# to-dos for our Spatial Paper

Your Name

January 25, 2025

1. Download all data, assuring it's in consistent years (2020 census, probably 2022 for everything else?). See Esteban's slide 14. We need CFS data, ACS data on commuting, Census Data on County Centroids, and the BEA stuff for wages and commute flows (writeup.pdf also has much more detail on this).
    - @Henrique - we were discussing the CFS stuff. Seems you do need the CFS data for the model, to allocate deficits, not just to validate it,
2. In addition to the Esteban stuff we want college education (%) by county as a proxy for the high-skill / low skill think. Which is in the ACS.
3. Data cleaning: Allocate deficits $D_i$, to counties from the CFS regions, as they do in the paper
4. Data cleaning: Compute $\bar{v}_i$ as in the paper
5. Should have the following from the data or very simply computed from it: $w_i$, $L_i$, $\bar{v}_i$
6. Estimation: Estimate $\psi$ as they do in the paper (appendix B.5.)
7. Assume $\sigma = 4$ as in paper
8. Assume $1 - \alpha = 0.4$ as in paper
9. Compute $d_{ni}$ given distances, $\psi$ and $\sigma$
10. Compute $A_i$ (system of $N =\approx 3000$ equations) as in (16) in the paper. Might require some clever computation step to make it not take a super long time.
11. Estimate $\phi$ and $\epsilon$ as in appendix.
12. Given $\lambda_{ni}$ $A_i$, $w_i$, $L_i$, $\bar{v}_i$, $R_n$, $\sigma$, $\alpha$ $\phi$, $\psi$, solve for the $3000x3000$ matrix $\mathcal{B}_{ni}$, as in (17) – THIS WILL PROBABLY BE HARD BECAUSE IT REQUIRES SOLVING FOR 9 MILLION THINGS. SEE IF WE CAN DO A CONTRACTION OR IF THERE ARE HINTS IN THE APPENDIX

13. Determine counterfacutal values for $B_{ni}$, using Jeffrey's latex writeup

14. Run the counterfactual using exact hat algebra (Appendix B2 gives pseudocode) NOTE! Our counterfactual can be expressed as just reducing $B_{ni}$. everything else will be fixed

15. This uses tattonement, so might take a long amount of computer time. ( I guess we're solving for 18 million changes) – THIS WILL ALSO PROBABLY TAKE A LONG TIME

16. Report results in compelling ways from counterfactual. Probably tables, maps (using county shape files).

17. Writing: The first 3 steps can be done in parallel with much of the above.

    - Abstract and introduction (can build off Jeffrey's writeup for esteban)
    - Background and diagnostic. This should explain how this is an intermediate step to the more ambitious model Esteban proposed with two types, and low-types wages potentially depending negatively on commute costs. (if commute costs are high, lots of taxi drivers still get to work). He also seemed to want to show differential welfare effects by city, which is not possible in this model (expected utility equalized everywhere).
    - Model / Theory - much of this will just be citing Monte et al
    - Data - much of this will just be citing Monte et al
    - Counterfactual exercise - answer all the questions posed in the problem set and comment on our results. This will be more involved, probably. Note the PSET does say "If you are interested in a non-local policy (i.e. a policy like a construction of interstate highways that affect many counties similtaneously), you do not need to compute changes in fundamentals with high level of precision (e.g., changes in commuting costs in each county), a rough approximation will suffice". So we don't need to be so defensive about how we estiamte the change in commute costs.