1 Appendix: Formal Derivation of Division & Minor Tables and Regressions

1.1 Formal Derivation of Division

Formally, let the left and right side of the RD analysis during the pre-standard and post-standard years be defined as follows:

$$\begin{aligned}
\mu_{l,c} &= \lim_{x \to 0} E(Y(0)|x = 0, y = c) \\
\mu_{r,c} &= \lim_{0 \leftarrow x} E(Y(1)|x = 0, y = c) \\
\mu_{l,t} &= \lim_{x \to 0} E(Y(0)|x = 0, y = t) \\
\mu_{r,t} &= \lim_{0 \leftarrow x} E(Y(1)|x = 0, y = t)
\end{aligned}$$

where x and Y are the assignment and outcome variables respectively, l and r indicates the assignment variable approaching the discontinuity from the left hand side and the right hand side respectively, c and t are pre-standard and post-standard years respectively, and 0 and 1 represents not treated and treated respectively.

Following Imbens and Lemieux (2008), the discontinuity that is of usual interest is:

$$\tau_t = \mu_{r,t} - \mu_{l,t}$$

and the control discontinuity is:

$$\tau_c = \mu_{r,c} - \mu_{l,c}$$

To capture the impact from passing the exam, we must subtract probability of taking the rigorous coursework in the pre-standard year conditional on not passing from the probability of taking the rigorous sequence in the post-standard year conditional on passing. From this amount, we must subtract the difference between the probabilities of taking the rigorous coursework conditional on passing and failing during the pre-standard year. That is:

$$\begin{aligned}
\tau_1 &= \mu_{r,t} - \mu_{l,c} \\
\tau_2 &= \mu_{r,c} - \mu_{l,c} \\
\tau_{pass} &= \tau_1 - \tau_2 = \mu_{r,t} - \mu_{r,c}
\end{aligned}$$

By the same logic, the impact of failing is $\tau_{fail} = \mu_{l,c} - \mu_{l,t}$. Furthermore, $\tau_{fail} + \tau_{pass} = (\mu_{r,t} - \mu_{l,t}) - (\mu_{r,c} - \mu_{l,c})$, which is the difference between the post-standard RD and the pre-standard RD.

1.2 Minor Tables and Regressions

Table 1: History of Algebra I EOC Test Score Average

Year	**Avg. Score**	**Std. Dev.**	**N**
2001	6.906	8.366	43329
2002	8.078	8.717	48412
2003	7.463	8.711	40335
2004	8.570	8.964	45590
2005	8.888	8.676	34488
2006	7.846	8.426	40686

Table 2: College Plans (Prior to Alg I Exam Results) and Math Course Rigor Next Year: 2006 Sample

	9th gr. % w/ college plans	**10th gr. % w/ college plans**
Rigorous Math	0.793	0.712
No Rigorous Math	0.611	0.577

Table 3: Division of Discontinuity: 10th grade[†]

bandwidth	(1)	(2)	(3)	(4)	(5)
			τ_{pass}		
2.1113	0.0523 (0.0378)	0.0779 (0.0715)	0.0779 (0.0715)	-0.0085 (0.0404)	0.0381 (0.0384)
1.0557	0.0368 (0.0590)	0.0618 (0.0431)	0.0776 (0.0440) *	-0.0381 (0.0367)	0.0163 (0.0467)
4.2226	0.0479 (0.0268)	0.0603 (0.0291) **	0.0585 (0.0298) *	0.0086 (0.0284)	0.0395 (0.0276)
4.1113	0.0545 (0.0304)*	0.0616 (0.0338) *	0.0658 (0.0346) *	0.0048 (0.0324)	0.0432 (0.0313)
7.1113	0.0451 (0.0257)*	0.0581 (0.0278) **	0.0564 (0.0285) **	0.0097 (0.0273)	0.0377 (0.0258)
			τ_{fail}		
2.2459	0.0177 (0.0467)	0.0214 (0.0837)	0.0214 (0.0837)	-0.0003 (0.0533)	0.0136 (0.0528)
1.1230	0.0166 (0.0590)	0.0268 (0.0580)	0.0272 (0.0636)	0.0034 (0.0730)	0.0212 (0.0476)
4.4918	0.0164 (0.0372)	0.0090 (0.0448)	0.0165 (0.0486)	0.0092 (0.0415)	0.0119 (0.0372)
4.2459	-0.0034 (0.0329)	0.0036 (0.0383)	-0.0139 (0.0414)	-0.0043 (0.0360)	-0.0061 (0.0323)
7.2459	-0.0255 (0.0288)	-0.0143 (0.0318)	-0.0241 (0.0344)	-0.0181 (0.0313)	-0.0237 (0.0275)

Specification (1) has linear normalized score controls. Specification (2) controls for normalized score squared. Specification (3) controls for normalized score cubed. Specification (4) controls for student ethnicity and gender and teacher ethnicity, gender, and experience, and school fixed-effects. Specification (5) controls for all covariates in Specification (4) and adds clustered errors at the school level. Specification (5) is the preferred specification. Bandwidths are as follows: 1st row (optimal bandwidth), 2nd row (half of optimal bandwidth), 3rd row (twice optimal bandwidth), 4th row (optimal bandwidth + 2), 5th row (optimal bandwidth + 5). *** denotes an estimate significant at the 1% level; ** the 5% level; * the 10% level. Standard errors are in parentheses.

1.3 RD results at other bandwidths

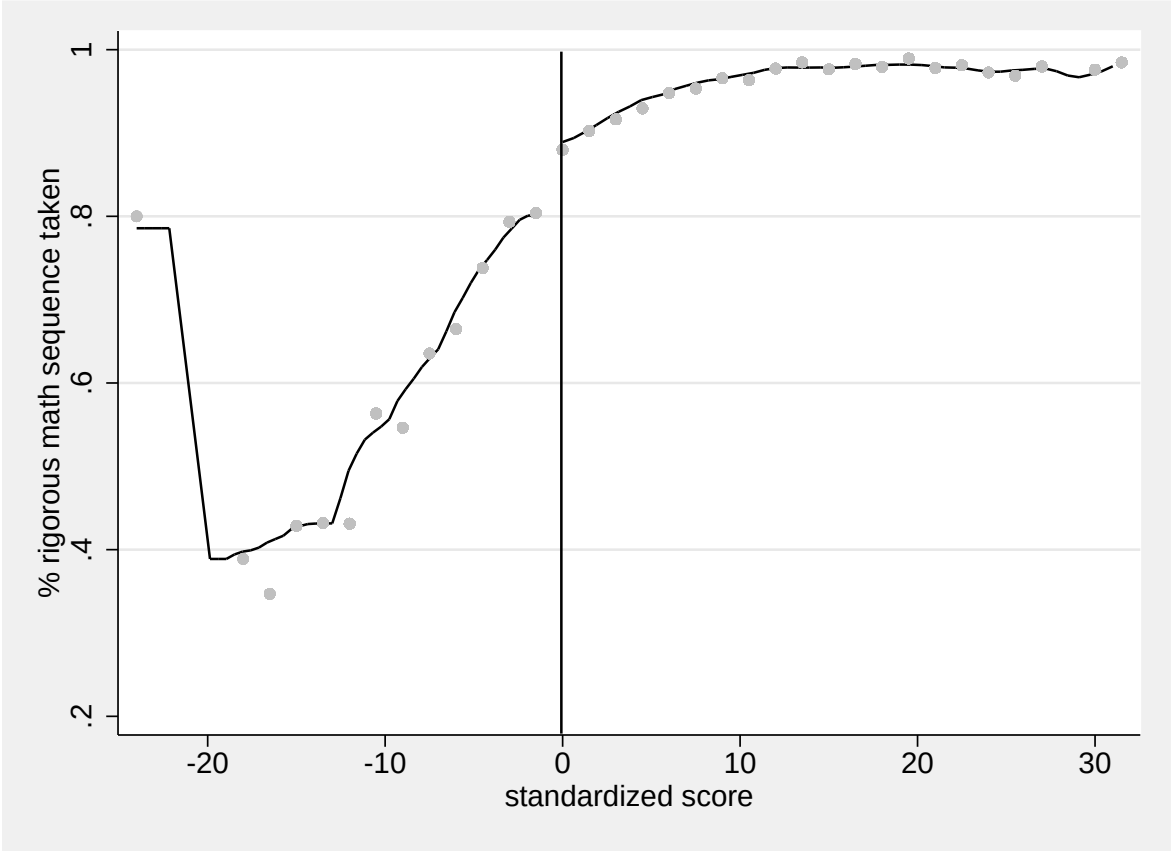

Figure 1: 2006 RD at ideal bandwidth

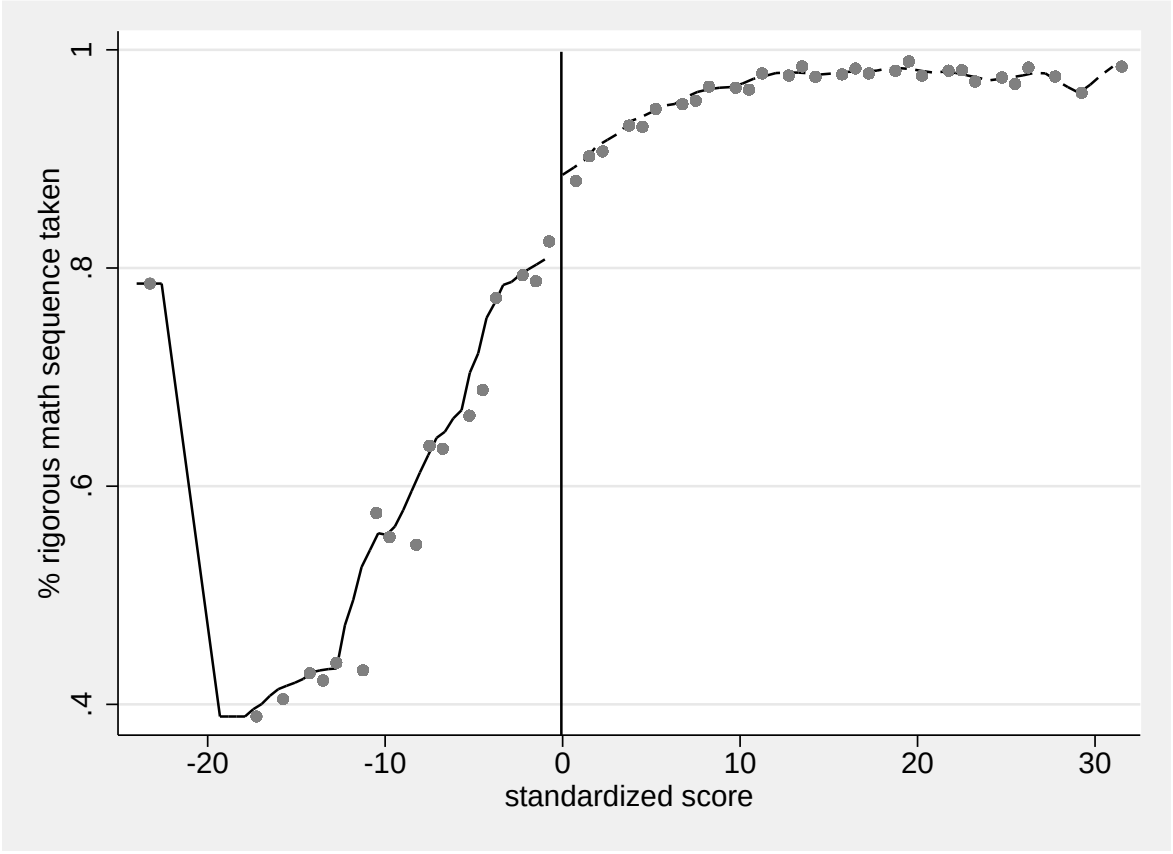

Figure 2: 2006 RD at half ideal bandwidth

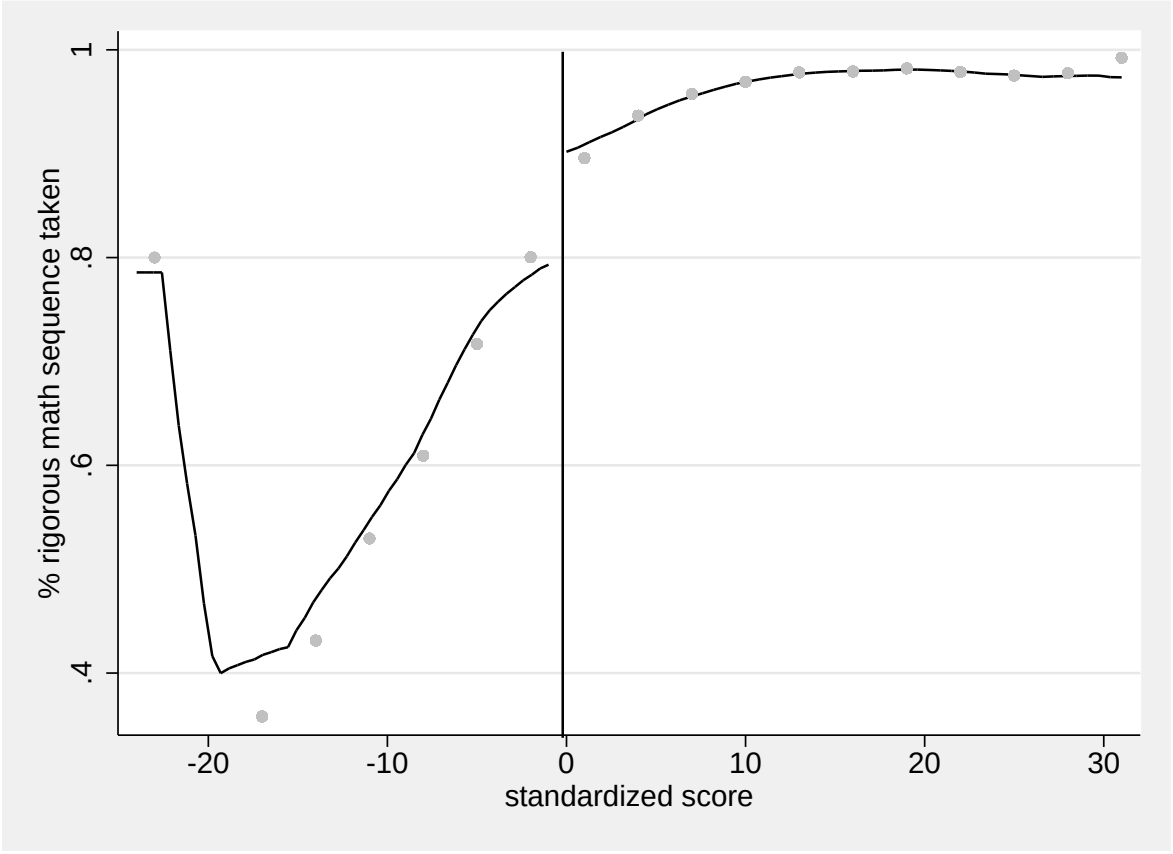

Figure 3: 2006 RD at double ideal bandwidth