Assignment 7

Foundations of Econometrics

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This is short document attached to the do-file submitted for Assignment 7 with brief comments. For the exact construction methods of figures and tables, I refer to the do-file that is submitted as well.

1 Reproduction of Figures 4 and 6 in Oreopoulos (2006)

See Figures 1 and 2 for my reproductions of Figures 4 and 6 in Oreopoulos (2006), respectively. The dots are means of weighted averages of age left education (for Figure 1) and for averages of log earnings (for Figure 2), where the weights are `wght`. Also a polynomial fit is added.

There seems to be a positive effect of increasing school-leaving aged from 14 to 15 on avg. age left education, as is seen in Figure 1. The effect of the school-leaving policy change is less pronounced for log annual earnings however, as is seen in Figure 2. There could however still be a discontinuity. Whether these jumps are statistically significant is tested in Section 2.

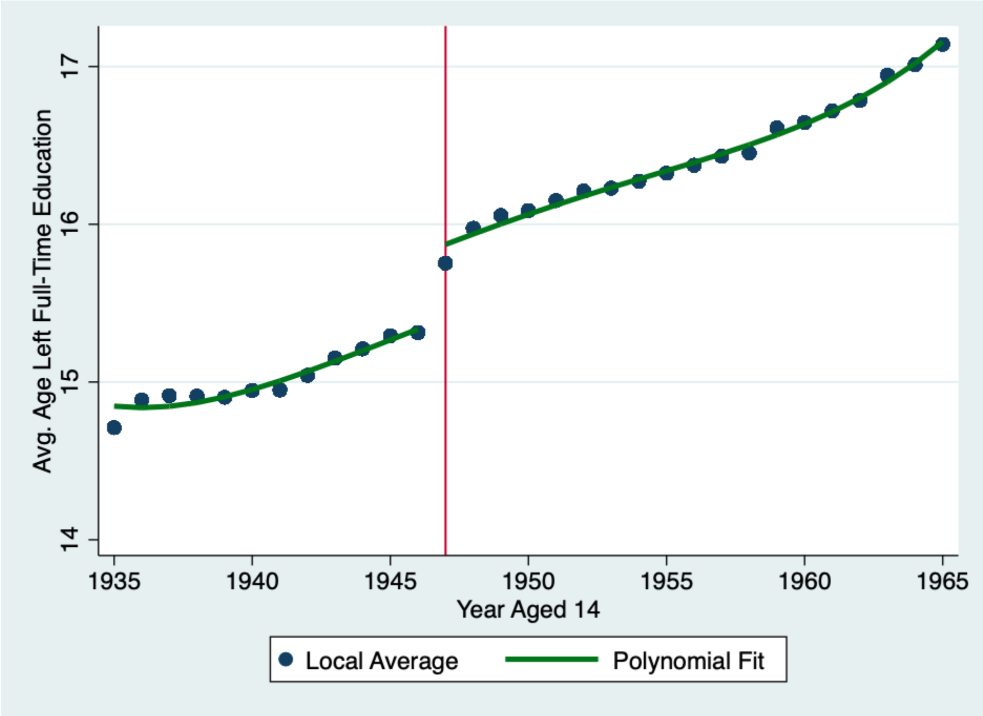

Figure 1: Reproduction of Figure 4 in Oreopoulos (2006)

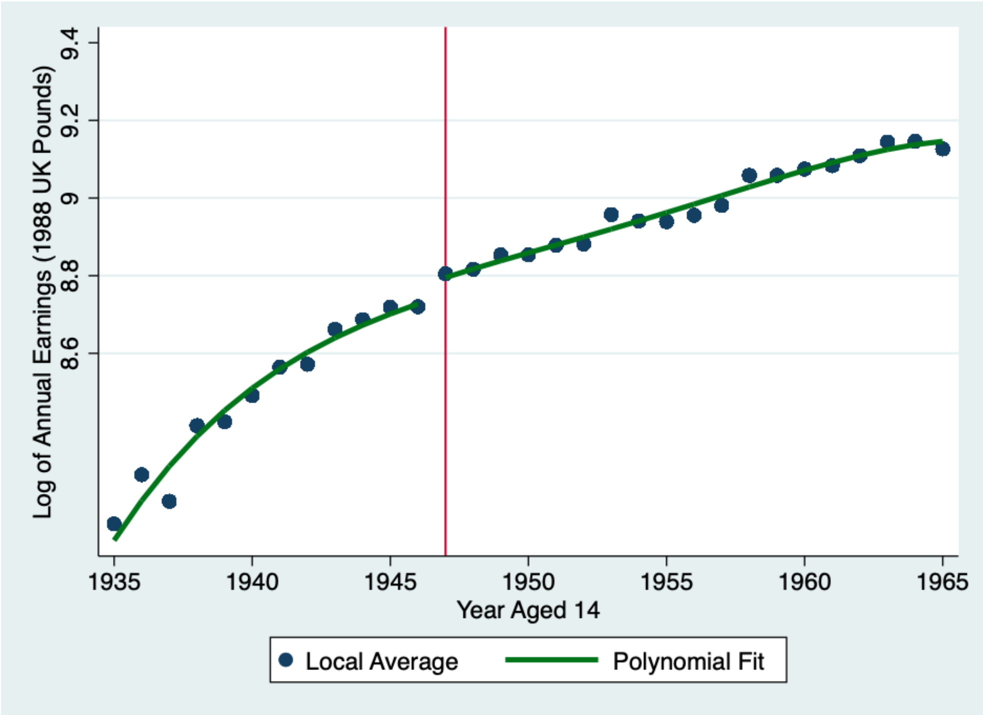

Figure 2: Reproduction of Figure 6 in Oreopoulos (2006)

2 Reproduction of Table 1 in Oreopoulos (2006)

See Table 1 for the reproduction of Table 1 in Oreopoulos (2006). Here is measured whether the "jumps" in discontinuity in Figures 1 and 2 are statistically significant. They are all statistically significant while columns 4 to 6 (corresponding to Figure 2) are much smaller in magnitude compared to columns 1 to 3 (corresponding to Figure 1). This is as expected from the gaps in the figures. It can be noted that the estimates in columns 1 to 3 are quite similar to those in Oreopoulos (2006) while those columns 4 to 6 are very different. I assume this is due to the paper estimating real annual earnings while this reproduction uses nominal earnings.

	(1)	(2)	(3)	(4)	(5)	(6)
	(First stage) dependent variable: Age finished full-time school (`agelfted`)			(Reduced form) dependent variable: Log annual earnings (`learn`)		
$\mathbb{I}$(faced school leaving age of 15 at age 14): `drop15`	0.408***	0.408***	0.435***	0.0292*	0.0255	0.0315
	(0.0632)	(0.0636)	(0.0734)	(0.0160)	(0.0198)	(0.0213)
Birth Cohort Polynomial Controls	+	+	+	+	+	+
Age Polynomial Controls		+			+	
Age Dummies			+			+
N	55,088	55,088	55,088	55,088	55,088	55,088

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Cluster-robust standard errors in $(\cdot)$. $\mathbb{I}(\cdot)$ is an indicator function equal to unity if enclosed statement is true and zero otherwise.

Table 1: Reproduction of Table 1 in Oreopoulos (2006)

3 Reproduction of Table 2 in Oreopoulos (2006)

See Table 2 for the reproduction of Table 2 in Oreopoulos (2006). The dependent variable is log annual earnings (`learn`). Estimates in columns 1 to 3 measure a around 6.5 percentage points earnings premium for staying in school. They are all statistically significant. There could be confounders in the regular OLS regressions, namely the never-takers. Those that leave at 14 regardless could be thought to negatively bias effects (they might have characteristics that are not valued in the educational system nor labor market).

Columns 4 to 6 show the RD-IV estimates. In fact, these are slightly higher than OLS estimates when using age dummies controls and no age controls. The magnitude then is around 7.1 percentage points earnings premium. With quartic age polynomial controls the effect is almost equivalent to OLS estimates. Only the estimates without controls (column 4) are statistically significant. The measured effect with fuzzy RD are a LATE so the effect is only among the compliers, i.e those that stay one year longer in school and wouldn't if the compulsory age had not been raised one year. The LATE effect also only holds around the cutoff. As was the case in Table 1, the estimates are not comparable to Oreopoulos (2006) and I again assume this is due to the difference in real and nominal earnings.

	(1)	(2)	(3)	(4)	(5)	(6)
	Returns to schooling: OLS			Returns to compulsory schooling: IV		
Age left full-time education (agelfted)	0.0666*** (0.00105)	0.0642*** (0.00108)	0.0643*** (0.00109)	0.0714* (0.0405)	0.0641 (0.0488)	0.0712 (0.0489)
Birth Cohort Polynomial Controls	+	+	+	+	+	+
Age Polynomial Controls		+			+	
Age Dummies			+			+
N	55,088	55,088	55,088	55,088	55,088	55,088

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Cluster-robust standard errors in $(\cdot)$. Age left full-time education (agelfted) instrumented by whether a cohort faced a school-leaving age of 15 at age 14 (drop15) in columns 4 through 6.

Table 2: Reproduction of Table 2 in Oreopoulos (2006)

References

Oreopoulos, P. (2006): "Estimating Average and Local Average Treatment Effects of Education when Compulsory Schooling Laws Really Matter," *American Economic Review*, 96, 152–175.