(* read me first)

Part I : notation for the simulation.

[1.] dl is the discount factor delta;

[2.] V[c] is the consumption utility function U[c] in the community;

[3.] Vm[c] is the consumption utility function U_hat[c] in the city;

[4.] R[w] is the investment return function R[w] in both the community and city;

[5.] wbar is the wealth level where the marginal return to investment becomes constant, that is, $R'[w] = 1/\text{delta}$ for any $w \geq$ wbar and $R'[w] > 1/\text{delta}$ for $w <$ wbar;

[6.] cbar is the consumption level where the marginal utility from consumption U'[c] equals 1;

[7.] Rcons[w] is the linear investment return function such that Rcons[w] = R[w] for $w \geq$ wbar;

[8.] what is the wealth level such that R[wbar - cbar] = wbar, which means that the constant consumption sequence {c0, c1, c2 ...} = {cbar, cbar, cbar ...} is feasible if the household ' s initial wealth is wbar;

[9.] the wealth level "w=wthreshold" and an associate consumption c[w] solves the following system of equations : {w - c[w] == wbar, R[w - c[w]] == w}. As a result, if the household has w > wthreshold, it will move to the city, choose a constant consumption sequence, and its consumption level is above cbar;

Part II : the code for the market (this is step three in the simulation nb file)

[1.] we look at the wealth level from zero to wupper = R[R[wthreshold]], and use the grid of 1 / 2000;

[2.] for each wealth level w, we calculate the consumption c[w] such that R[w - c[w]] == w;

[3.] We start from the value function Pi_hat[w] = U_hat[c[w]]. This is the value function if the household with initial wealth w chooses the constant consumption sequence {c0, c1, c2 ...} = {c[w], c[w], c[w] ...}. We use Pm to denote the current value function;

[4.] We start from the value function Pm and generate a new value function Pmplus assuming that the household chooses the optimal consumption and investment given the continuation value function Pm;
We then let Pm equal the newly generated value function Pmplus.

[5.] We repeat the operation in [4.] until the difference between Pm and Pmplus is sufficiently small (i.e., in the "no commitment benchmark.nb" file, the difference is at most 5.961374595171362*^-6)

Part III : the code for the community (this is step four in the simulation nb file)

[1.] for a household in the community, since the marginal cost of returning favor is equal to 1, the household would like to choose the favor level to complement its consumption up to cbar or to choose the maximal favor level that is allowed by the dynamic enforcement constraint. As a result, if monetary payment for consumption is equal to wealth[i], then the favor level is the minimal of cbar - wealth[i] or the level that is allowed by the dynamic enforcement constraint.

[2.] Once we pin down the favor level according to [1.], the remaining iteration operation is the same as Part II.

[3.] the wealth level "wsel" is the selection wealth level at which the household moves to the city.

[4.] the wealth level "wtre" is where the wealth level converges to in the community.

Part IV : the mapping between the simulation files and the figures in the paper.

[1.] [Benchmark case : Figure 1 to Figure 3 in the paper] the "no commitment benchmark.nb" file corresponds to Figure 1, Figure 2, Figure 3 in the paper. The left panel of Figure 1 is given by {"consumecity" (for consumption in the city), "Pmplus" (for value function in the city)}; the right panel of Figure 1 is given by {"wealthseqvalue" (for the wealth sequence in the city), "consumeseqvalue" (for the consumption sequence in the city)}; Figure 2 is given by {"Pmplus" (for the value function in the city), "Psplus" (for the value function in the community)};

Lastly, Figure 3 is the investment level both in the city and in the community. For the investment in the city, the investment level is current wealth level minus the consumption level given by "consumecity". For the investment in the community, the investment level is current wealth level minus the payment level given by "priceupdate".

[2.][better consumption utility function in the city, Figure 4 in the paper] The value function for higher U_hat[c] is given by "Psplus" in the "better consumption utility function in city.nb". The value function for lower U_hat[c] is given by "Psplus" in the "no commitment benchmark.nb".

[3.][better investment return function, Figure 5 in the paper] The value function for higher R[w] is given by "Psplus" in the "better investment.nb". The value function for lower R[w] is given by "Psplus" in the "no commitment benchmark.nb".

[4.] [commitment to community benefit : Figure 6 in the paper] the "community benefit 1 over 512.nb" and "community benefit 1 over 128.nb" correspond to panel II and panel II of Figure 6. The community benefit B is 1 / 512 and 1 / 128, respecitively for panel II and panel III. The only change relative to the "no commitment benchmark.nb" is that we add B to the dynamic enforcement constraint in step four of the simulation. As a result, the household either uses favor to complement its consumption up to cbar or choose the maximal favor level that is allowed by the dynamic enforcement constraint plus B. In both panels, the wealth next period is given by "wealthupdate" in the simulation files.

[5.] [place - based policy, Figure 7 in the paper] If the household stays in the community, it gets an additional utility B = 1 / 250. The simulation file is "place based utility 1 over 250.nb". This corresponds to Figure 7 in the paper. If a household reneges on promised favors, it can either move to the city or it can stay in the community in order to get the place - based utility. In the benchmark case, the second option won ' t be profitable. In the simulation file, step three.half is designed to take care of the second option, so we can get the value function if the household reneges on its promised favor. The value function for the place - based policy case is given by "Psplus" in "place based utility 1 over 250.nb". The value function for the baseline is given by "Psplus" in "no commitment benchmark.nb" (Note that this file is using grid = 1 / 1000, while the benchmark case used grid = 1 / 2000.)

[6.][stochastic return to investment, Figure 8 and Figure 9 in the paper] Given the investment return function R[w] in the "no commitment benchmark.nb", we assume that with probability $1/2$ the return is $(1 + x)$ R[w] and with probability $1/2$ the return is $(1 - x)$ R[w]. "stochastic return 15 percent.nb" corresponds to the case that $x = .15$, and "stochastic return 40 percent" corresponds to the case that $x = .40$. The left panel of each picture is given by the code :

```
ListPlot[
    {wealthupdate, wealth[[1 ;; wsel]], shocka wealthupdate, shockb wealthupdate},
    PlotLegends → {"expected wealth tomorrow", "wealth today",
      "wealth tomorrow highest", "wealth tomorrow lowest"}, AspectRatio → 1];
```

The right panel the investment level both in the city and in the community. For the investment in the city, the investment level is current wealth level minus the consumption level given by "consumecity". For the investment in the community, the investment level is current wealth level minus the payment level given by "priceupdate". (Note that, for the simulation in the city, we make the assumption that when the wealth is very high the shock doesn't occur any more, in order to get the value function for very high wealth levels. Given that this assumption is made only for very high wealth level, we expect that this won't affect the dynamics in the community.)