

Recitation 7: Regression discontinuity design (RDD)

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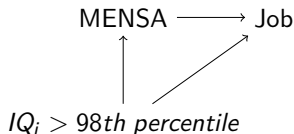
December, 2020



NEW YORK UNIVERSITY

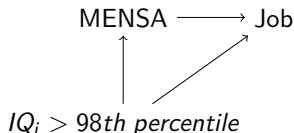
Using thresholds

- Treatment assignment may depend on meeting a requirement.
- Let's go back to think about IQ scores.
- MENSA membership if score is above 98th percentile.
- Opportunity to network and obtain a high paying job.



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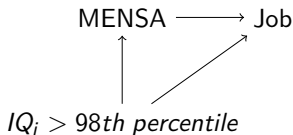


In regression form:

$$Job_i = \alpha + \beta MENSA_i + f(IQ_i) + \epsilon_i$$

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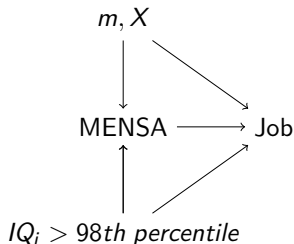
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- Is this a sharp or fuzzy RDD?

Confounding may still be an issue

- A discontinuity is a natural experiment of sorts.
- So there can be still be confounders.
- These confounders can generate *sorting*.



So we control for it:

$$Job_{im} = \alpha + \beta MENSA_{im} + f(IQ_{im}) + X'_{im}\theta + \gamma_m + \epsilon_{im}$$

What does RDD do?

Elements of a RDD

- ① Identify the outcome
- ② Identify the running variable.
- ③ Identify the threshold.
- ④ Identify the number of bins.
 - Econometric software does this for you.
- ⑤ Identify the optimal bandwidth or window.
 - Econometric software does this for you.
- ⑥ Check for the absence of sorting (i.e., a balance table).
- ⑦ Run your RDD regression.

Working through an example

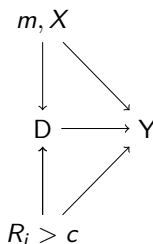
- PISA is a worldwide standardized test of math, reading and science.
- Done every 3 years: 2006-2018.
- The test takes place almost at the same time in every country.
- It tests individuals of about 16 years of age.

Our question is: does being below the modal grade for age matter?

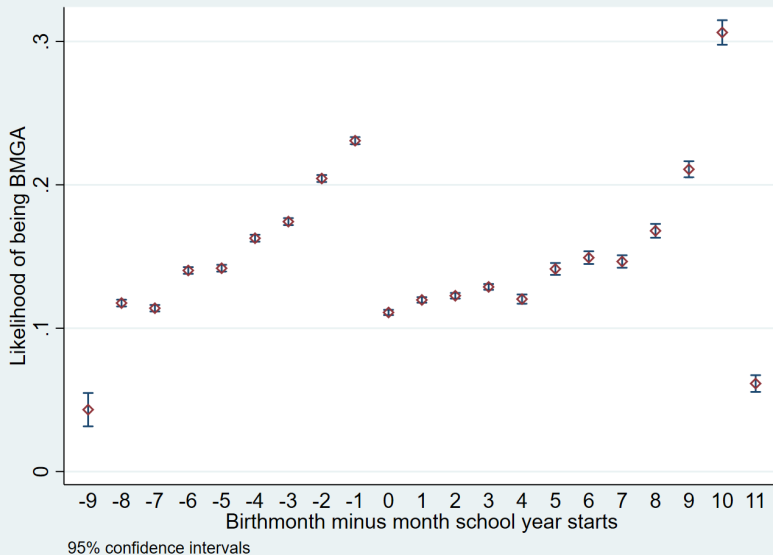
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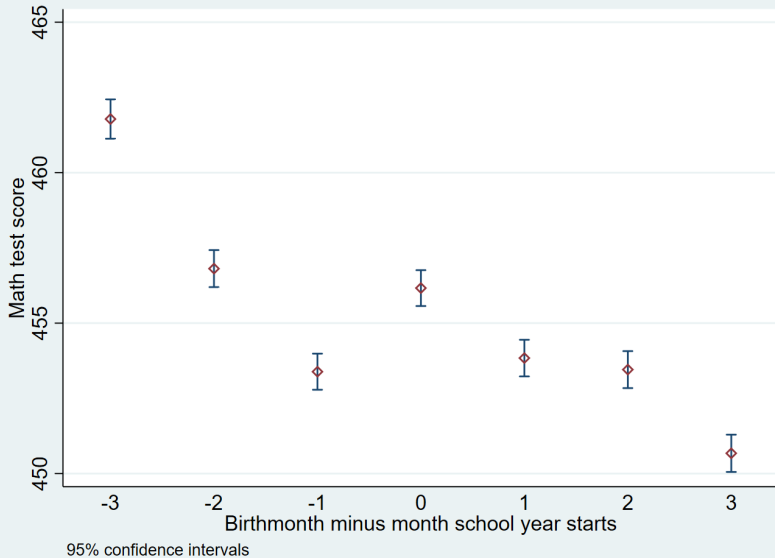
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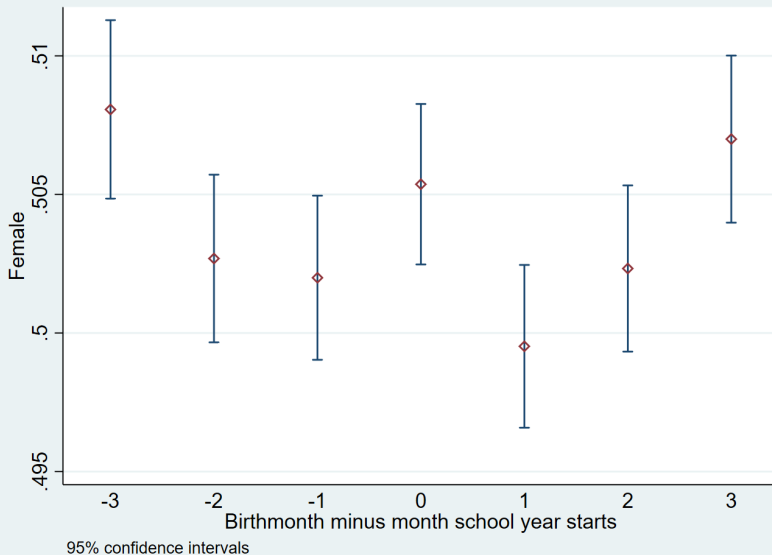
The effect of BMGA



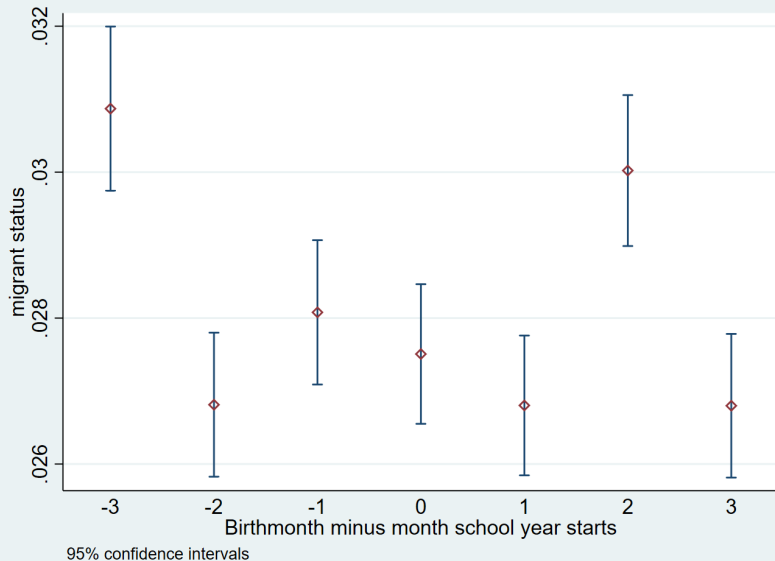
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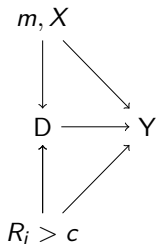


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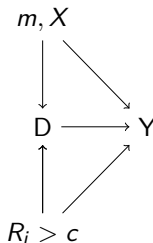
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$$Score_{imt} = \alpha + \beta BMGA_{imt} + f(Birthmonth_{imt}) + X'_{im}\theta + \gamma_m + \rho_t + \epsilon_{imt}$$