

The Importance of GPA Requirements for VET Education and Low-income Students

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- What we mean by CTE/VET in this project: *Secondary education with emphasis on skills directly relevant to the labor market*
- System features vary by country
 - Apprenticeship/school based, secondary/tertiary, length, ...
- A general goal
 - Provide non-academic path to labor market attachment
 - Important for students less likely to attain good High school/college degrees
- Big policy question
 - What program structures increase continued program enrollment and labor market attachment?

Research Question

- *What is the effect of non-binding GPA screening at VET entry on student retention rates?*

This Paper

- Danish Reform from 2014: Minimum GPA requirement
 - Short term goal: Increase quality of students and increase maintained enrollment
 - Long term goal: Increased application rates
- Full population Danish administrative data, 2009-2017
- Estimation procedure to identify causal effects

Main Findings

- Initial effects of screening is fewer accepted low-SES students
 - GPA screening leads to lower 1st month enrollment rates
- Negative/no demand side response from firms hiring apprentices
 - Firms' appear to respond fast to changes policy changes
 - Demand side behavior also shaped by supply-side policies

Main Findings

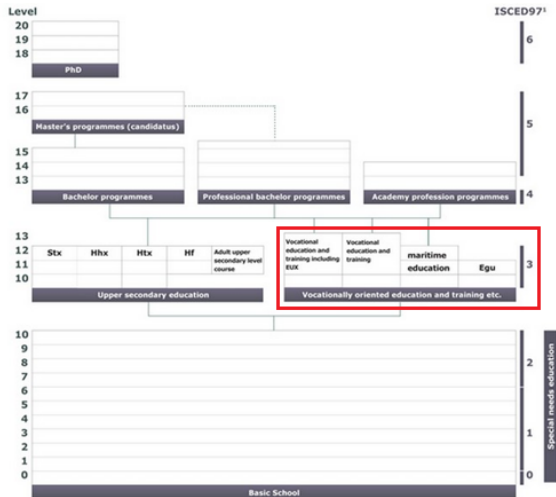
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Policy Implications

- Reforms should should consider (unintended) socio-economic impacts
- Screening metrics for VET entry should be aligned with apprenticeship metrics

- VET Graduation and Returns
 - Böckerman et al (2018), Brunner et al (2019), Dougherty (2018), Festerer et al. (2008), Hanushek et al (2017), Hemelt, et al (2018), Kemple & Willner (2008), Krueger & Kumar (2004), Silliman & Virtanen (2019), Wolter & Ryan (2011)
- Features of VET systems and at risk students
 - Culpepper (2003, 2007), Dougherty & Macdonald (2019), Dougherty et al (2019), Dustman & Schönberg (2009), Hall & Soskice (2001), Ryan et al (2013), Visser (2009), Wolter & Ryan (2011)

The Vocational Education Setting



Source: Danish Ministry of Education, 2019.

VET in Denmark

- 18 percent of a youth cohort applied to VET in 2014
- 3-4 years, often leading to labor market entry
- General structure for 4-year programs
 - Year 1: School based introduction and search for apprenticeship
 - Year 2-4: Apprenticeship and school based learning
- Exceptions: Short-term nursery educations and business degrees obtained in <3 years
 - Also include apprenticeships and were affected by reform

Reform of 2014

- Reform content:¹
 - Before: All students *applying* to VET accepted
 - After: Pass Math and Danish in primary school OR retake test to pass
- Purpose: Increase quality of students in program to
 - 1 Short term: Increase maintained enrollment
 - 2 Long term: Increase application rate

¹Additional content: Changed structure of first year, split of students above 25 from students directly from primary school. Will not be affecting our estimates.

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Important: We only evaluate short term effects

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Danish Administrative Data

- Primary School grades by subject
- Applications to secondary education programs
- Maintained enrollment spells
- Child and parental demographics - including age, gender, income, labor market participation, ...

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Evaluation

- Approach: Comparing students just above/below GPA threshold for 2011-2016 cohorts
- Outcomes: Maintained enrollment at 1, 6, 12, and 15 months into VET program

The Students

Sample: 2011-2016 VET applicants from 9th/10th grade, 73,314 observations

GPA
Requirements

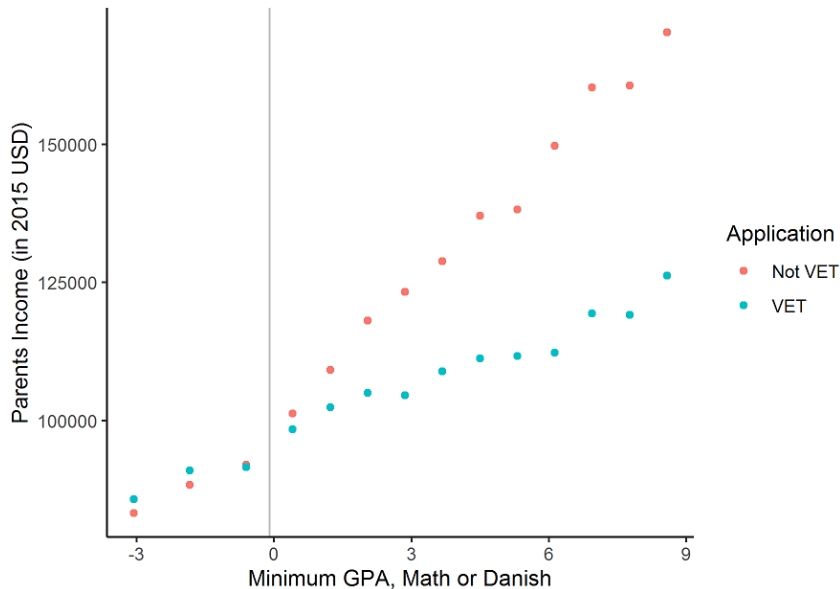
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Introduction

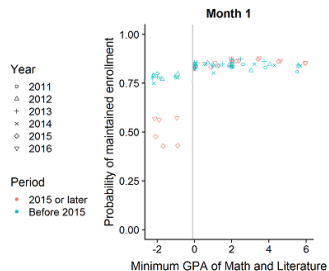
Setting, Reform,
and Data

Results

Conclusion



Main Results - Graphical DiD representation



- Month 1: Reform leads to a 30 pct-point drop in students participation

▶ Dropouts

▶ Model

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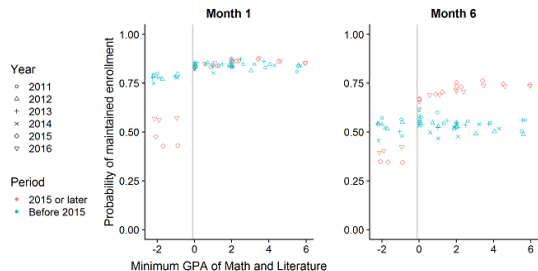
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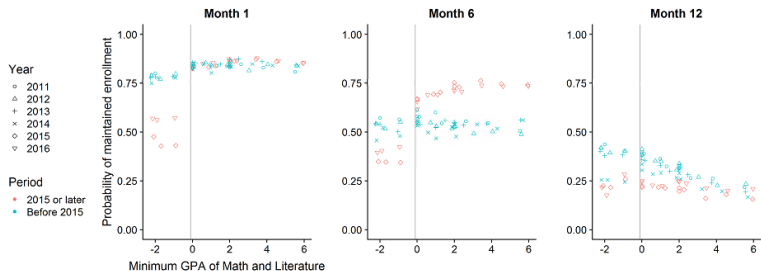
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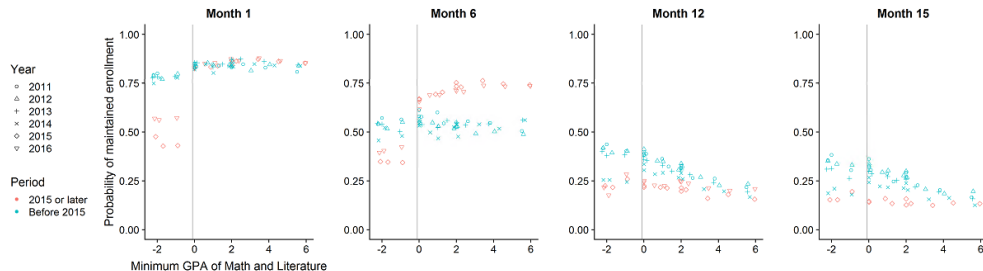
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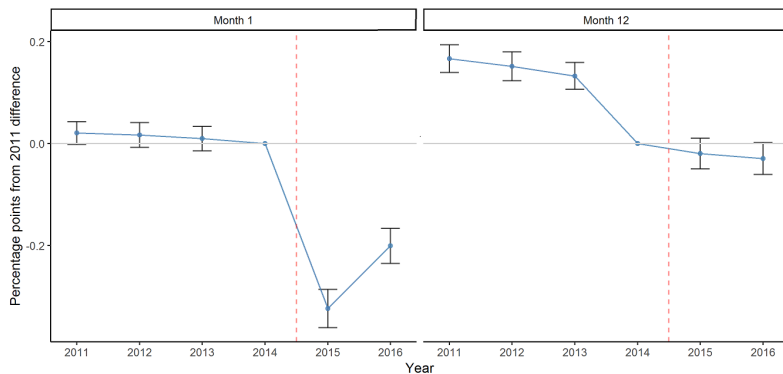
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- Month 12: Apprenticeship requirement starts. Drop for 2014 cohort below threshold, no effect later on

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Main Findings (2) - Event Study representation



Event study effects estimated with GPA bandwidth of 2 and standard errors clustered at primary school.

- Month 1: Fewer low-SES students enter program
- Month 12: Demand side (firms) respond - also fewer low-SES students
 - GPA appears to be 'wrong' screening mechanism

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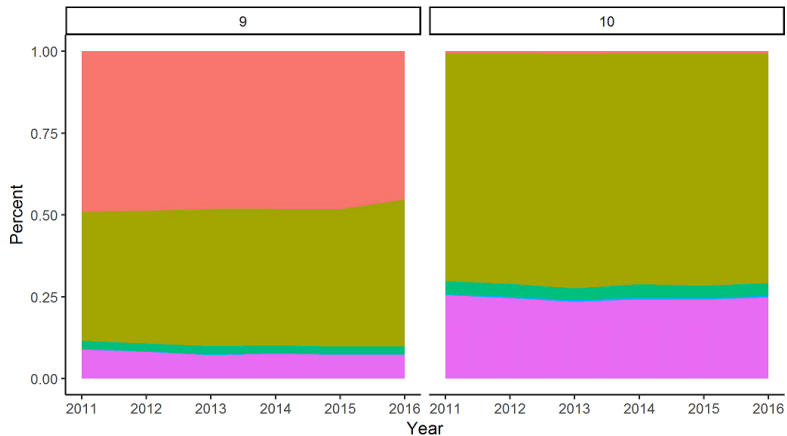
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Appendix

Primary School Students' Applications

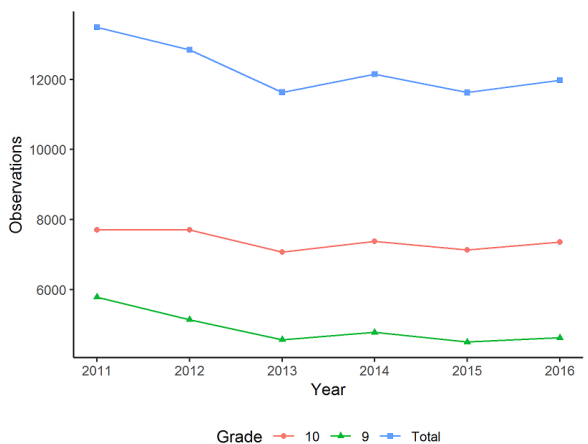


1st Priority 10th grade High School Other Special Secondary VET

Sample includes all students with application information from the application system.

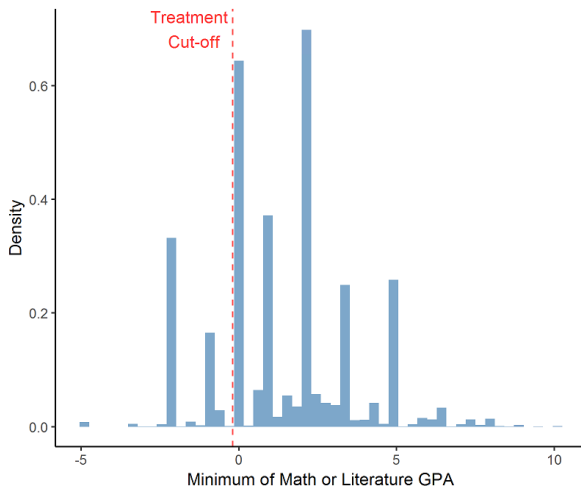
- The figure shows primary school students' first priority education choice at the end of compulsory 9th grade and optional 10th grade.

Number of students with VET as first priority



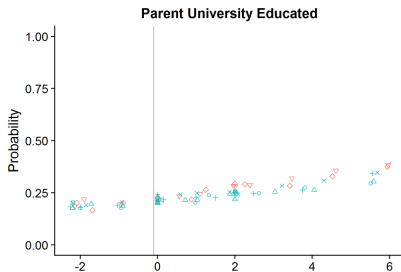
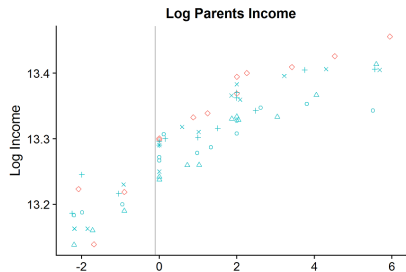
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Number of students with VET as first priority



▶ Back to data section

The Students (2)

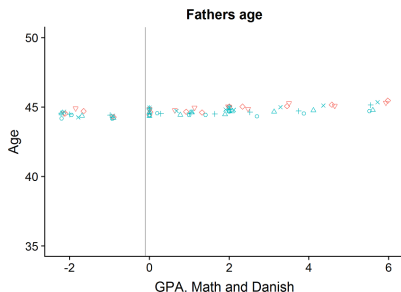


Year

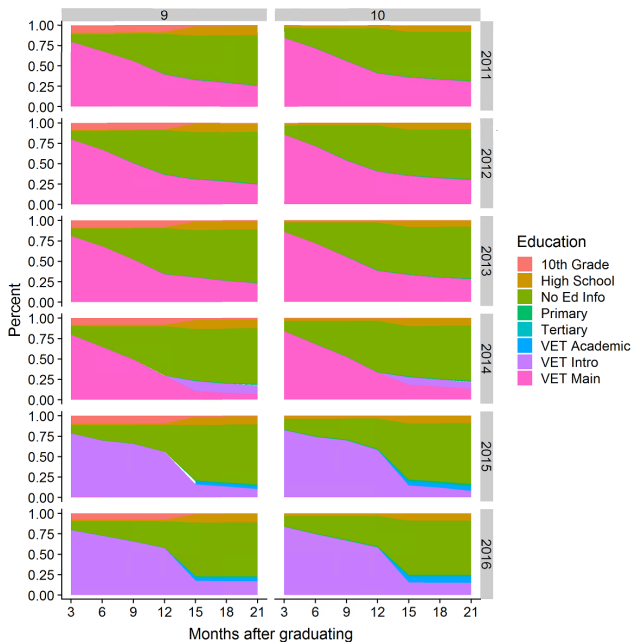
- 2011
- △ 2012
- + 2013
- × 2014
- ◇ 2015

Period

- 2015 or later
- Before 2015



Dropouts



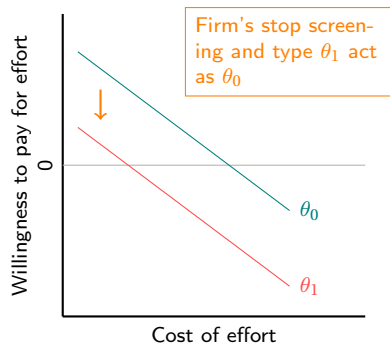
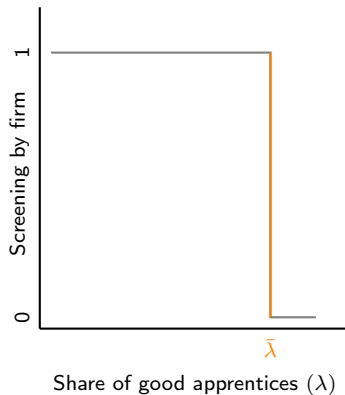
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Understanding results - A Model of effort and signalling

Intuition of model

- Students have enrolled in VET and search for apprenticeship positions
 - Have academic ability signal from primary school
 - Effort in search depends on (1) effort's effect on search-success, and (2) outside options (primary school signal)
- Firms pick students as apprentices
 - Screen applicants on search effort - effect of effort increases in students' productivity heterogeneity
- Equilibrium student intake: Perfect Bayesian Nash equilibrium (firms' expectations about number of applicants and their effort satisfied)
- Model takeaways
 - If effort is importance for search success, low GPA students put in higher effort and get more apprenticeships
 - If firms' get signal of more productive students then they screen less, low GPA students lowers effort - GPA-Enrollment gradient weakens

Understanding results - A Model of effort and signalling



▶ Back to DiD