Comments on Zhang/Kockelman

Georg Hirte
Advancing Metropolitan Modeling for the Analysis of Urban Sustainability Policies, Riverside, CA

January 16th, 2015

Research Task

1. **Research Aims**
   - Build a dynamic spatial equilibrium model (SEM)
   - "Include more land use characteristics in applied SEM, to avoid misestimation of local travel decision, land use patterns, and community welfare"
2. **Puts together**
   - RELU-TRAN Anas and Liu (2007)
   - Endogenous growth by Demset and Rossi-Hansberg (2014)
3. **Main Features**
   - Exogenous demographics + exogenous zonal attractiveness
   - Endogenous location externalities
     - Diversity of buildings/land-use (changes in stocks; neighborhood effects)
     - Diversity of technology (innovation)

Comment 1: Dynamics in productivity

Why do you use the endogenous spatial-growth model of Desmet and Rossi-Hansberg (2014)?

1. Indeed **innovation spillover** are local
2. **Robustness:** The results are not robust with only one draw
   - They average over 100 realizations to avoid extreme changes in productivity
3. **Law of large numbers:** you need a a much larger number of districts
   - This avoids aggregate uncertainty
4. **Alternatives**: agglomeration effects in production from no. of firms and local labor supply (e.g. Rossi-Hansberg, 2004; Arnott, 2007; Rhee et al. 2014)?

Comment 2: Timing

1. **You use**: Update of population, stocks and technology in T, all decisons are made in t
   - T $[T_1, T_2, T_3, T_4]$
   - $T+1$ $[T+1_1, T+1_2, T+1_3, T+1_4]$
   - $T+2$
2. **Continuous shocks:**
   - Population shocks, innovation spillovers and changes in the housing stock occur during each year
   - In theory: why not use decisions in T, $T+1$ and $T+2$ whith updates right before decisions are made (done by Demset and Rossi-Hansberg, 2014)?
   - Consistent with your simulation

Comment 3: Dynamic equilibrium concept

1. **Uniqueness**? (draws of innovations can vary a lot)
2. **Equilibrium concept?**
   - (Anas comments on the editorial of the special issue of Env Plan A)
3. **Balanced growth path?**
   - Do you know whether the economy converges to a balanced growth path if you run it over a long enough time horizon?
   - i.e. population is constant or growth with a constant rate in the long-term
   - e.g. demolition equals construction in the long-term

Comment 4: Simulation concept

1. **Baseline simulations:**
   - Some baseline simulations with fixed population or constant population growth would help to understand the model behavior?
2. Is it possible to learn whether **initial adjustments** are
   - due to the shocks
   - or due to the adjustments to the initial balanced growth path (because you might be far away from the path to the balanced growth path of the no-policy or no-shock scenario in the beginning)?

Comment 5: Scenario building

1. **Which policy and why**?
2. **Evaluation of policies:**
   - Can you be sure that the path beyond policy scenarios (S3) is the same than with popluation shocks (S1)?
   - Are the draws of the spatial variation in innovation on average the same? (see comment 1).