

Comments on: “The Effect of High-Tech
Clusters on the Productivity of Top Inventors:
Comment” by M. Weibe

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Summary #1

- ▶ We are interested in knowing the strength of agglomeration effects on innovation. Moretti (2021) estimates this relationship using panel data describing inventor by year by city level patent filings.
- ▶ This is conventional,

$$y = AN^{\alpha}.$$

but y is patents per year instead of wages or output, and N is population of *inventors* instead of total population.

- ▶ Moretti conducts six main exercises. Weibe finds problems with four.
- ▶ The reproducible/correct Moretti estimates, together with cross-sectional estimates from Carlino et al. (2007) suggest ($\alpha \in [0.05, 0.25]$). This is a quite wide range for an agglomeration parameter.
- ▶ I did not verify Weibe's claims of coding errors.

Exercise #1

Rochester inventor productivity after Kodak failure, TWFE.

1. Large effects of Kodak failure on patenting of non-Kodak inventors in Rochester post crash.
2. This is reproducible, suggests large effects, but does not give an explicit estimate of α . My back of the envelope calculation gives me about $\alpha = 0.09$.

Exercise #2

TSLS estimate of α using Kodak failure as an instrument, TWFE.

1. TWFE ATT of effect on inventor output.
2. TWFE ATT of effect on number of inventors.
3. Ratio is an estimate of $\alpha = \frac{\Delta \ln(\text{patents})}{\Delta \ln(\text{outputs})} \in [0.13, 0.25]$
4. This is reproducible.

Exercise #3

Cross-sectional estimate of α with lost of fixed-effects.

1. This is reproducible.
2. $\alpha \in [0.05, 0.09]$
3. This is, loosely, a redo of Carlino et al. (2007) with better data.

Exercise #4

“Event-study” movers design

- ▶ This result is reproducible.
- ▶ The regression specification is cross-sectional, as Weibe claims, not an event study, as Moretti describes it.
- ▶ Weibe’s redo as a better specified event study estimates $\alpha \approx 0$, but with wide confidence bands. Weibe’s redo has a lot of fixed effects and does not use the latest continuous treatment staggered TWFE estimator.
- ▶ I would like to see a little more work on this.

Exercise #5

Panel regression, instrumenting for change in city size using other-city shocks to multi city firms.

- ▶ Not reproducible, coding error in Stata.
- ▶ Moretti estimates $\alpha = \frac{\Delta \ln(\text{patents})}{\Delta \ln(\text{outputs})} \in [0.04, 0.07]$
- ▶ This is NOT reproducible. Wiebe corrected estimate, $\alpha \in [-0.03, 0.14]$ with wide confidence bands.
- ▶ Weibe gets worse first stage F than Moretti when (loosely) Weibe's claimed coding error involved Moretti matching cities to inventors at random. This needs more explanation.
- ▶ This IV probably needs “recentering” per Borusyak and Hull (2023)

Exercise #6

Coding error in counterfactual.

Conclusion

1. Moretti (2021) appears to contain a number of coding errors as well as a conceptual error in the specification of one of the main regressions.
2. The cross-sectional estimate is reproducible and is based on better data than Carlino et al. (2007). It suggests smaller, $\alpha \in [0.05, 0.09]$ instead of $\alpha \approx 0.2$.
3. Except for the Rochester/Kodak IV, which is persuasive but lacks external validity, Moretti's efforts to address standard econometric problems with the cross-sectional estimate have coding or conceptual errors.
4. Weibé's efforts to correct these errors leads to imprecisely estimated zeros that do not lead me to update from the cross-sectional estimates.

Kirill Borusyak and Peter Hull. Nonrandom exposure to exogenous shocks. *Econometrica*, 91(6):2155–2185, 2023.

Gerald A Carlino, Satyajit Chatterjee, and Robert M Hunt. Urban density and the rate of invention. *Journal of urban economics*, 61(3):389–419, 2007.

Enrico Moretti. The effect of high-tech clusters on the productivity of top inventors. *American Economic Review*, 111(10):3328–75, 2021.