

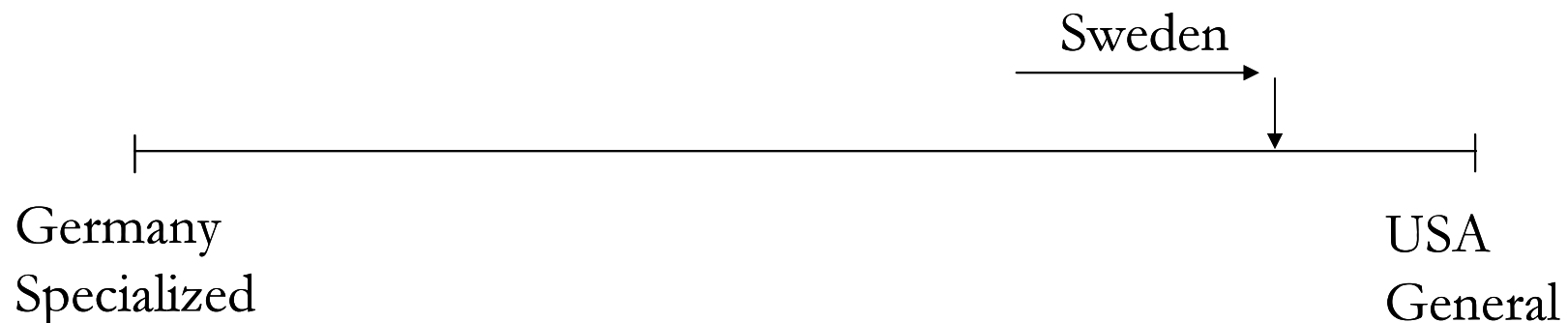
Is US-style secondary education for everyone?

Distributional consequences of two reforms to upper-secondary education in Sweden during the 1990s

Peter Fredriksson

Introduction

- A couple reforms during the 1990s have moved Swedish upper-secondary toward US-style high-school education
- Most importantly a reform in 1991 introduced programs where
 - The difference between vocational tracks and university-preparatory tracks decreased
 - The length of the vocational tracks was increased by 1 year (2→3)
 - The theoretical content of the vocational tracks was increased (weaker link to the labor market, eligible for university ed.)
 - Greater flexibility in terms of choosing courses within a program



Introduction

- The reform thus emphasized general skills.
 - Idea: general skills provide better insurance in the labor market
 - Reduce social stratification in higher ed. -- “Keep all doors open”
 - Explicit aim: increase transitions from vocational to university education
- Is more (general) education good for everyone?
 - To address this question, I will present some evidence from an evaluation of a pilot that preceded the reform (Hall 2009, IFAU WP 2009:9)
- Keep in mind that Sweden has extensive adult 2nd chance education
 - The virtue of 2nd chance education depends on specialization
 - The dangers of specialization mitigated by 2nd chance education

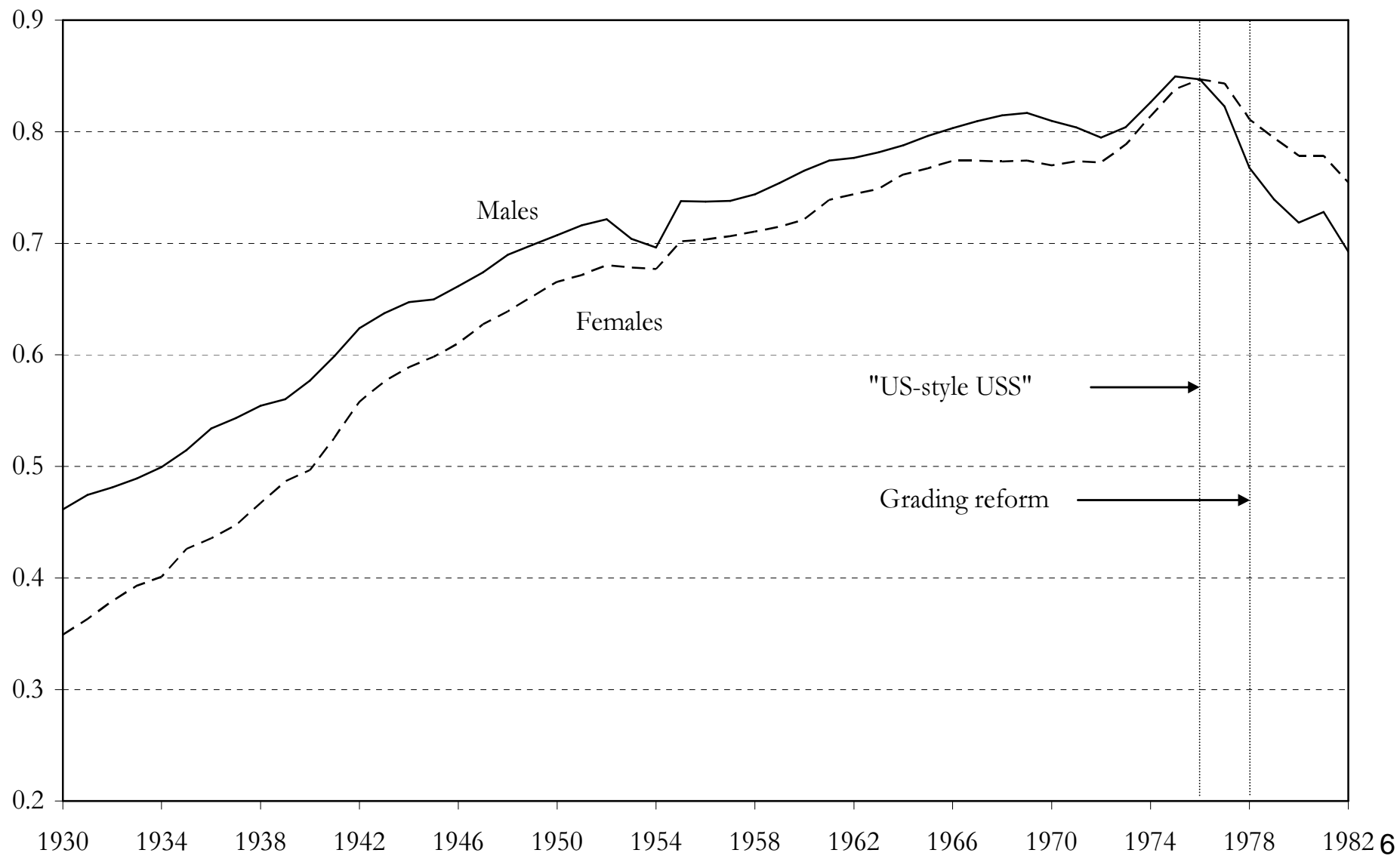
Other changes during the 90's in USS (Intro. ctd.)

- Share not getting a degree increased very much in late 90s
 - A grade-setting reform where **Fail** is actually given.
 - Prior to the grading reform, low-achievers got a low grade (but still obtained a degree, given that they attended class)
 - The reform moved the system from a norm-based to a criterion-based grading system
- How does the grading reform affect the labor market outcomes, in particular for disadvantaged students?

Background

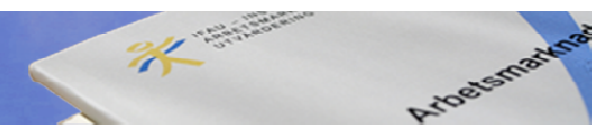
- 9 yrs. of compulsory primary and lower-secondary schooling
 - No tracking
- Specialization takes place in upper-secondary schooling (USS) (enter at age 16, 3 yrs.)
 - Vocational/University-preparatory (Academic)
 - ~30 % in vocational programs
- Higher education

USS degrees by cohort and gender (backg. ctd.)

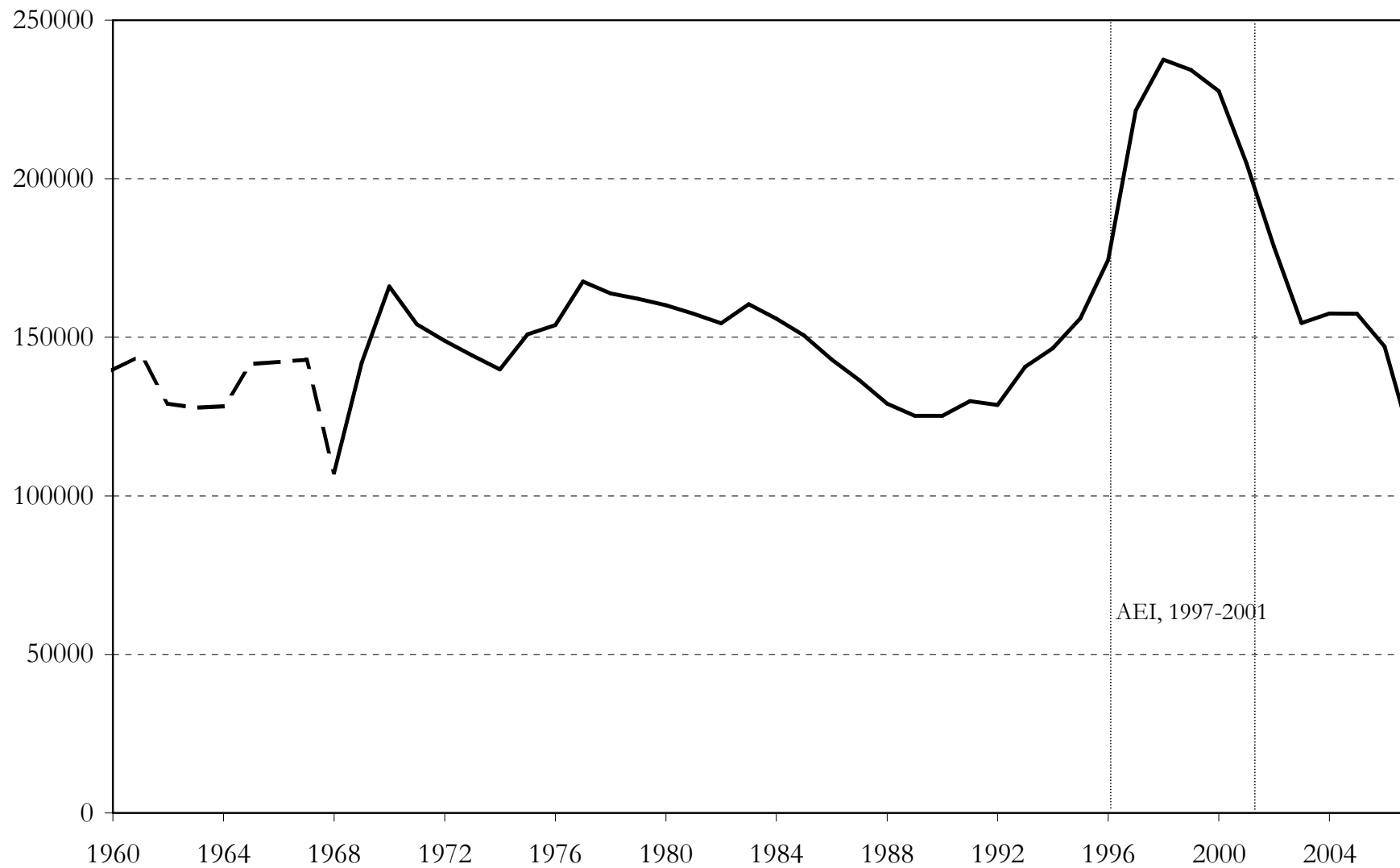


Cognitive ability at age 13 by track and cohort (backg. ctd.)

Cohort	USS degree			
	<u>Vocational</u>		<u>University preparatory</u>	
	Share of cohort	Percentile rank	Share of cohort	Percentile rank
1948	18.9	44.5	49.7	59.7
1953	18.9	43.5	52.2	59.5
1967	32.1	40.3	50.8	60.4
1972	28.6	39.1	52.8	60.4
1977	35.3	39.9	52.6	59.9
1982	27.7	43.1	47.8	59.3



Scale of adult education over time (backg. ctd.)



Thus... (summary of backg.)

- “Drop-out rates” appear to have increased following the two reforms
- Cognitive ability of vocational stud. lower than among those in “Academic” tracks (unsurprising)
- Systematically greater increase in drop-out rates among vocational students
- Adult education is and have been extensive (4-6 % of ind. aged 20-44)

Evaluation evidence – Is US-style USS for everyone?

- The 1991-reform was preceded by a pilot
 - Pilot: 3 yrs. of vocational ec. (rather than 2) greater emphasis on theoretical subjects (Maths, English, Swedish)
- The pilot was run in some municipalities
- The allocation of pilot-status was non-random
 - But an explicit goal was to include different kinds of municipalities in the pilot
- Hall (2009) essentially applies a DiDs strategy to handle non-random selection (in levels)
- Key identifying (DiDs) assumption:
 - had it not been for the pilot, outcomes would have changed as in the comparison municipalities

Data and study population

- Swedish register data containing
 - Type of track
 - Individual and family characteristics
 - Outcomes: Degree from USS, University attendance, Educational attainment, and Earnings
- Study population
 - Individuals who finished compulsory school (on time, age 16)
 - And directly enrolled in vocational 2/3-year USS
 - Over the time period 1986-90 (-86 pre-pilot; 87-90 post-pilot)
 - In practice this amounts to using cohorts born 1970-74.

- Key independent (endogenous) variable:
 - Starting a 3-year vocational program
- Key exogenous variable:
 - Intensity of 3-year vocational program generated by the pilot

Validity of DiDs assumption

- One worry is that pilot municipalities are on systematically different trends than non-pilot municipalities
- Pilot could, e.g., affect composition of vocational/academic students
- Classify municipalities in terms of whether pilot intensity is
 - high/low
 - pre/post pilot introduction

DiDs assumption seem valid

Share of population starting vocational/academic USS by cohort and pilot intensity

	Vocational			Academic		
	<u>Pilot-intensity</u>			<u>Pilot-intensity</u>		
	High	Low	Difference	High	Low	Difference
Post-pilot (1990)	0.411	0.427	-0.015	0.546	0.536	0.010
Pre-pilot (1986)	0.430	0.422	-0.012	0.517	0.513	0.004
Difference	-0.019	-0.015	-0.004 (0.009)	0.029	0.023	0.006 (0.008)

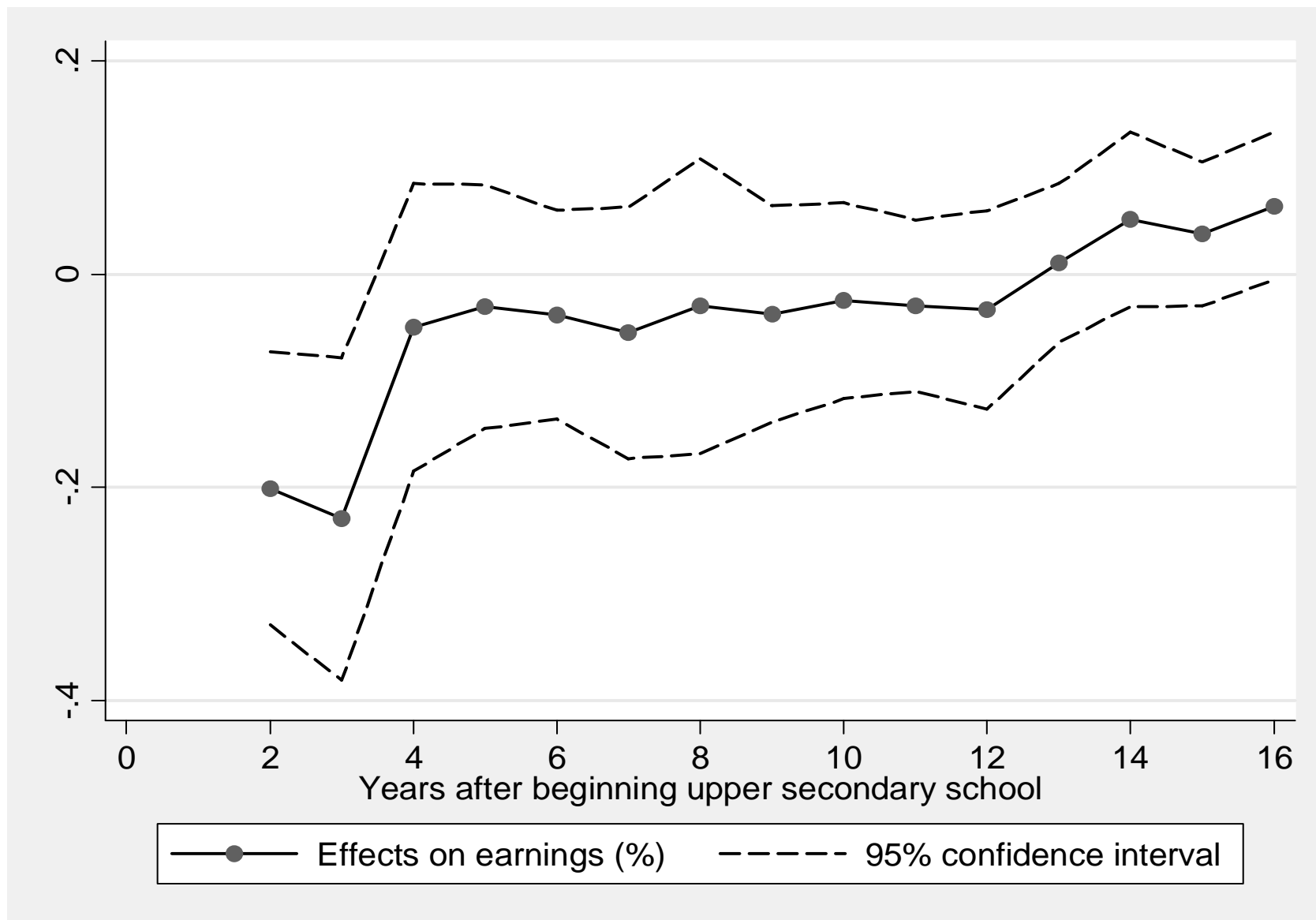
Significant trends in the data. But trends do not differ by pilot intensity

Results (IV -- 2SLS)

Effects of starting a 3-yr vocational track by compulsory school (CS) GPA

	Pr(USS degree)			Pr(university entry)		
	<u>All</u>	<u>By CS GPA</u>		<u>All</u>	<u>By CS GPA</u>	
		Below avg.	Above avg.		Below avg.	Above avg.
Starting a 3-year track	-0.038 (0.019)	-0.083 (0.023)	0.017 (0.023)	0.006 (0.016)	0.002 (0.016)	0.010 (0.030)
# individuals	184,101	101,543	82,558	184,101	101,543	82,558

Effects on earnings (IV -- 2SLS)



Summary of results

- Effects of an additional year of schooling + increasing emphasis on general (theoretical) skills
 - This reduced the Pr(degree), although only for low-achieving students
 - Had no effect on Pr(university entry)
 - Had no significant effect on long-run (LR) earnings (Some indication of positive effect -- a year of schooling which should have a return)
- There is a risk that low-achieving students are “struck-out” by a greater emphasis on academic skills
 - Consistent with US experimental evaluations of Career academies
 - There is no apparent gain for high-achievers

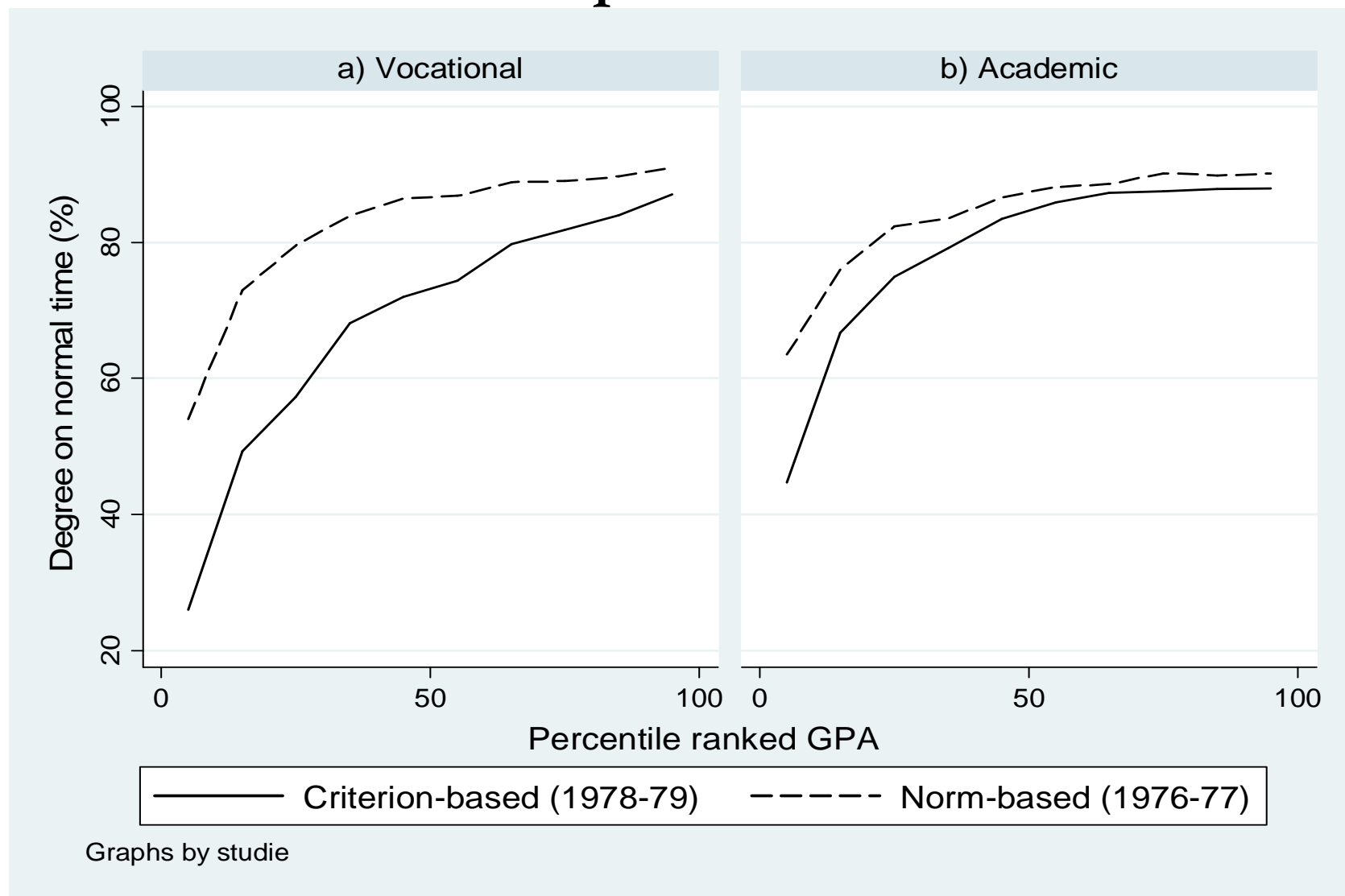
Evaluation evidence – The reform of the grading system

- Remember: Hurdle to get a degree increased because **Fail** is given in the new grading system
- The new grading system applied to everyone in a given year
- Empirical strategy: Take 1976-79 cohorts
 - Graded according to the old norm-based system in compulsory school
 - 1978-79 cohorts were graded according to the new system in USS
 - 1976-77 cohort were graded according to the old system
- Key identifying assumption:
 - No changes in generic skills across cohorts. (trends can be “netted out” using the fact that there are 2 cohorts pre/post reform)
 - No other policy changes affecting outcomes

Data and study population

- Swedish register data containing
 - Type of track
 - Individual and family characteristics
 - Outcomes: Degree from USS on “normal time”, Educational attainment, and Earnings (age 26)
- Study population
 - Individuals who finished compulsory school (on time, age 16)
 - And directly enrolled in 3-year USS

Descriptive evidence



Understanding the earnings effects

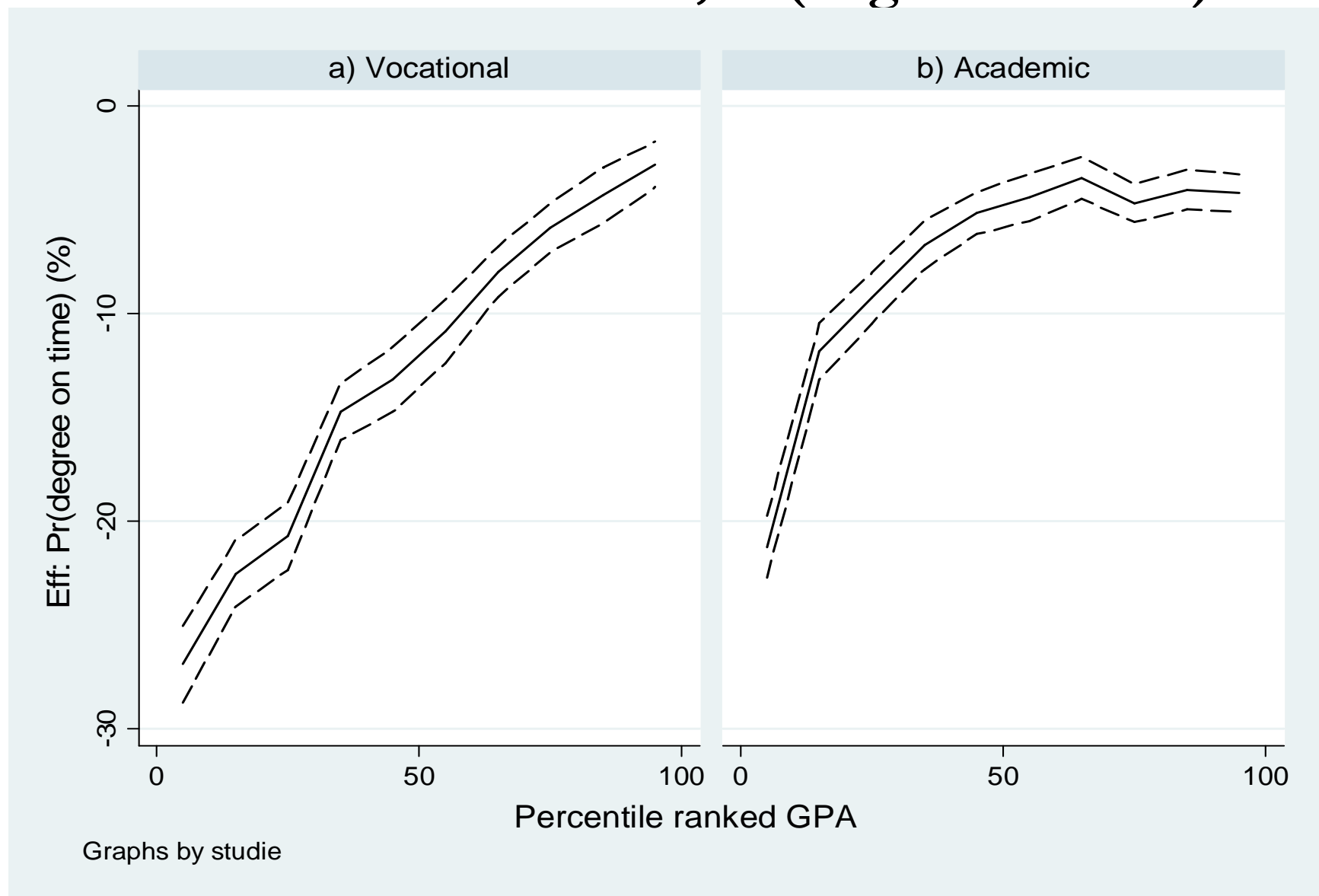
- Compare effect of $\Pr(\text{degree on time})$ and $\Pr(3 \text{ yrs. USS})$
 - If effect on $\Pr(3 \text{ yrs. of USS})$ smaller than $\Pr(\text{degree on time})$ (in abs. magn.), then students used alternative routes to degree
 - If effect on $\Pr(3 \text{ yrs. of USS}) = 0$ then only longer time to a given degree (implying less labor market experience)
- Earnings effects?
 - If dropped out \rightarrow schooling (s) $\downarrow \rightarrow$ earnings \downarrow
 - If same s but no degree \rightarrow bad signal (?) \rightarrow earnings \downarrow
 - If longer time to degree \rightarrow less experience \rightarrow earnings \downarrow
 - Hurdle \rightarrow effort $\uparrow \rightarrow$ skills (given attainm.) $\uparrow \rightarrow$ earnings \uparrow

Average effects, educational outcomes

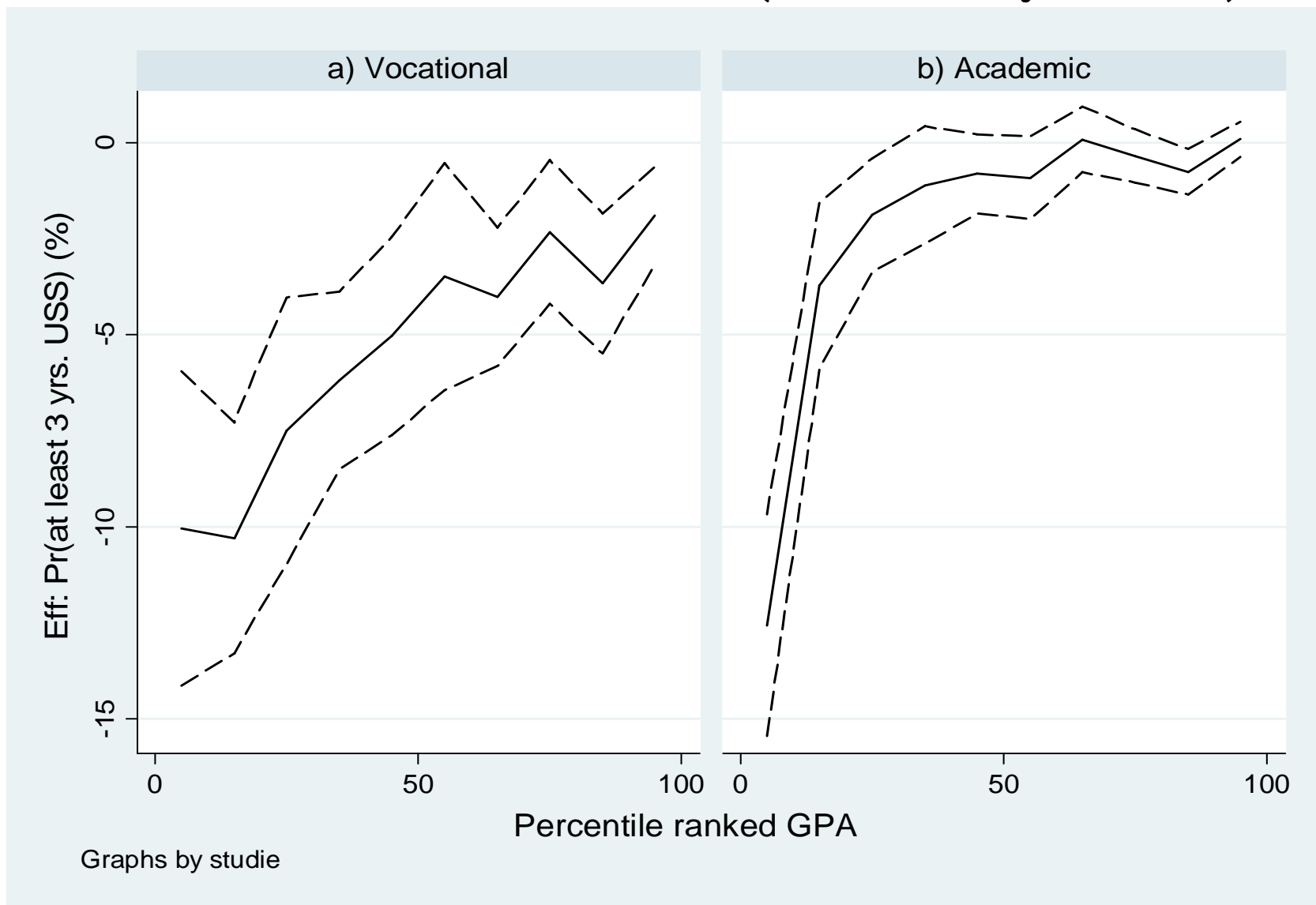
Outcome	Grading reform effect
<u>Vocational tracks</u> (# individuals: 116,560)	
(1) Pr(degree on time)	-12.9 (0.5)
Mean dependent variable, cohorts born 1976–77	82.4
(2) Pr(at least 3 yrs of USS)	-5.1 (0.4)
Mean dependent variable, cohorts born 1976–77	91.1
<u>Academic tracks</u> (# individuals: 176,539)	
(1) Pr(degree on time)	-7.6 (0.4)
Mean dependent variable, cohorts born 1976–77	84.1
(2) Pr(at least 3 yrs of USS)	-1.4 (0.2)
Mean dependent variable, cohorts born 1976–77	96.6

Compulsory school GPA, gender, and trends held constant

Distributional effects, Pr(degree on time)



Distributional effects, Pr(at least 3 yrs USS)

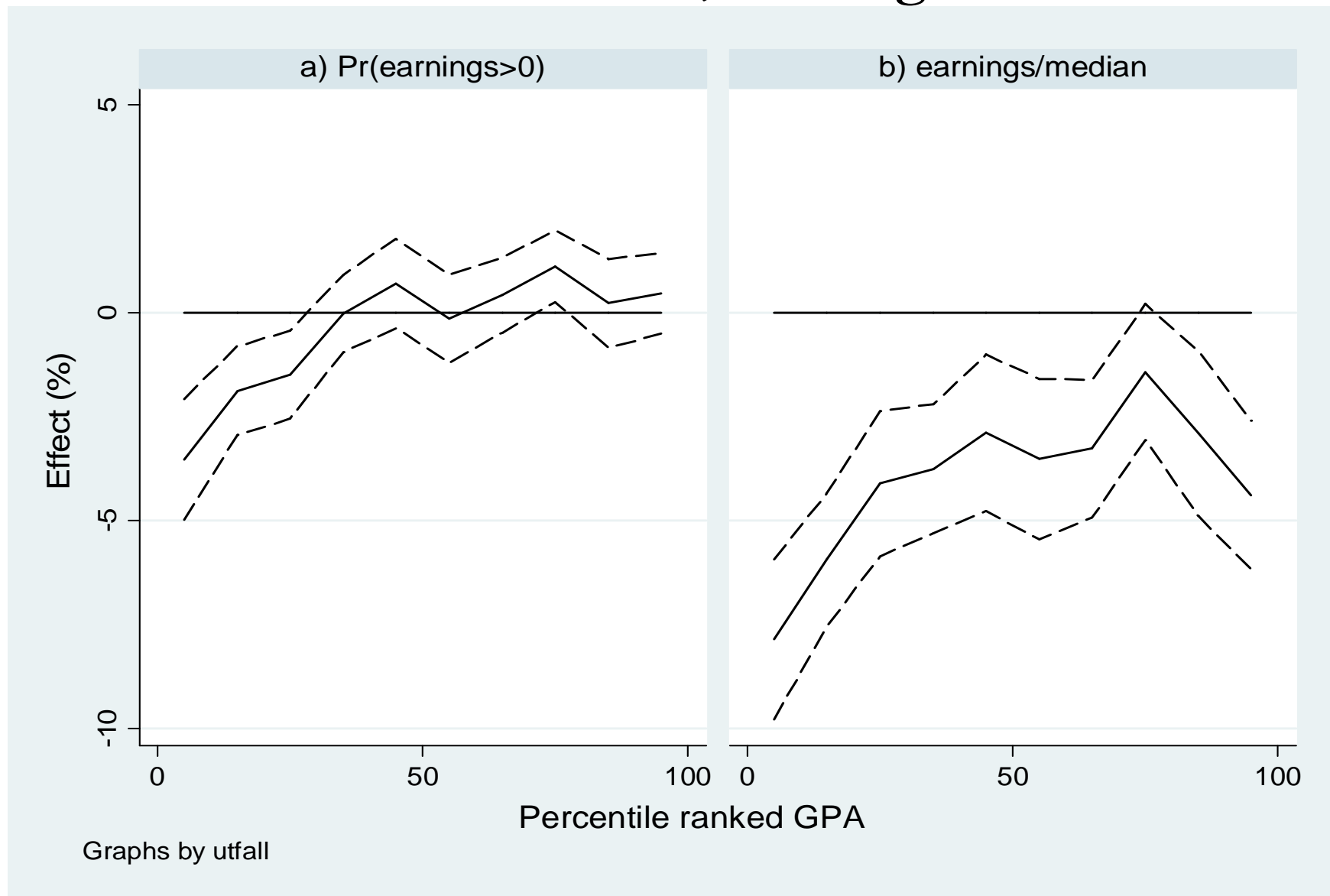


Average effects, earnings outcomes

(Only vocational tracks, age 26)

Outcome	Grading reform effect
(1) Pr(annual earnings > 0)	<div style="border: 2px solid red; padding: 5px; display: inline-block;"> -0.4 (0.4) </div>
Mean dependent variable, cohorts born 1976–77	91.7
(2) Earnings relative to median earnings	<div style="border: 2px solid red; padding: 5px; display: inline-block;"> -4.6 (0.6) </div>
Mean dependent variable, cohorts born 1976–77	76.6

Distributional effects, earnings outcomes



Concluding remarks

- Grading reform produced worse educational and labor market outcomes
 - Particularly for pupils who were low-achieving in compulsory school
- For disadvantaged students, the reforms during the 1990s introduced a “double hurdle”
 - More emphasis on theoretical skills
 - Higher graduation standard
 - The combined effect of these two probably made things even worse (higher graduation standard with same emphasis on vocational skills would not have been as bad)

Concluding remarks

- More (general) education is not for everyone
- Low-achieving students need a route to the labor market. Such a route provided by vocational training
- If you want to reduce social stratification in higher ed
 - It is probably misguided to emphasize general skills at the upper-secondary level (too late)
 - Such policies imposes costs on the mass of vocational students
 - Without apparent benefits for high-achieving students in vocational education (Could become eligible via 2nd chance education, anyhow)

Add-on: Pr(university entry) and parental schooling

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parental schooling (yrs.)	6.7% (0.3)	4.7% (0.3)	4.4% (0.2)	3.5% (0.3)	2.9% (0.3)	2.0% (0.2)	1.8% (0.2)
Controlling for:							
Test performance at age 10		X	X	X	X	X	X
Test performance at age 13			X	X	X	X	X
Test performance at age 16				X	X	X	X
Compulsory school GPA					X	X	X
USS program						X	X
USS GPA							X
Share of total reduction (4.9%) attributable to added variable	41%	6%	18%	12%	18%	4%	