Variables (layers) for satisfaction model

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A. Two agents: immigrants & econ-status

* “econ\_status”, for now, is involved in two categories:
  + housing price and living cost through economic inflation;
  + job application process and results through the competitiveness of job;

B. Model key parameters: the category where these parameters are directly involved.

1. number of immigrants

2. number of house options given to the immigrants per day: housing category

3. number of job positions given to the immigrants per day: spouse work permit & immigrants’ job application categories

4. probation period: spouse work permit & immigrants’ job application categories.

5. house price rate: housing category

6. GP access rate: hospital & health categories

7. birth care quality: birth and health categories

8. Child care quality: child care

9. RPE acceptance rate: spouse work permit category

10. Work-permit/visa acceptance rate: spouse work-permit

C. Housing

* Immigrants are initially categorized into three groups:
  + 1) those without any support from their employer (50% of immigrants)
  + 2) those with support for temporary housing (60 days) (30% of immigrants)
  + 3) those with full support for housing (no cost for housing) (20% of immigrants): assume that they have no interests in applying for rent, though they can try to buy their own house.
* Rent
  + The first (no support) and second (partially support) groups apply for rent.
  + When they apply for the rent, they are recognized as “house seekers”, which affects the inflation rate (Econ status behaves as another agent.)
  + Process:
    - When applying for the rent, each immigrant receives a certain number of house options (this number is one of the model parameters we can adjust in the model).
      * If the house market is competitive, we can assume that the number of houses available to them will be reduced.
    - Immigrants evaluate the provided options based on 7 categories: price, distance, education, safety, number of rooms, facility quality, and location.
      * Monthly rent price is normally distributed from 500 euros per month to 5000 euros per month.
    - First, immigrants will keep only the options that they can afford (i.e., price).
    - And then, immigrants will match each house with his/her preferences for the other six evaluation categories.
    - If there are multiple house options that match his/her preferences, he/she will choose the cheapest one.
    - As soon as they get rent, their status changed (little concerns about accommodation)
      * They lose the “house seeker” status.
* Buy
  + The process is almost same as rent process, but the price is different.
  + Due to probation policy, immigrants can start buy a house after one year.
  + All three groups (discussed above) can try to buy a house.
  + Assume that the immigrants can have a long-term loan (up to three times of their annual salary over 20 years)

D. Health

* If sick, immigrants cannot make any other action (action point gets to zero automatically.)
* The probability of being sick is determined by disease rate.
* The period of being sick is randomly determined.

E. Hospital

* When sick, immigrants seek to meet a GP.
* But GP access rate is pretty low.
  + When successfully meeting with GP, they can be cured and they are satisfied with the hospital.
  + But if they couldn’t meet with GP, they are dissatisfied with the hospital and medical system.
  + GP access is one of the model parameters we can adjust.

F. Birth & birth care

* Two stages: pre-birth (pregnant) and post-birth periods
* Pregnant period (pre-birth: 280 days)
  + During the pregnant period, immigrants visit Maternity hospital (OB).
  + The immigrants can be satisfied with the quality of birth care with a given probability (this is one of the model parameters we can adjust.: birth care quality)
  + When the immigrants are dissatisfied with the quality of birth care, it would decrease one’s pregnant rate and increase the risk of miscarriage.
* Post-birth period (180 days)
  + If the immigrants have been dissatisfied with the quality of birth care, they do not want to rely on maternity hospital even during the post-birth period.
  + Thus, they would lose some their health points because of lack of support from maternity care system. (the lost health points would come back when post-birth period ends.

G. Child care

* If the immigrants’ company provides child care system to their employees, the immigrants are satisfied with the child care system
* But those without support from their company, they rely on other child care system (public or private)
  + Since they need to pay for the child care system by themselves, their wealth decreases (for public care, 25 euros per day per kid, for private child care, 60 euros per day per kid)

H. Spouse work permit & recognition of prior experience (RPE)

* Four types of agents:
  + 1) Hold G1 stamp & need the recognition of prior experience
  + 2) Hold G1 stamp & do not need the recognition of prior experience to be hired.
  + 3) No G1 stamp & need the recognition of prior experience
  + 4) No G1 stamp & do not need the recognition of prior experience
* Recognition process:
  + Fee (300 euros)
  + Que time = 90 days
  + RPE acceptance rate is one of the model parameters.
* Permit (& being hired)
  + This category covers both the spouses’ job application process (i.e., hiring process) and work permit.
  + Job application process is quite similar to housing process. Immigrants’ spouses are given certain number of available positions and then they are selected from the company with a given chance.
    - The number of available positions is one of the models’ parameter.
  + G1 stamp holders can have a larger number of options than those without G1 stamp. This is because the company doesn’t need to support the visa application if the employee holds G1 stamp; so G1 stamp holders can apply for more positions.
  + The presence of RPE also allows the spouses to apply for more number of positions.
    - Without RPE, the spouses cannot be hired in the position requiring RPE
    - At this moment, due to lack of information and data, I assume that 21 out of 90 positions do not need a specific RPE from the job applicants. These selections are determined by the general probability of being hired, which is also simply estimated as a function of education level and salary. These non-RPE required positions usually have a higher probability of being hired.
  + Job application process:
    - When applying for the positions, spouses are given a certain number of available positions (random sample from the generated dataset on 90 positions)
    - Out of the positions, applicants (spouses) can apply for those with the minimum education level they can meet. That is, education level is a screener. (Spouses’ education levels are generated using the information on visa applicants the DoJ provided to us and normal distribution.)
    - Then, I assume that the spouses apply for all the possible positions; using the generated data on “probability of being hired”, which was estimated by the mean salary and education level for each position, the model makes the hiring decision.
    - If the spouses are selected for multiple positions, then she/he chooses the position with the highest salary. (there is no duplicates in terms of salary in the dataset, so the model can quickly make a decision of selecting employees.
    - Then, applicants submit the application for work-permit, depending on their current positions and visa status.
      * Usually, G1 stamp holders do not need to apply for work permit. But if their G1 stamp will end soon (approximately in six months), I assume that they will apply for the work permit to secure their new position.
      * Probation period is one of the model parameters.

I. Job market again and visa renewal

* Same as spouses’ job application and work-permit
* Probation period is one of the model parameters.
* Once an immigrant is applying, he/she is recognized as “job seeker.” The number of job seekers captured by another agent, “econ\_status”, can have an influence on job market: the level of competition increases.

J. Spending

* Living cost and tax. Both spendings are determined by immigrants’ wealth levels (5 levels: top 5% – top 25% - 50% - 75% - 100% ).

K. Aging

* As time goes by, immigrants’ health points decrease by day.
* Also, immigrants get higher disease rate as they get older.

L. PPSN

* Submission
  + To submit the application, immigrants must have their own address; they have to have a rent or buy a house before getting the PPSN.
  + Que time: 42 days (mean)
* Without this, immigrants should pay more tax. Immigrants without PPSN will receive 60% of their payroll.
* Both immigrants and their spouses can get PPSN as long as they are hired.

M. Residence permit

* Similar process to the PPSN.