7. Sensitivity Analysis

In the module, the result(the user population of a language ,and the order of users population) is determined by population increase, immigrant, trade and Internet. Trades and Internet requires super-parameters, which depends on our experiment. We try these parameters from 0.01 to 10 to test their influence.

Trade often fluctuates with global economy and policy **,however ,** the result of different trade and Internet parameters doesn’t change too much. Some language’s intersection changed . Most language’s final order doesn’t change. Olny Spanish and Arabic’s order change. Under such wide parameter range and little change , we can draw the conclusion that trade’s and Internet’s influence is not significant.

图片20-lans\_order\_num-a-0.001.png：参数 = 0.01

图片20-lans\_order\_num-a-0.001.png：参数 = 10

Population’s influence is significant. We add a random population matrix during each loop ,and at the random range [-1000000 ,1000000],the language order changed. So it’s an appropriate choice to put immigration the natural population growth rate(the tow factors which determine population increase ) into our module.

图片20-lans\_order\_num-rt-10000.png 随机人口变化range [-1000000 ,1000000]