups** have been exposed at certain **stages of careers** to certain **political periods** (reforms)...
- ...the **question** is, whether we can see signs of these policies in the **age-specific competenc(i)es** measured by PIAAC...
  - ...or at least, how the political process is related to the age specific competenc(i)es

# basic approach 2

- ...we can also ask, whether certain **current educational structures** are related to the **current competenc(i)es** (cross-section)...
- ...having in mind that these structures **have evolved** in a certain (path-dependent) way through the competence formation processes of the observed population...
- ...in this cross-sectional perspective the politics/policies exert their **cumulative influence**...
  - ...here constellations **without much reform** can be compared with constellations that have mainly performed the **1st reform wave** of the 1960s or the **2nd wave** from the 1980s, or **both**
- problem in the data: **adult learning** has **not been observed** in a sufficient way (only participation in year before measurement)...
  - ...however, so far the effects of AL have **not been proven to be substantial** in their own right (rather the initial stage has much stronger effects)



# PIAAC-age groups and timing of education policy

1954-77  
in  
education

1980s education policy

TERT	1966-77	1972-82	1977-87	1982-92	1987-97	1992-02	1997-07	2002-12	2007-17	2012-22
SEK II	1962-72	1968-76	1973-81	1978-86	1983-91	1988-96	1993-01	1998-06	2003-11	2008-16
SEK I	1958-66	1964-71	1969-76	1974-81	1979-86	1984-91	1989-96	1994-01	1999-06	2004-11
VS	1954-63	1960-67	1965-72	1970-77	1975-82	1980-87	1985-92	1990-97	1995-02	2000-07
Jahre in Bildung	1954-77	1960-82	1965-87	1970-92	1975-97	1980-02	1985-07	1990-12	1995-17*	2000-22*
Geburtsjahr	1948-53	1954-58	1959-63	1964-68	1969-73	1974-78	1979-83	1984-88	1989-93	1994-98
Alter PIAAC	60-65	55-59	50-54	45-49	40-44	35-39	30-34	25-29	20-24	16-19
Reformwellen	a. 60-65y. PIAAC			Erste Reformwelle			Zweite Reformwelle			

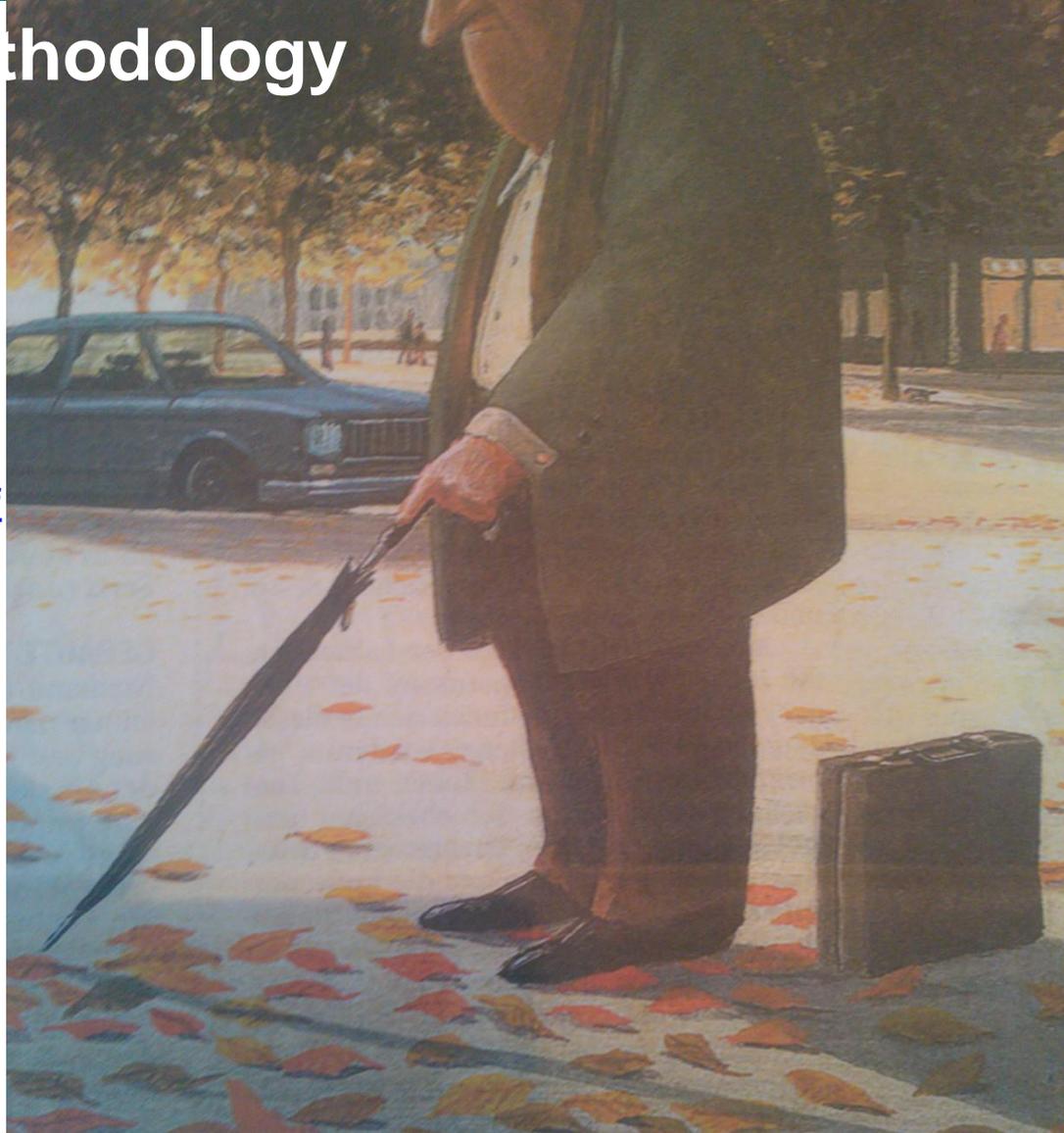
- projection to the calendar time shows the complex timing of reforms
  - a. one age group runs through different periods
  - b. one policy period covers different cohorts
- somehow ‚trivial‘, however, not adequately perceived in policy making  
*rather thinking in one-and-for-all categories...*
- population experienced two waves of reform  
*social democratic 1960er/70er, (45)50-59 cohort*  
*neoliberal since 1980s, 25-39-cohort (younger no full careers)*

# methodology

## counting...

detailed research  
report:

<http://www.equi.at/dateien/IHS-PIAAC.pdf>



Mr Klüter counts up to 4000 leaves per hour, provided it remains windless...

*Herr Klüter zählt bis zu 4000 Blätter in der Stunde,  
vorausgesetzt, es bleibt windstill.*

# methodology

- The methodology includes the following steps:
  - (1) relating age structure of the population to flow through education
  - (2) analysis of structural traits: 'tracking' in selected systems
    - Finland, Sweden, Denmark // U.K., Canada, US // Netherlands, Germany, Austria
  - (3) cross-sectional analysis: structural patterns & obs.competences
    - mean and/or median; 95/5 and 75/25-percentil-ratios;
  - (4) analysis of the timeline of reforms
  - (5) exploring age specific patterns of competenc(i)es & reforms
    - level and distribution
- so far mainly at the level of descriptive cross-tabulations or trend-analyses
  - will be further developed through modeling and confirmatory approaches

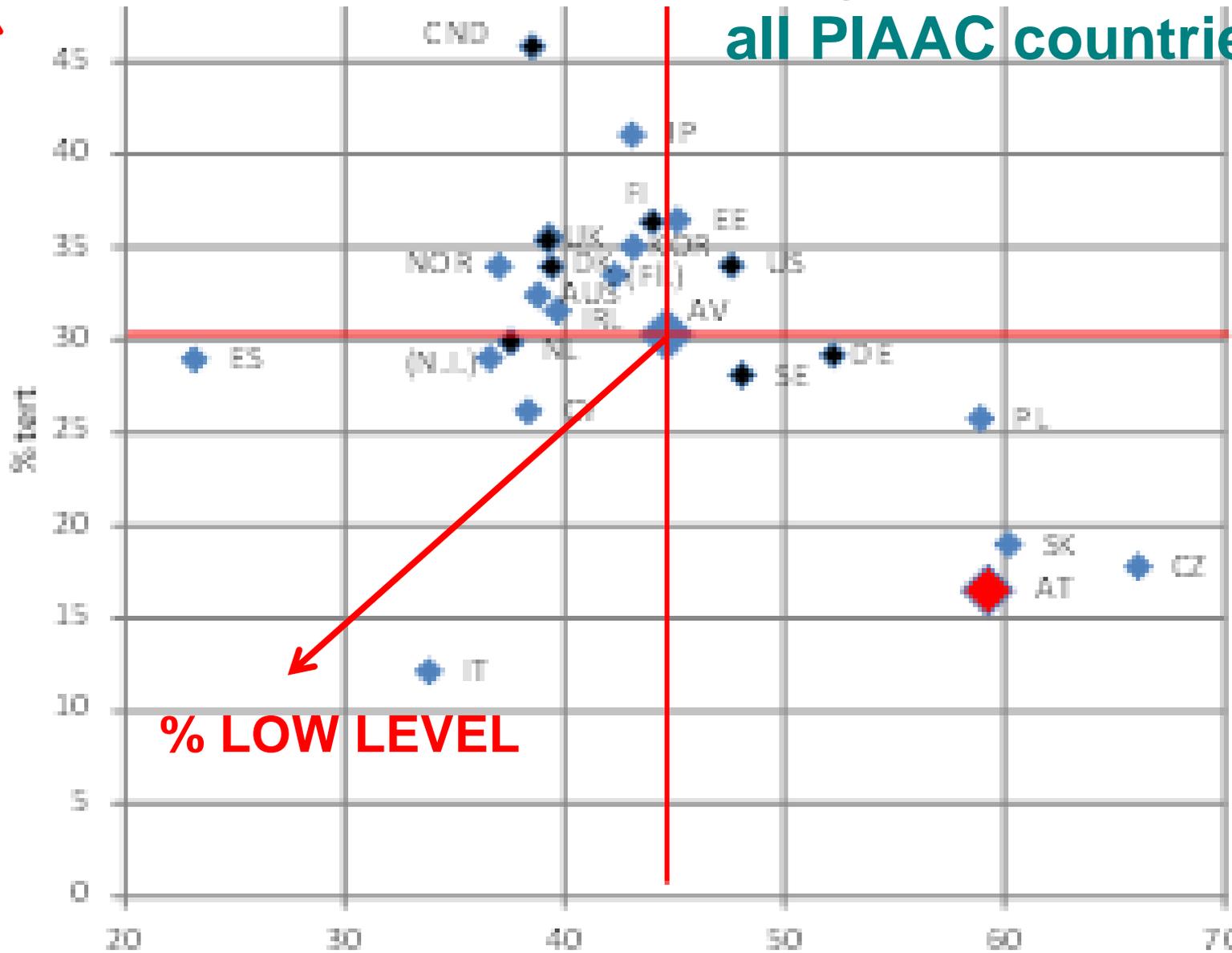
# results

- **already shown:** uncovering of patterns, of how education reforms translate into the competency/e/ or skills formation process of the population
  - time dependent and complicated pattern of 'translation process'
- exceptional/unique structure of Austrian education
- PISA indicators about differentiation at level of individual schools are misleading, because they do not catch the differentiation between schools
  - a classification that takes into account both forms shows, that - against expectations - the differentiated vocational systems are not correlated with a greater degree of inequalities of the competences in the population
- analysis of the reform policies shows only for Finland a very consequent long term reform process that is correlated to the competence profiles; the US on the other extreme do not show any positive results related to their reform policies since the 1980s.

# exceptional/unique structure of Austrian education

**% TERTIARY**

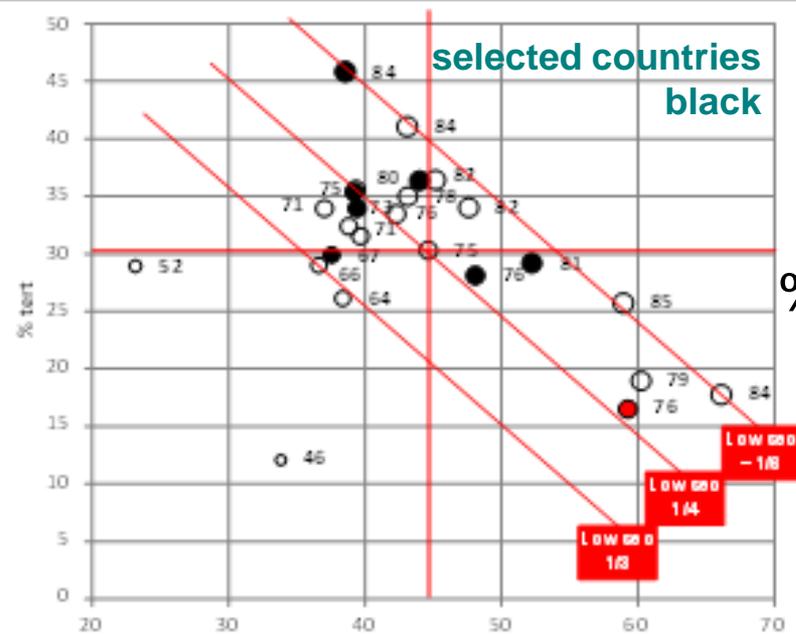
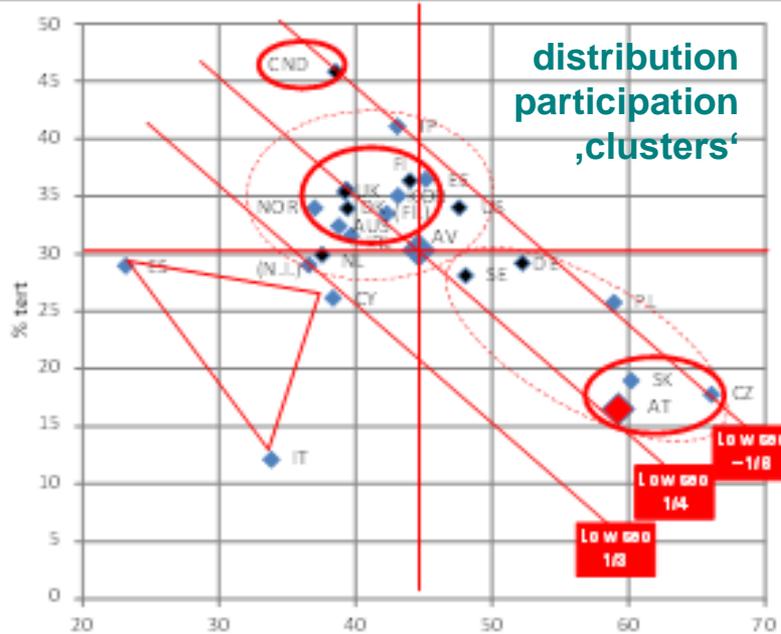
**structure tertiary und secondary  
all PIAAC countries**



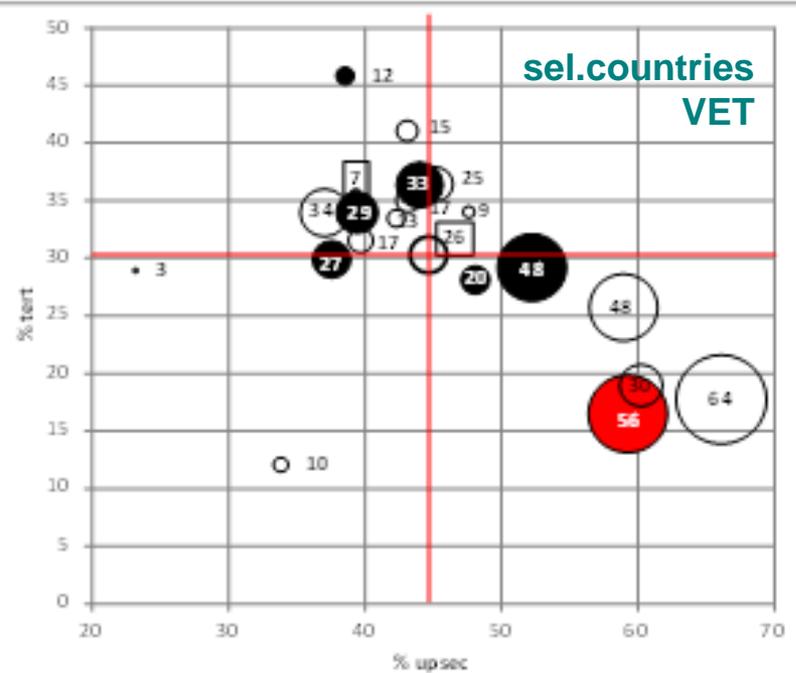
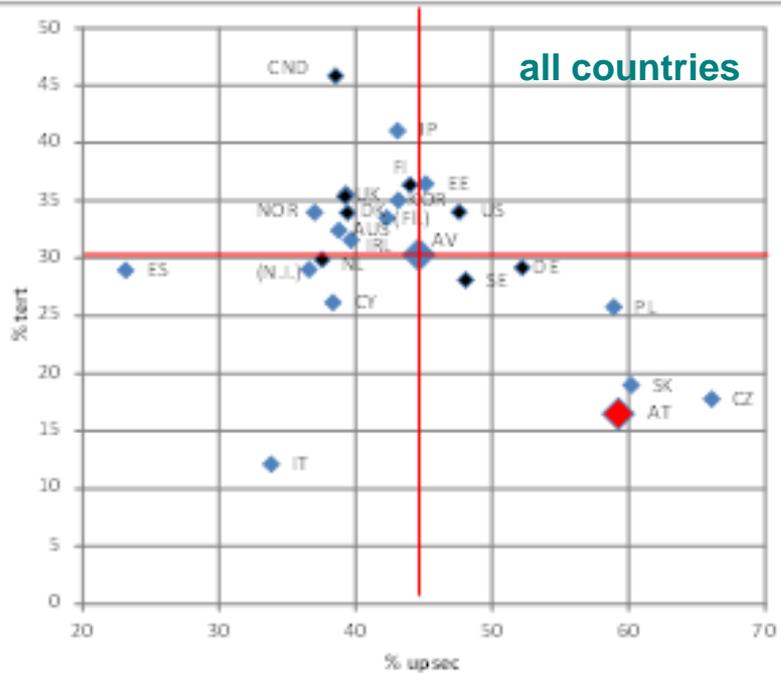
**% LOW LEVEL**

**% SECONDARY**

# structures: Austria exceptional



3 DIM  
%tert  
%upsec



%beruf

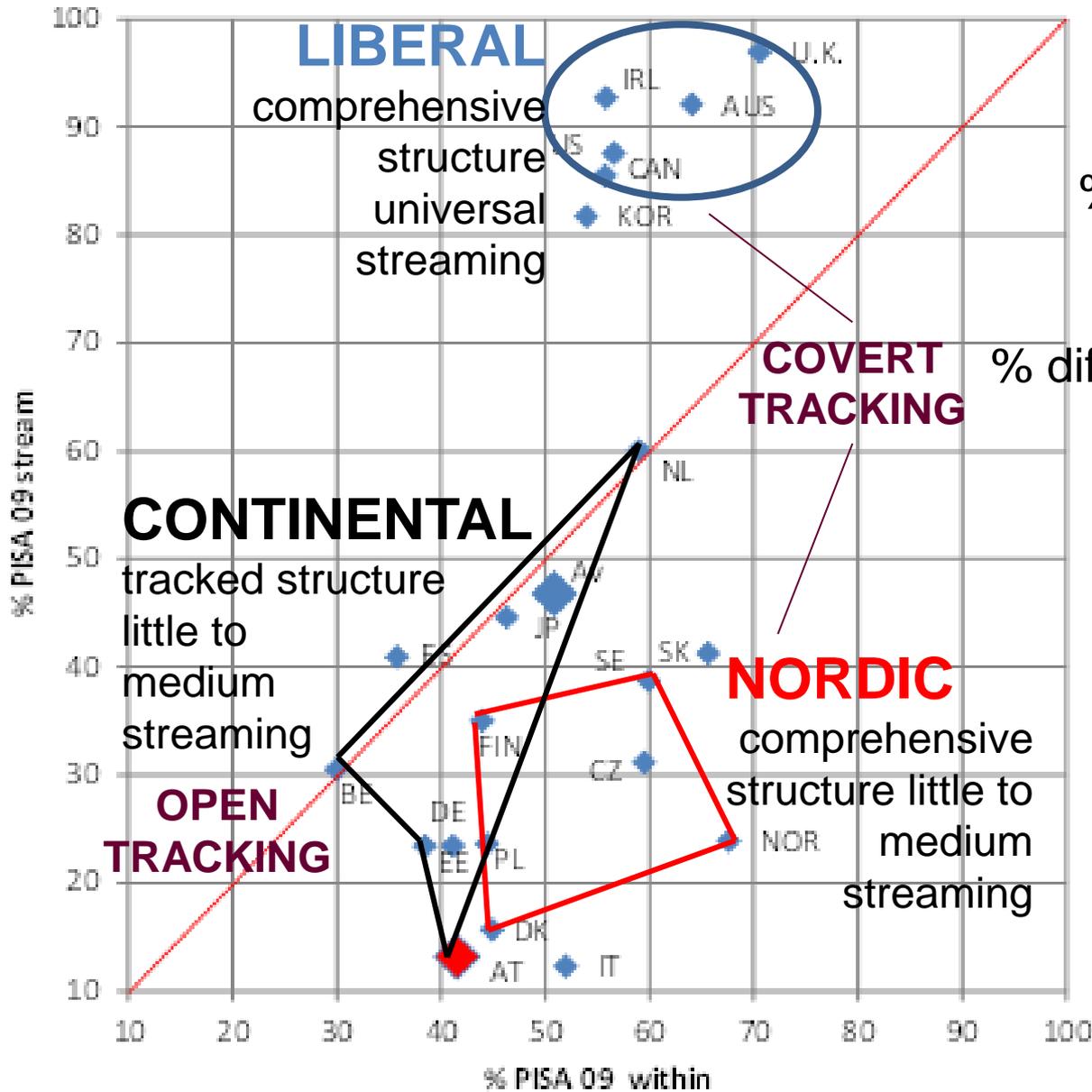
# cross-sectional (cumulative) structures: ,tracking‘ and PIAAC competences

# cross-sectional (cumulative) structures: ,tracking' and PIAAC competences

- 1 classification of tracking structures based on information from PISA (2009, 12) about differentiation within schools (,covert' tracking):
  - amount of streaming (diff within schools)
  - amount of setting (diff. within class)
- 2 tracking of different school types, not covered by PISA-variables (,open' tracking)
  - > these countries display low level of tracking at PISA variables
- question: how related to competency/e levels and distribution?

# a. classification

# ,tracking'-structures acc. PISA (principals answ.)



- vertical: % stream within schools

- horizontal: % differentiation within class

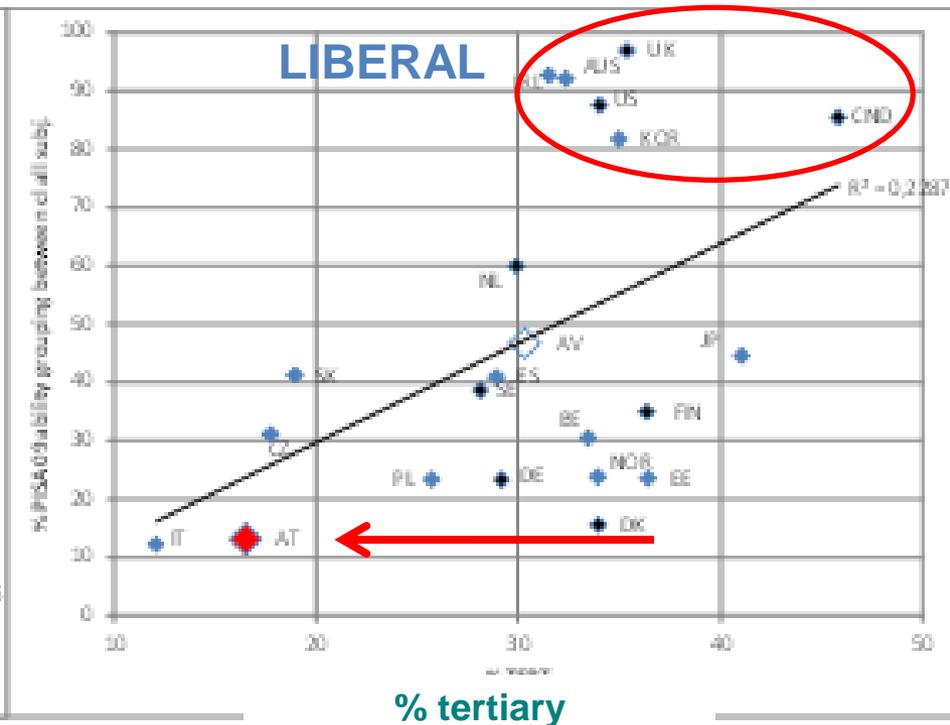
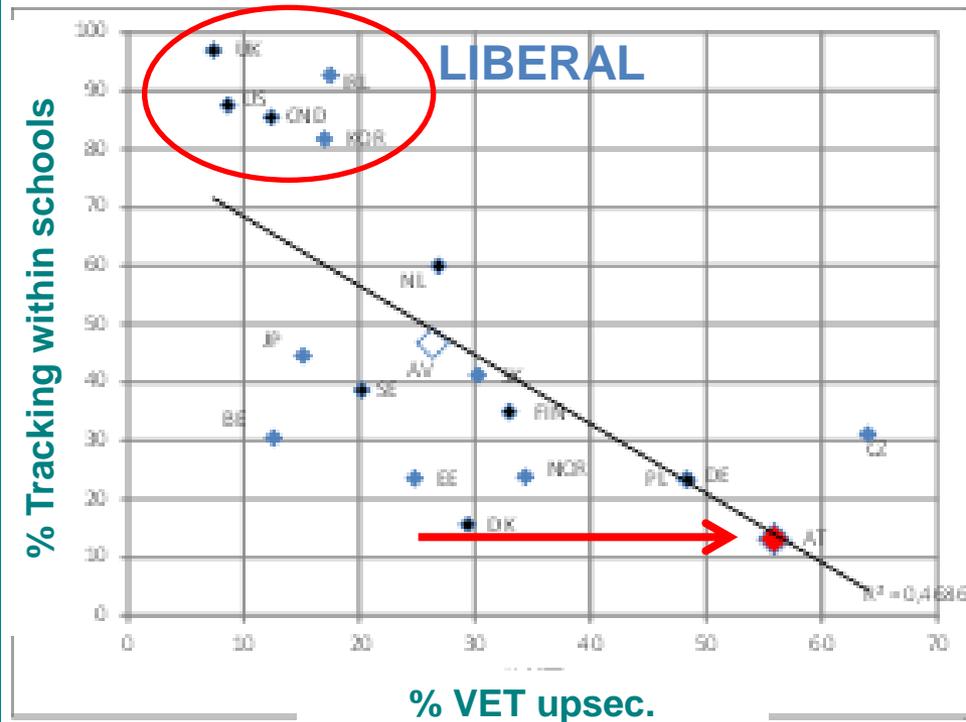
- ,tracking' in comprehensive structures within school... (**COVERT**)

- ...in differentiated structures between different school types (**OPEN**)

not visible in PISA variables

# ...,covert' tracking related to tertiarisation and vocationalism...

- ...in countries with high level of ,covert' tracking
  - VET participation is low
  - tertiary participation is high
- ...Austria reverse



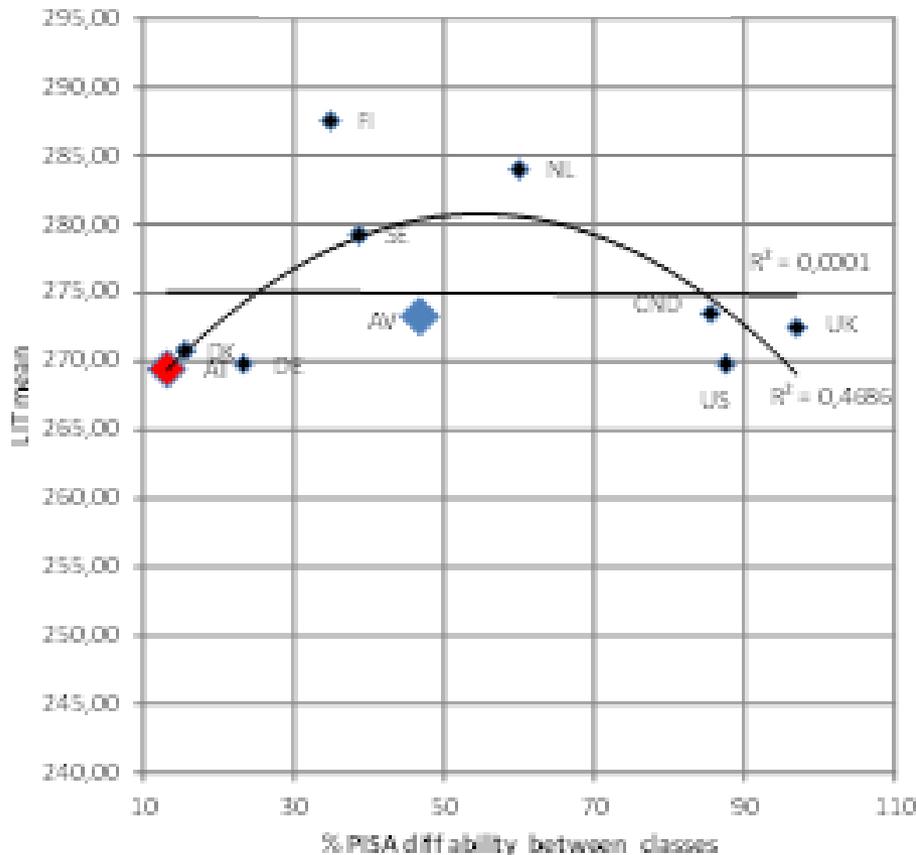
## b. tracking and competency/ levels and distribution

- ...both classifications of tracking (‘covert’ and ‘open’) compared...
- ...to competency/e indicators
  - level: test scores
  - distribution: 95/5 percentile
- ...complex relationships between educational structure and competenc(i)es...

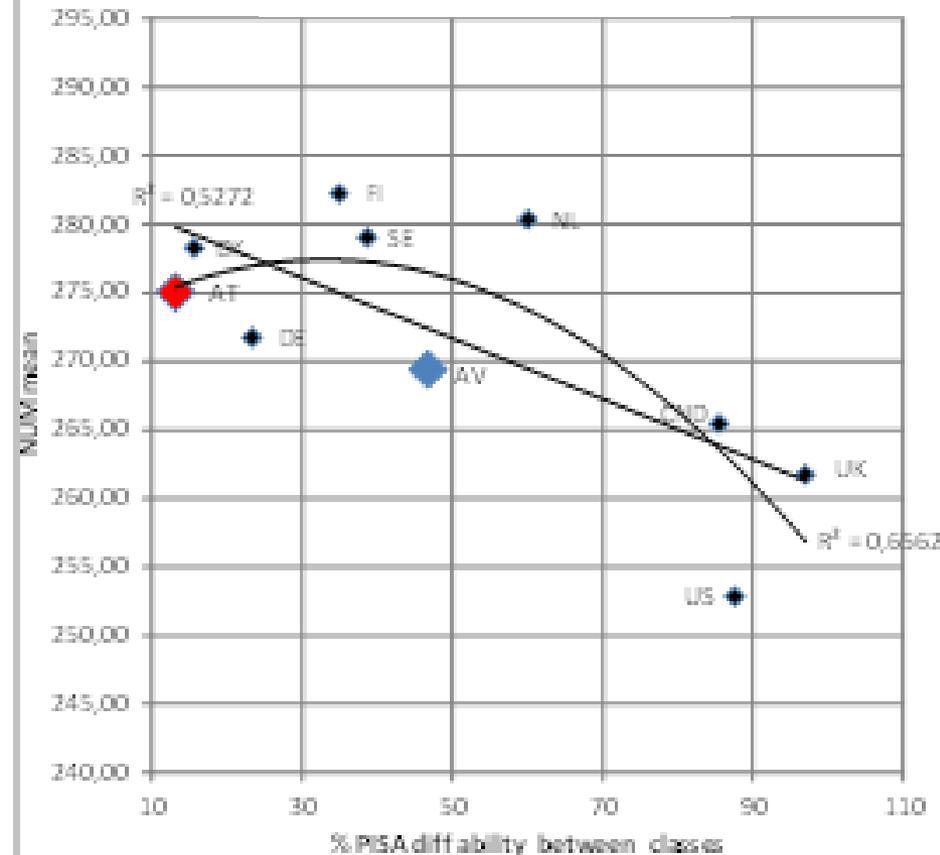
# structure & competency/e LEVEL y-axis

## x-axis-variable: tracking

LITERACY mean



NUMERACY mean

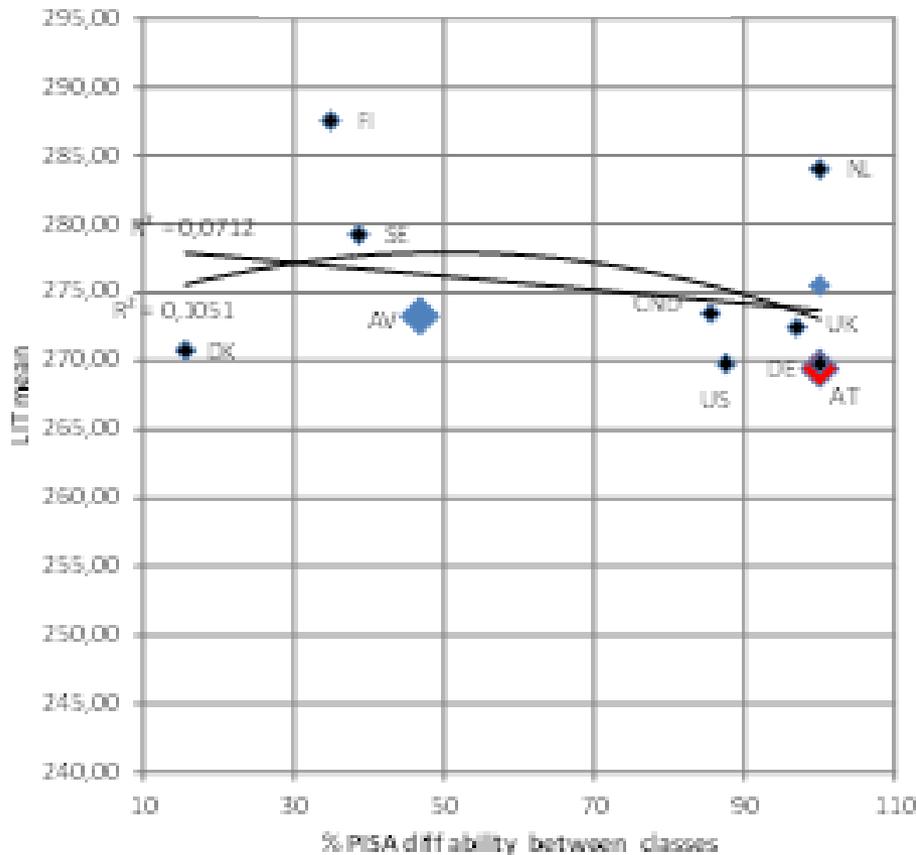


- tracking only within schools (PISA): **only ,COVERT‘ tracking**
- reading no linear relationship (medium tracking, higher score > .4); numeracy negative (more ,covert‘ tracking, lower score > .5 to .7)

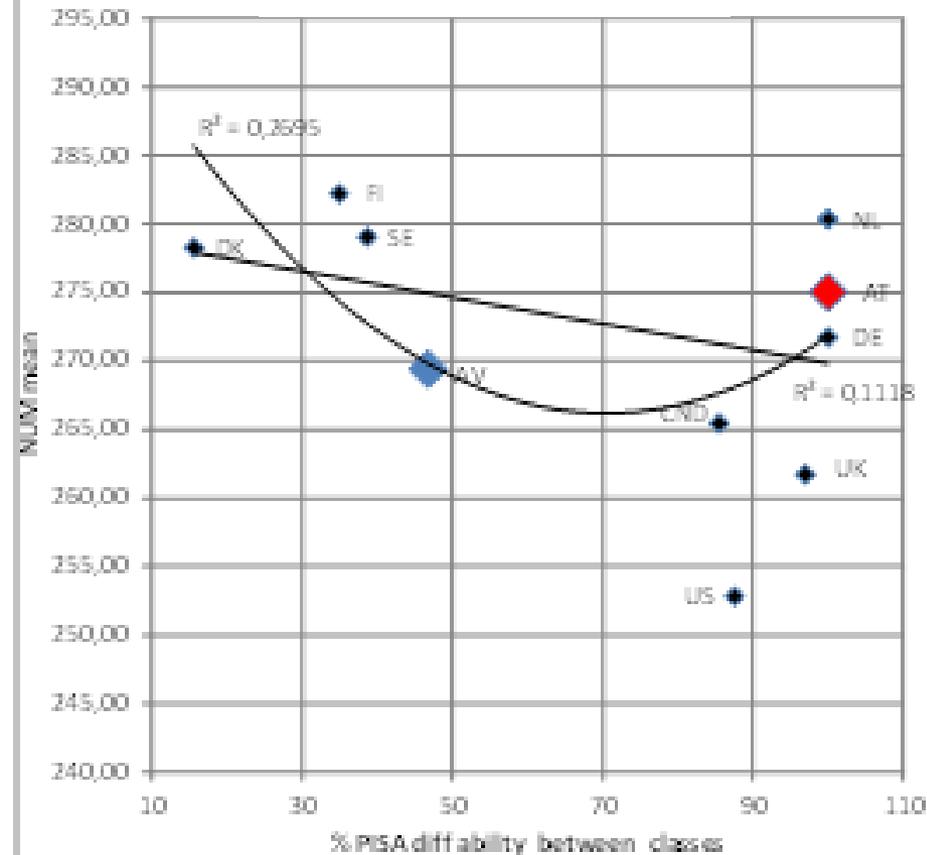
# structure & competency/eLEVEL y-axis

## x-axis-variable: tracking

LITERACY mean



NUMERACY mean

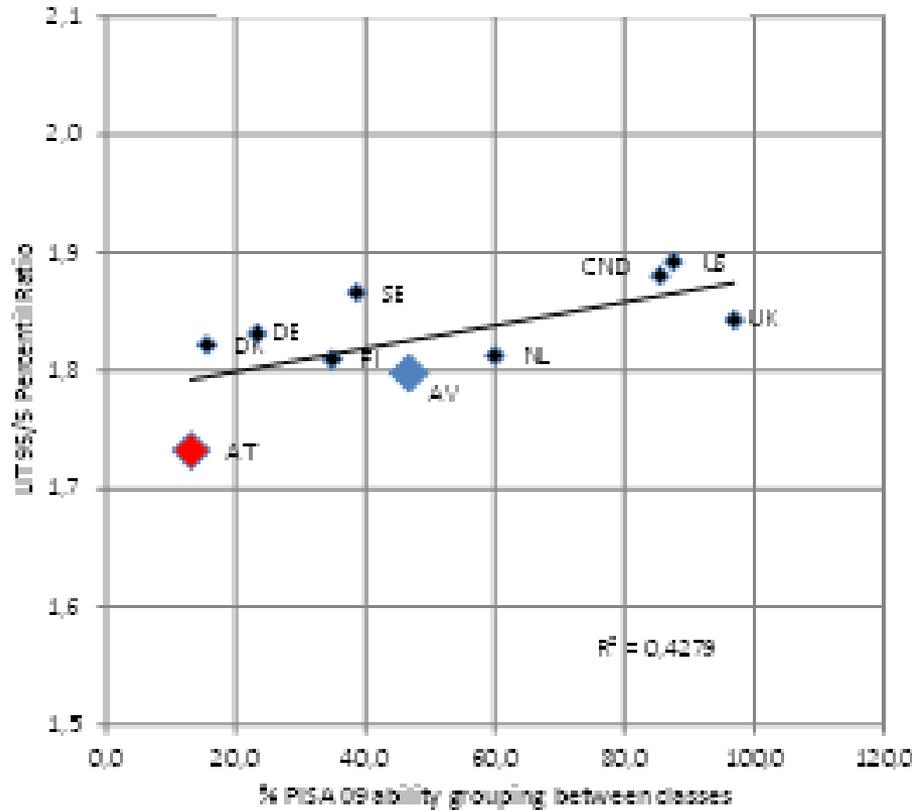


- **combined tracking PISA and institutional (,covert' and ,open')**
- reading: less relationship, not more 0 to .1
- numeracy: also less relationship .1 to .3 > both against expectation

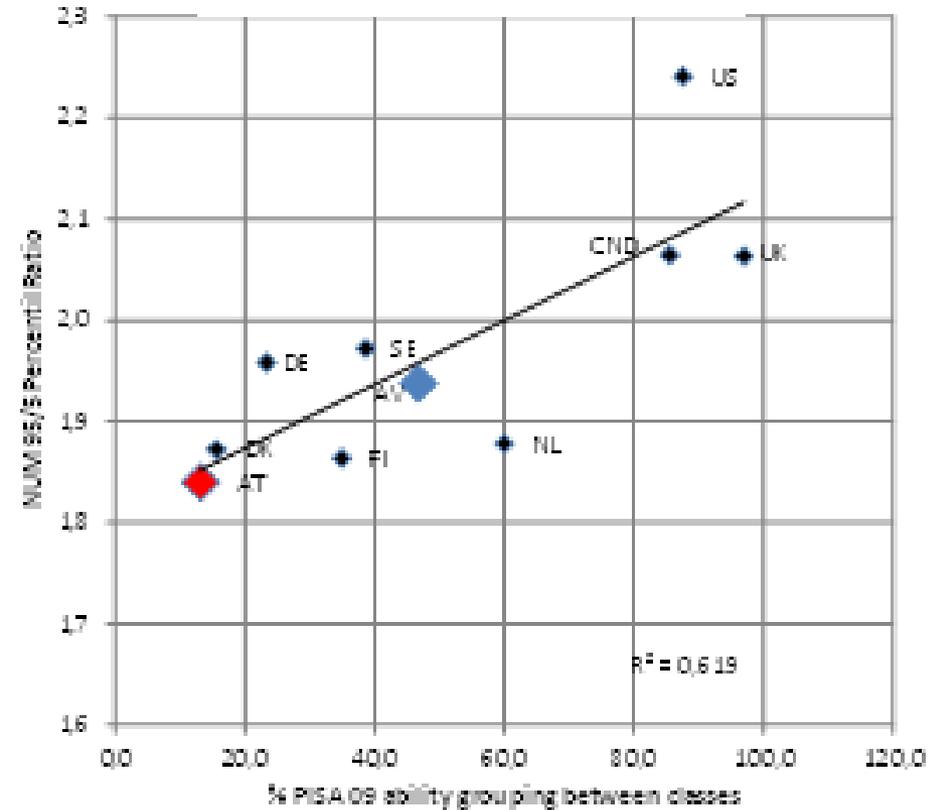
# structure & competency/e **INEQUALITY** y-axis

## x-axis-variable: tracking

LITERACY 95/5 Perzentil



NUMERACY 95/5 Perzentil

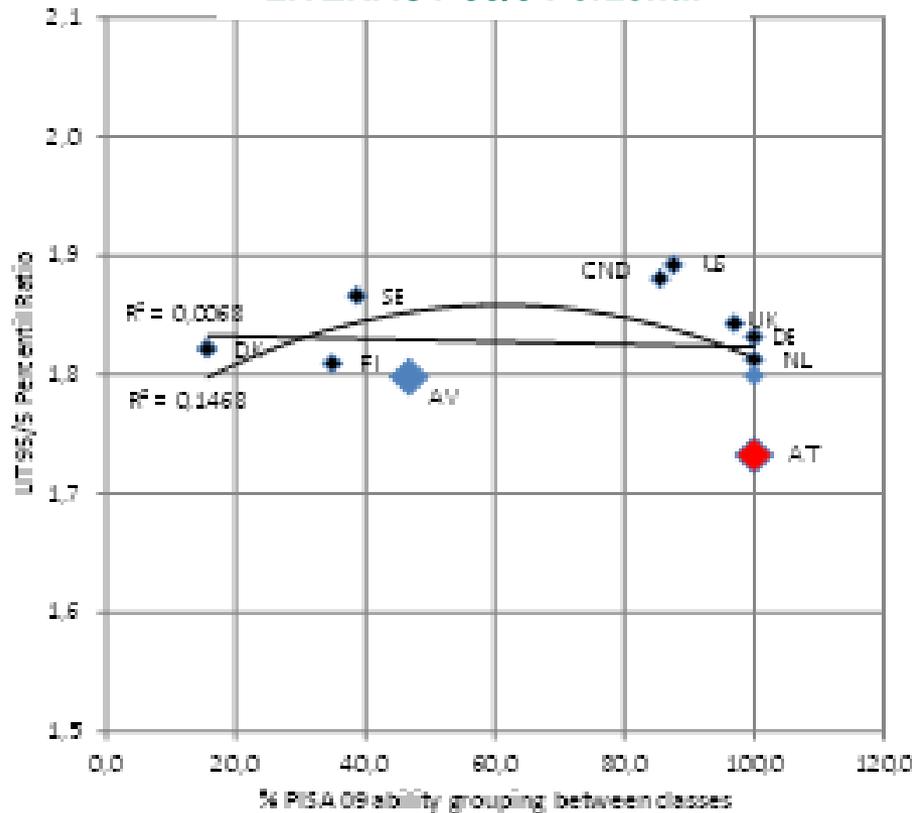


- tracking only within schools (PISA): **only ,COVERT‘ tracking**
- reading slight and numeracy stronger positive relationship .4 to .6

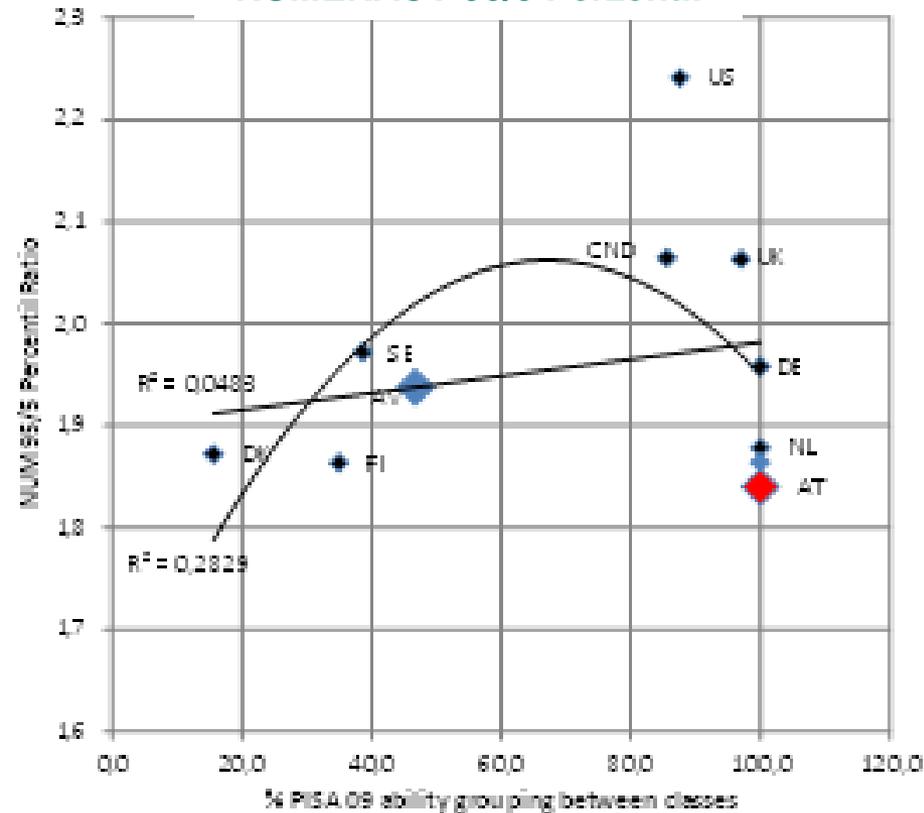
# structure & competency/ INEQUALITY y-axis

## x-axis-variable: tracking

LITERACY 95/5 Percentil



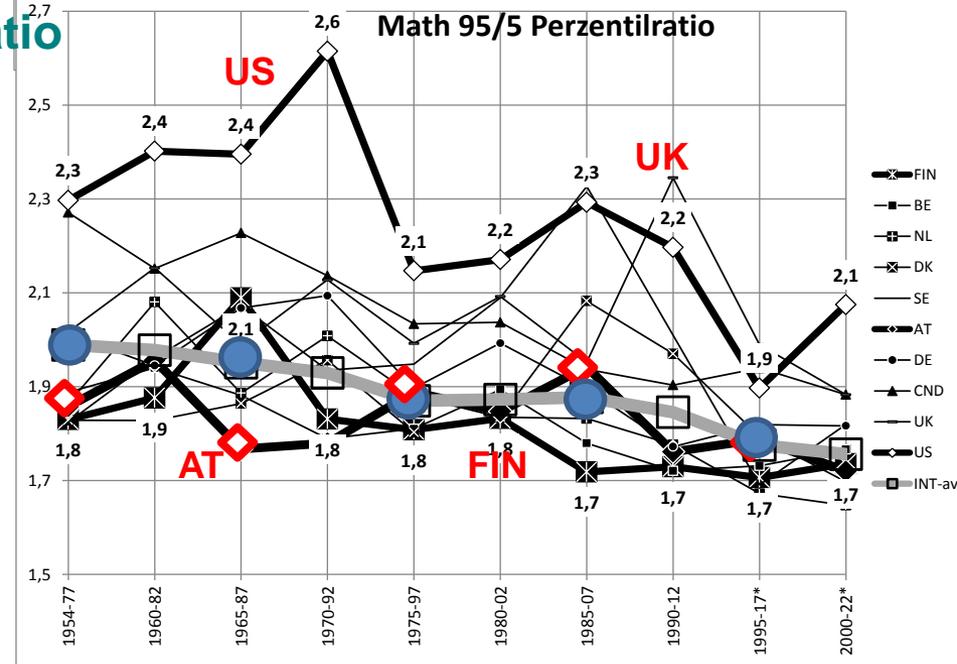
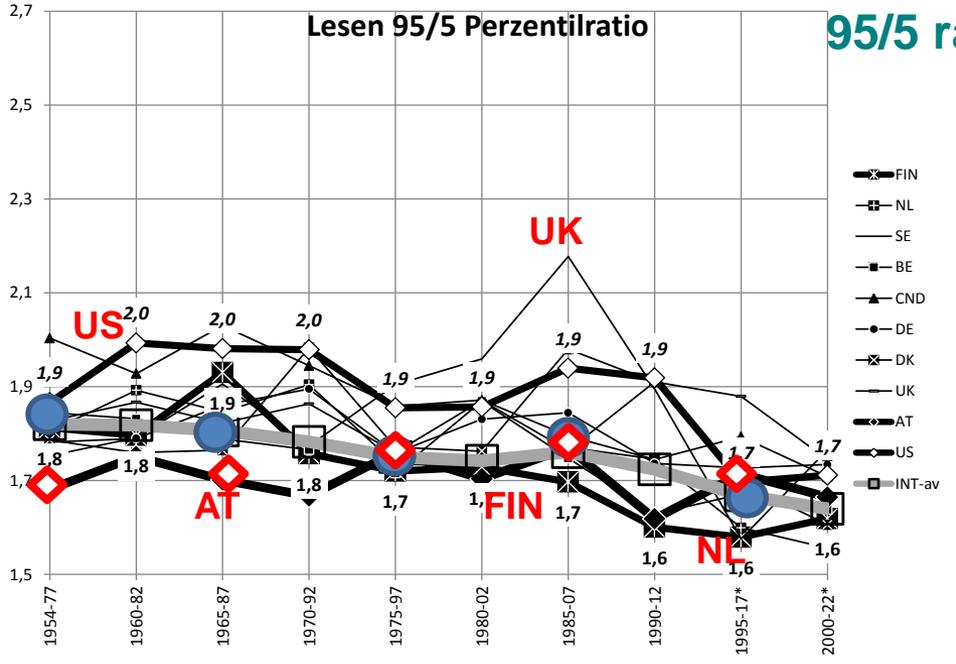
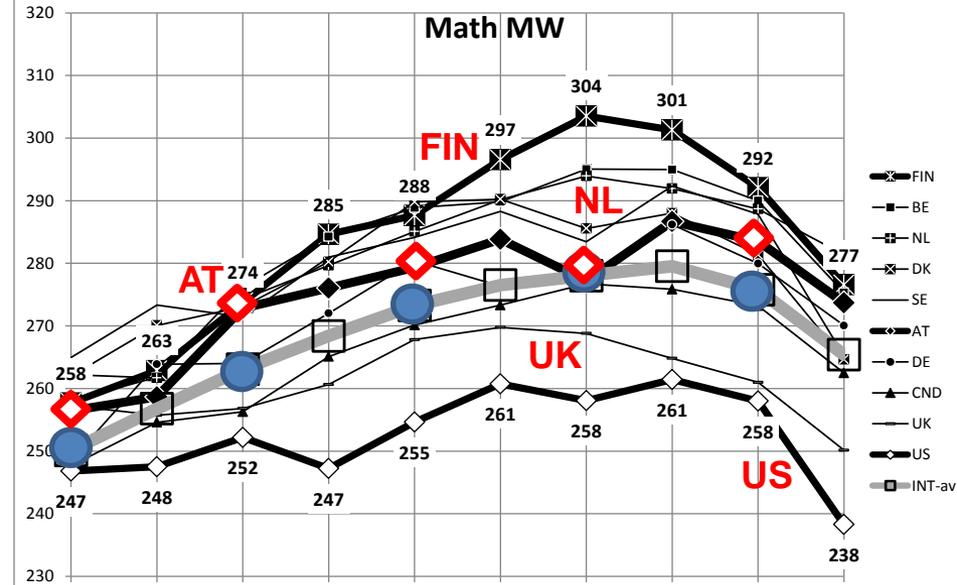
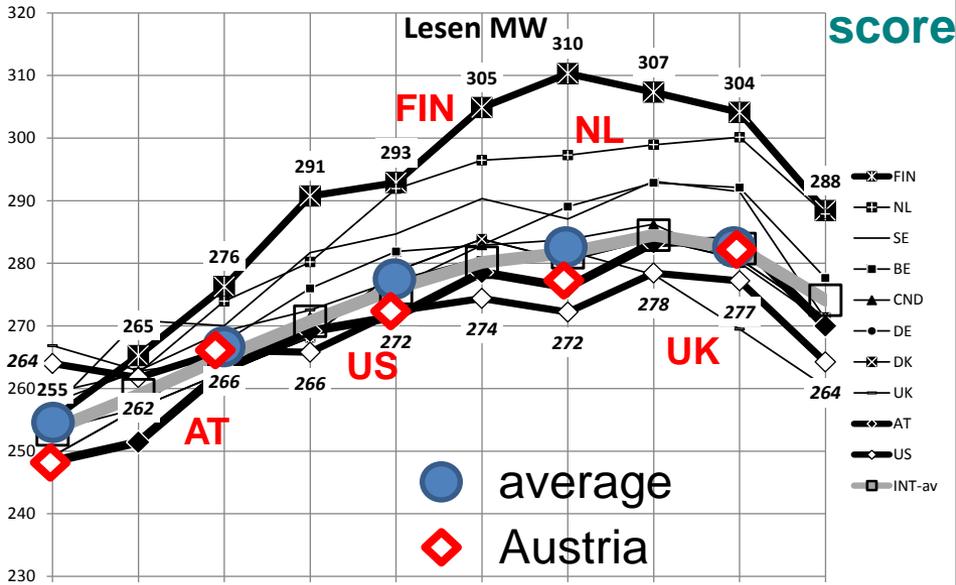
NUMERACY 95/5 Percentil



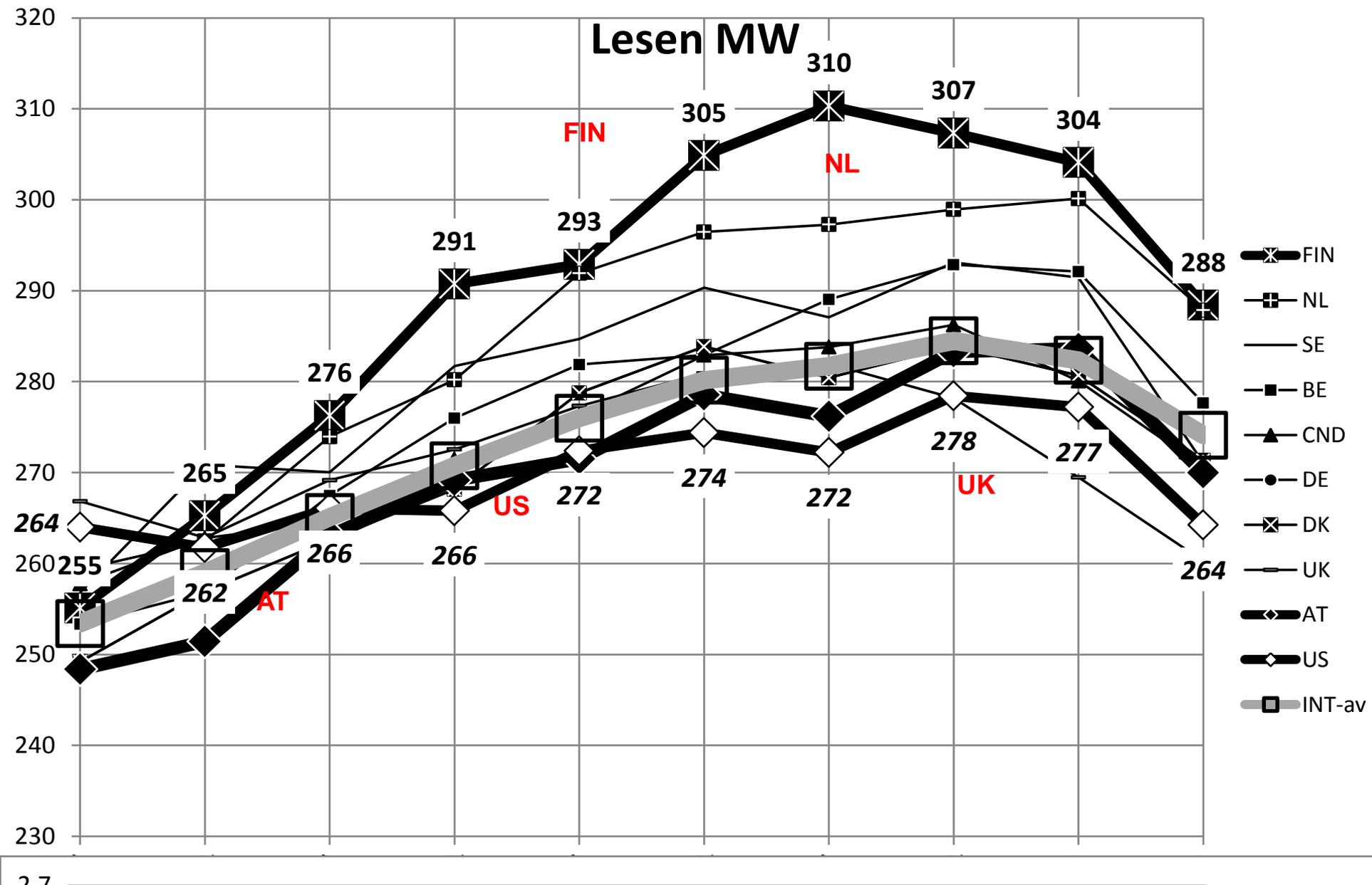
- **combined tracking PISA and institutional (,covert‘ and ,open‘)**
- reading (0 to .1) and numeracy (0 to .2) weakening of relationship
- **OVERALL: no support for widely held expectation that openly tracked systems increase inequality of competenc(i)es (and scores)**

# reform history and competenc(i)es

# Competency/e level & inequality sel.countries

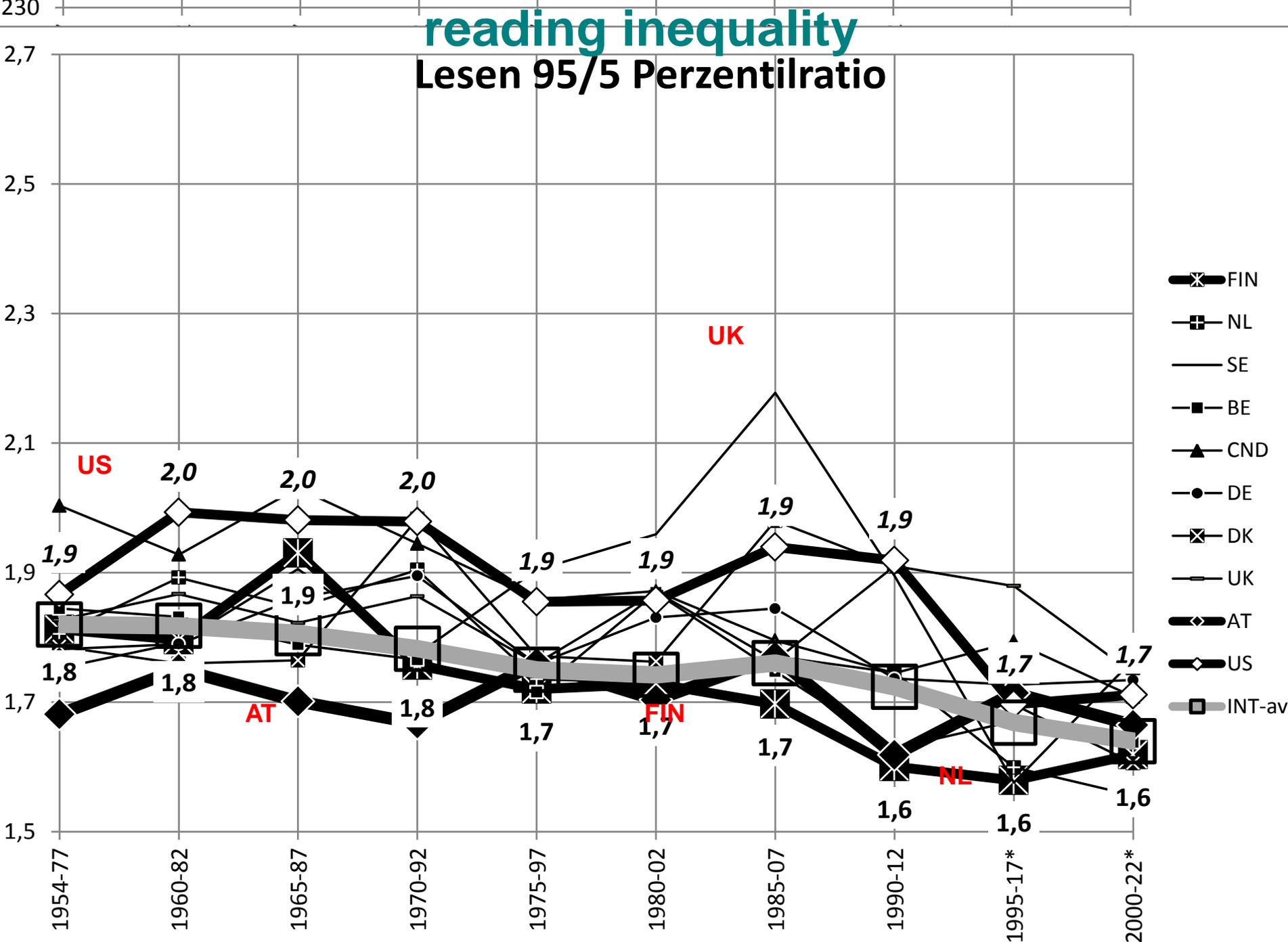


# reading score



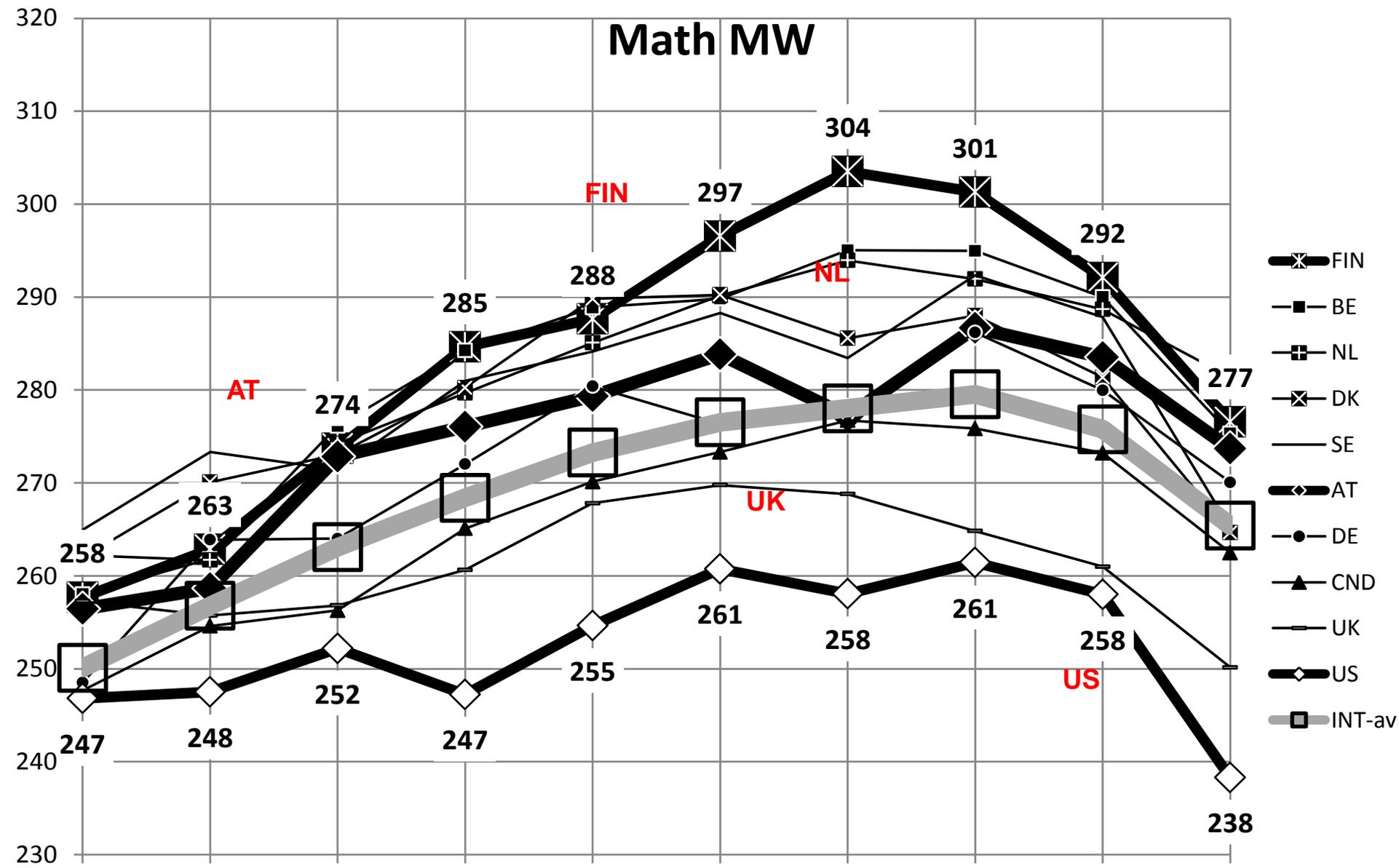
# reading inequality

## Lesen 95/5 Perzentilratio

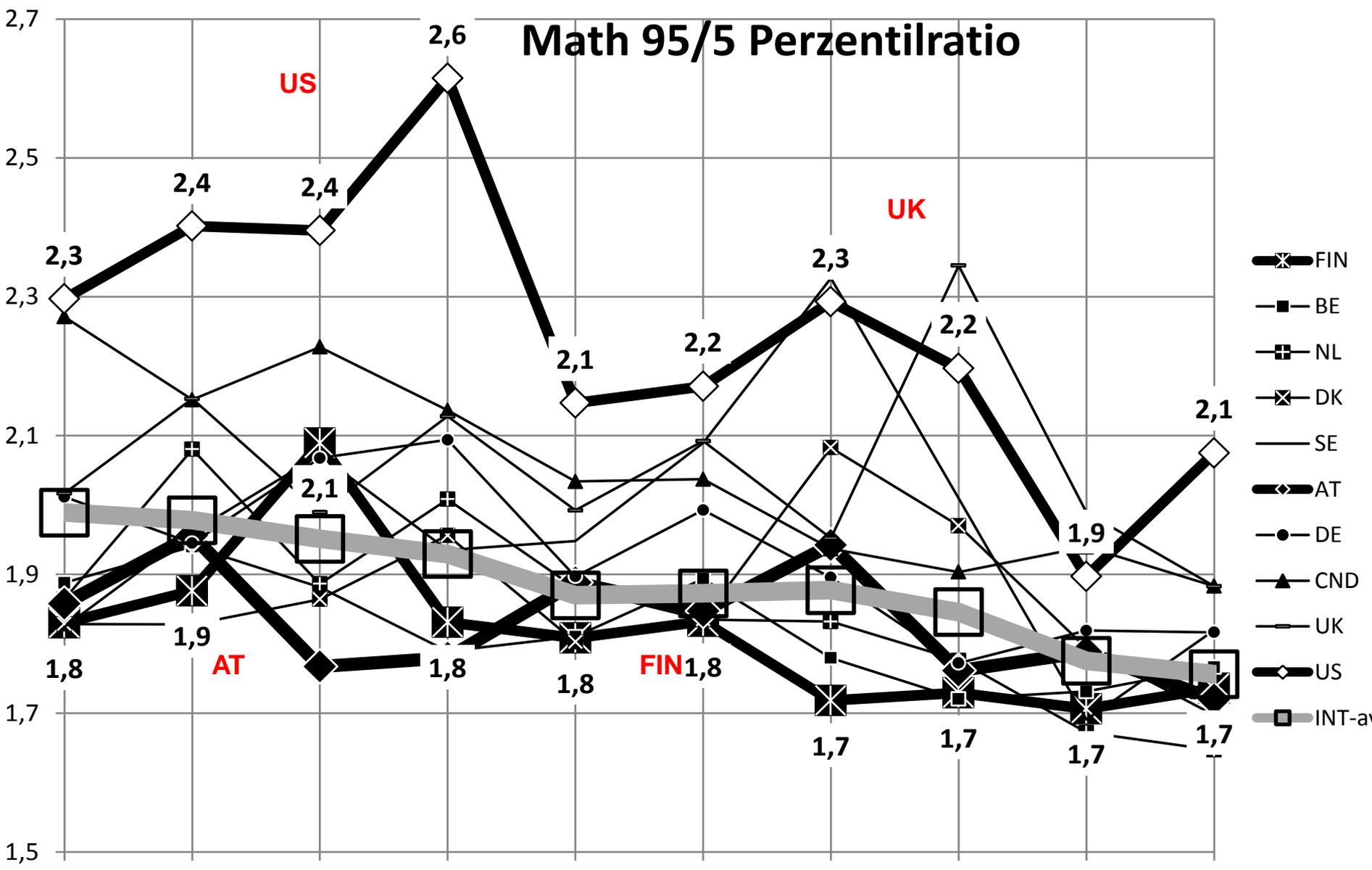


# numeracy score

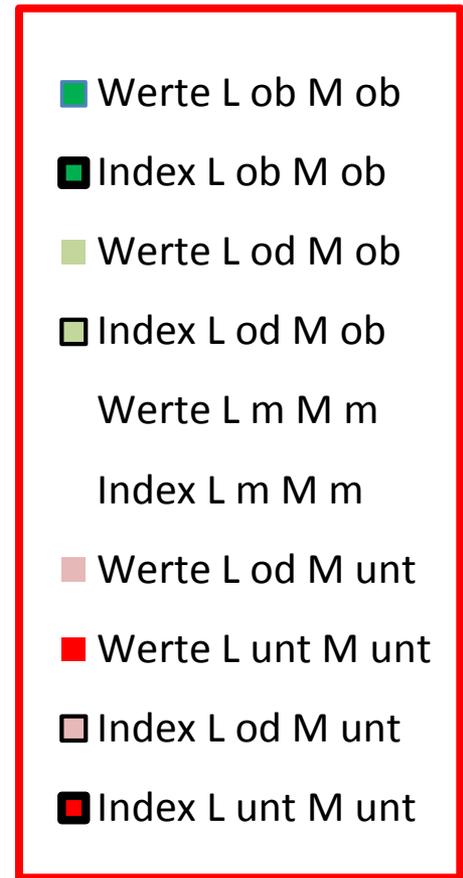
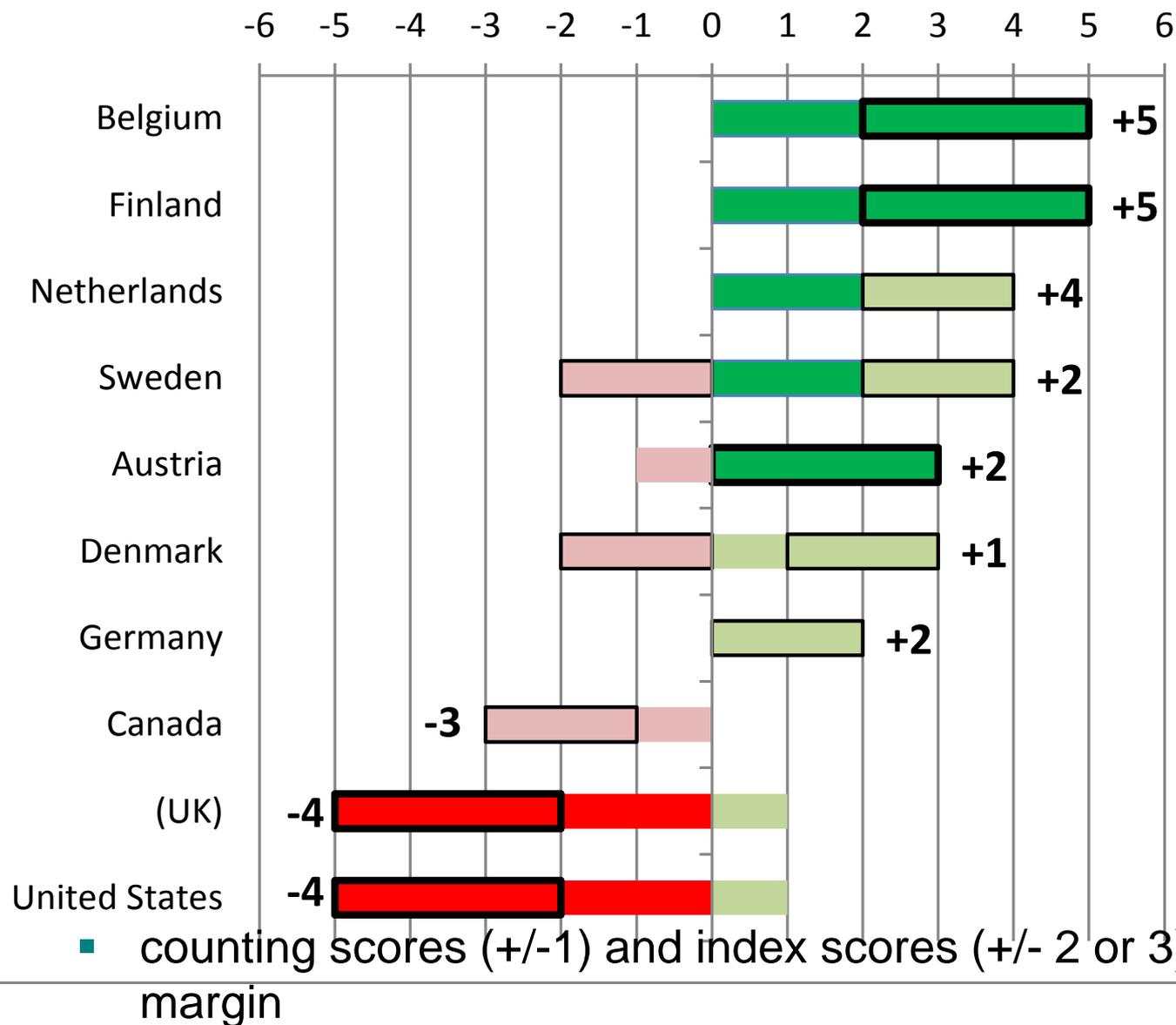
## Math MW



## Math 95/5 Perzentilratio



# attempt of ,ranking' sel.countries



# verbal interpretation (German + Engl.summary)

Hohe Werte und positive Entwicklung  
(Finnland, Belgien, Niederlande)

Gemischt mittlere Werte und Entwicklung  
(Schweden, Österreich, Deutschland,  
Dänemark)

Niedrige Werte und ungünstige  
Entwicklung ( Vereinigtes Königreich  
(England, Nordirland) , USA,  
Kanada)

## scores

- In I  
auf b  
Ungle  
- in F  
die et  
reduz

### ENGL.SUMMARY:

- FIN, BE, NL positive
- SE, AT, DE, DK medium
- UK, US, CAN unsatisfactory

eiden  
ngert,

gleich  
eiden  
eit mit

Hohe Werte und positive Entwicklung  
(**Finnland, Belgien, Niederlande**)

Gemischt mittlere Werte und Entwicklung  
(**Schweden, Österreich, Deutschland, Dänemark**)

Niedrige Werte und ungünstige Entwicklung (**Vereinigtes Königreich (England, Nordirland)** , **USA, Kanada**)

## KOMPETENZVERTEILUNG

# inequality

- In **Belgien** und den **Niederlanden** ist auf beiden Indikatoren eine geringe Ungleichheit weiter reduziert worden.  
- in **Finnland** ist bei beiden Indikatoren die eher geringe Ungleichheit leicht reduziert worden

### ENGL.SUMMARY:

- BE, NL, FIN small inequality further reduced
- DK, SE, AT, DE complex picture
- US, CAN high inequality reduced, but still high  
UK high not reduced

- in **Dänemark** ist bei der Quartilsratio die eher geringe Ungleichheit leicht reduziert worden, bei der 95/5 Percentilratio gibt es sehr starke Schwankungen nach oben und nach unten bei geringer Gesamtveränderung im Trend  
- **Schweden** liegt bei der Quartilsratio ohne größere Veränderung im Mittelfeld, zeigt bei 95/5 Percentilratio sehr starke Schwankungen nach oben und nach unten bei geringer Gesamtveränderung im Trend  
- in **Österreich** ist die Ungleichheit auf beiden Indikatoren eher gering, hat sich aber nicht reduziert

- **Deutschland** hat bei der Quartilsratio eine hohe Ungleichheit mit sehr geringer Veränderung, bei der 95/5 Percentilratio eine eher geringe Ungleichheit, die sich in mittlerem Maß reduziert

- **USA** und **Kanada** haben auf beiden Indikatoren die Ungleichheit verringert, sie bleibt aber hoch  
- Das **Vereinigte Königreich (England, Nordirland)** hat bei beiden Indikatoren eine hohe Ungleichheit mit sehr geringer Veränderung

# summary

- Austria exceptional structure, high tracking, high upper secondary education and high VET
- comprehensive structures include ,covert‘ tracking, there seems to be a relationship between tertiary education and tertiary education, and of VET with ,open‘ tracking
- selected countries: Finland exceptionally positiv, Nordic countries different; ,liberal‘ countries negativ, ,continental‘ countries also different (NL, BE good; DE, AT mixed, medium)
- marked ,openly‘ differentiated systems as well as VET provide similar scores and inequality as low differentiated comprehensive systems (unfavourable: ,covertly‘ differentiated comprehensive systems

# Material

- [www.equi.at/dateien/IHS-PIAAC.pdf](http://www.equi.at/dateien/IHS-PIAAC.pdf)

