Lecture 15 – Housing policy

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1 Review of previous lectures

1. Key issues arising from dynamics and durability of housing
   (a) Present value vs. annual cost
      i. Must distinguish between present value of costs or income and annual costs or income.
      ii. Both perspectives are useful. depends on question.
      iii. Relationship between the two perspectives is governed by interest rates.
   (b) Housing is both an investment and a consumption good.
   (c) Perfect capital market with no uncertainty and with all costs proportional to value, relation between value and rent is governed by no arbitrage condition:

$$R = [i + T + m - g]\, V$$

   (d) This relationship holds true in theory but not in data
   (e) Reasons why theoretical relationship is not observed in data
      i. Data on identical rental and owner-occupied properties is not available. Typically, rental properties are different (in quality, location, size, etc.) from owner-occupied properties.
      ii. Formula does not take income taxes into account. See the next section.

iii. Formula ignores transaction costs in housing markets. See below.

iv. Formula ignores uncertainty about future values, growth of values, interest rates.

v. Capital markets are not perfect. Interest rate on borrowing is usually higher than savings. There are limits on amounts that can be borrowed.

2 User cost of capital in presence of income taxes

1. Question: Does the income tax system favour owner-occupied housing or rental housing?

2. Income taxes (US and UK tax law).

   (a) Income taxes affect the user cost of capital because costs and income associated with owning a house impact taxable income and hence impact how much income tax one pays.

   (b) In general, rental housing and owner occupied housing are treated differently.

      i. In both the US and the UK, rental income is not taxed for owner-occupied housing while it is for rental housing.

      ii. In the US, both landlords and homeowners can deduct real estate taxes and mortgage interest from their income.

      iii. In the UK, tenants pay council taxes, these are not deductible from income, and owner occupiers cannot deduct mortgage interest from income.

      iv. Landlords can deduct all maintenance costs from taxes.

      v. Landlords can deduct "depreciation".

      vi. Capital gains are untaxed for most homeowners while they are taxed for rental owners.

3. User cost of owner-occupied housing in US (with income taxes).

   (a) Interest cost $= (i^r + \pi)(1 - t)V$.

i. Suppose buy house and borrow M, pay E where $V = M + E$.

ii. Annual foregone interest is $(i^r + \pi) E (1 - t)$.

iii. Annual mortgage interest is $(i^r + \pi) M$, but reduce taxes by $t (i^r + \pi) M$, net cost is $(i^r + \pi) (1 - t) M$.

(b) Property tax is also deductible for homeowners, property tax cost is $T (1 - t) V$.

(c) Other costs not tax deductible: cV.

(d) Capital gains not taxed: cost $= - (g^r + \pi) V$.

(e) Total user cost of owner-occupied housing in US

$$\begin{aligned} R &= ((i^r + \pi) (1 - t) + T (1 - t) + c - g^r - \pi) V \\ &= ((i^r + T) (1 - t) - \pi t + c - g^r) V. \end{aligned}$$

(f) Higher inflation benefits homeowners because it increases nominal interest rates, which increases nominal interest payments, which lowers taxes. Increased costs due to higher interest payments are offset by increase in value of home.

(g) Higher income taxes lower the user cost of owner occupied housing.

4. User cost of owner-occupied housing in UK (with income taxes).

(a) Interest cost $= (i^r + \pi) V - t (i^r + \pi) E$.

i. Suppose buy house and borrow M, pay E where $V = M + E$.

ii. Annual foregone interest is $(i^r + \pi) E (1 - t)$.

iii. Annual mortgage interest is $(i^r + \pi) M$.

iv. $(i^r + \pi) V - t (i^r + \pi) E$.

(b) Council tax is not deductible, property tax cost is TV.

(c) Other costs not tax deductible: cV.

(d) Capital gains not taxed: cost $= - (g^r + \pi) V$.

(e) Total user cost of owner-occupied housing in UK

$$\begin{aligned} R &= (i^r + \pi + T + c - g^r - \pi) V - t (i^r + \pi) E \\ &= (i^r + T + c - g^r) V - t (i^r + \pi) E. \end{aligned}$$

(f) Higher inflation lowers user cost of homeowners in UK because foregone interest is lower when nominal interest rates are high due to high inflation.

(g) Higher income taxes lower the user cost of homeownership because it lowers the opportunity cost of foregone interest.

5. Equilibrium rent for rental property in US (with income taxes).

(a) Landlord charges rent so that earns zero profits (competitive market assumption).

(b) Landlord is allowed to deduct dV from taxable income. d is the depreciation rate for tax purposes.

(c) Zero profit condition for landlord is

$$\begin{aligned} \textit{income} &= \text{direct costs } + \text{ indirect costs + income taxes} \\ R + g^r V &= i^r M + (T + c) V \ + i^r (V - M) + \text{income taxes} \\ R + g^r V &= (i^r + T + c) V + \text{income taxes} \\ \text{income taxes} &= t \left(R + (g^r + \pi) V - (i^r + \pi) V - (T + c) V - dV \right) \end{aligned}$$

$$\begin{aligned} R + g^r V &= (i^r + T + c) V + t \left(R + (g^r + \pi) V - (i^r + \pi) V - (T + c) V - dV \right) \\ R (1 - t) &= V (i^r + T + c - g^r) (1 - t) - tdV \\ R &= V (i^r + T + c - g^r) - \frac{t}{1 - t} dV. \end{aligned}$$

6. Assumes i, T, c, g, and t are same for both owner-occupiers and owner-landlords.

(a) Suppose $\pi = d = 0$

$$\begin{aligned} R_R &= ((i_R + T) (1 - t) + c_R - g_R) V. \\ R_O &= (i_O + T + c_O - g_O) V. \end{aligned}$$

(b) $c_R > c_O$ then $R_R > R_O$, in which case it is better to own.

(c) $g_O > g_R$ then $R_R > R_O$ better to own.

3 Equilibrium values of rent and value

1. Studied user cost owner occupied housing.

2. Competitive market rent.

3. In a perfectly functioning capital market, constant rents, no uncertainty, no income taxes, no transaction costs, prices adjust instantaneously

$$R = (i + T + c - g)\, V.$$

   (a) If value rises and rent does not everyone is better off renting than buying. That will drive the rent up and the value down.

   (b) If rent rises and value does not, everyone is better off buying than renting driving value up and rent down.

   (c) Look at picture. Rent and value don't move together in short run.

   (d) Short run, costs of moving, buying/selling, multiple types of housing, the above relationships may not hold in short run.

   (e) If you are owner-occupier and there are moving costs, if rent for equivalent property falls you may not switch to renting because of moving costs. Or, if the value of property is high now and you know it will fall in one year's time, you may not sell because of moving costs.

4 Rent vs. buy with transaction costs

1. Transaction costs.

   (a) Financial and time costs of search.

   (b) Cost of physically moving durable goods.

   (c) Legal and realtor fees.

   (d) Stamp duty.

   (e) Higher for buying/selling than for renting.

2. Decision whether to buy or rent depends on length of stay. If expect to stay longer, it is better to buy.

3. If expect to stay T years, must compare total cost of renting over T years to total costs of owning.

4. User costs not as simple to calculate when there are transaction costs.

5. Example.

   (a) Suppose you plan to stay in a flat for 2 years.

   (b) Cost of owning for 2 years and then moving is

$$\begin{array}{cccc} & 0 & 1 & 2 \\ C^O = & \left(V_0 + m_0^B + c_0^O\right) + & \frac{c_1^O}{1+r} + & -\frac{\left(V_2 - m^S\right)}{(1+r)^2} \end{array}$$

   where

$$c_0^O = (T + c)\, V_0$$
$$c_1^O = (T + c)\, V_1$$

   (c) Cost of renting is

$$\begin{array}{cccc} & 0 & 1 & 2 \\ C^R = & m_0^R + R_0 + & \frac{R_1}{1+r} + & \frac{m_2^R}{(1+r)^2} \end{array}$$

6. Own if

$$C_0 < C^R.$$

7. Transaction cost is the fixed cost of living somewhere. The rent or the "user cost" is the marginal cost. If you are going to consumer the services of a flat for a long enough period of time, it makes senses to incur a high fixed cost and then pay the low marginal cost of ownership (assuming the marginal cost of an additional year in a flat is lower if owning then if renting). If you are only going to consume the services for a short period of time, then it may make sense to rent, at a high marginal cost, and pay a low fixed cost.

8. This tradeoff between fixed costs and marginal costs is obvious. We face decisions like this everyday. However, it is important to remember that the "classical" housing demand model assumes that fixed costs are nil. Thus, the classical model rules out the tradeoff between fixed costs and marginal costs. The classical model is useful because it is easy to

analyse and makes clear the intertemporal determinants of value (i.e. net present value of future rents) and because as a rough approximation it is not bad in some circumstances. However, when analysing short run decisions between buying and renting, for example, transaction costs are important determinants of people's choices between renting and buying.