

Chapter 3 • The Market You Live In

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Chapter 1 promised a first model built by hand: small enough to run on paper, with agents whose behaviour you can recognise. Chapter 2 ended with a question the laboratory alone could not answer. What happens to fairness when people trade in a market, rather than divide a sum of money between two strangers? This chapter builds that model, for a market most readers know from the inside: students arriving at a university and looking for rooms to rent.

The chapter is also a test. Economists defend the unrealistic assumptions of their models with an argument made famous by Milton Friedman in 1953: assumptions need not be realistic, so long as the model predicts well. Behind that defence sits an empirical claim, rarely stated and almost never tested. It is the claim that the model's conclusions would survive if the missing realism were put back. In this chapter we put some of it back, and watch what happens to the conclusions.

1. Where did you last bargain?

Think back over the last week. Where did you bargain over a price?

Probably nowhere. At the supermarket the price is on the shelf. The bus fare is fixed, the coffee is on the board, and the tuition is on the university's website. The seller names the price, and you take it or leave it. Economists call this a **posted price**, and it is the most common way of buying and selling in the world.

Housing works the same way. A landlord advertises a room at a rent, in a newspaper, on a website or in a student housing group. Students read the listings, phone, visit, and take a room or keep looking. There may be a little haggling at the end, but the starting point is a number someone chose and wrote down.

Now open a standard microeconomics textbook at the chapter on supply and demand. You will find curves, an equilibrium, and one price at which everyone trades. You will not find anyone who writes the price down. In the competitive model every buyer and every seller is a **price-taker**: each treats the market price as given, and nobody sets it. Price-setting firms do appear later, in the chapters on monopoly and imperfect competition, but as departures from the competitive benchmark. The institution in which you buy almost everything is treated as the exception.

Before reading on. Write down how you found the room you live in now, or the last one you looked for. Was the rent posted, and did anyone bargain over it? Do friends in similar rooms pay different rents? Then make a prediction. Five students arrive in a town with four identical rooms to let, and the student with the largest budget could pay more than any owner needs. Will she certainly get a room? Keep your answers; section 6 returns to them.

2. The textbook's market

Hal Varian opens *Intermediate Microeconomics* with a market for apartments in a university town. We build a version of it small enough to hold in your head: five students and four houses. All rents are in thousands of lira a month, so a budget of 15 means 15,000 lira.

Each student has a **budget**: the most she can pay for a room. We call the students A, B, C, D and E, and their budgets are 5, 10, 15, 20 and 25. Each house has an owner with a **minimum acceptable rent**: the least he will take. The four owners' minimums are 5, 10, 15 and 20. The four houses are identical.

The textbook turns these numbers into two schedules. For any rent, the **demand schedule** counts the students whose budgets reach it, and the **supply schedule** counts the owners whose minimums it meets.

Rent	Students who want a room	Owners willing to let
5	5	1
10	4	2
15	3	3
20	2	4
25	1	4

Between the rows the counts stay the same. At a rent of 12, for example, three students want a room and two owners will let. Drawn on a graph, the two schedules are staircases, one falling and one rising.

At 15, and only at 15, the number of students who want a room equals the number of rooms on offer. Below 15 there are more students than rooms; above it, more rooms than students. So the textbook predicts:

- every house that is let rents at 15;
- C, D and E are housed, while A and B cannot pay 15 and are not;
- the owners asking 5, 10 and 15 let their houses, and the owner who needs 20 does not.

Two features of this prediction will matter. First, it is **one price for everyone**. The owner who would have accepted 5 receives 15, and so does the owner who needed exactly 15. Second, **everyone willing to pay the market price is housed**. Those left out are left out by the price itself, and by nothing else.

A note for readers who check Varian. Varian holds the number of apartments fixed, so his supply curve is a vertical line. We give the owners different minimum rents instead. That produces the upward-sloping supply curve drawn in every principles textbook, and the logic of equilibrium is unchanged.

Where did the people go?

Look at the staircases again. Each step is a person: a student with a budget, or an owner with a need. Once the steps are smoothed into curves, as textbooks usually draw them, the people disappear. What is left is two lines and the point where they cross. Nothing in the picture says who these people are, what they know, or how they meet.

Why identical houses?

Real houses differ in size, light, noise and distance from the campus. Varian sets this aside, and we follow him so that the comparison is fair. But notice what the assumption protects. Competition needs many sellers of the same good. If every house is different, each is a small market of its own, and the argument

for one competitive price loses its footing. The posted-price model of section 4 does not need identical houses. We keep them only to make the comparison clean.

3. Where does 15 come from?

The textbook tells us that the rent will be 15. It does not tell us how anyone arrives at 15. Who first says the number? How do five students and four owners, each knowing only their own budget or need, find the one rent at which their numbers match?

The auctioneer

One story produces 15, and it has a name: the **Walrasian auctioneer**, named after the economist Léon Walras. Put all nine people in a room with a teacher at the front. The teacher calls out a rent and asks for hands.

- At 5, five students raise their hands and one owner does. There are more students than rooms, so the teacher raises the rent.
- At 10, four students and two owners. Still more students than rooms, so he raises it again.
- At 15, three and three. The numbers match, contracts are signed at 15, and the market closes.

Nobody trades until the teacher stops. Had he called a rent with more rooms than students, he would have lowered it.

This is a complete model. Every agent and every step is written down, and you could run it in class in five minutes. In the language of Chapter 1, it is our first agent-based model, and it reproduces the textbook's prediction exactly.

It is also a market nobody has ever seen. No rental market has a teacher at the front calling out rents while everyone waits. By the plausibility test of Chapter 1, section 9, the model fails at once: its mechanism looks nothing like the way rooms are actually let. The nominalist is not troubled. On his criterion only the prediction counts, and how the model reaches it is the model's private business. That is precisely the attitude this book rejects.

The law of one price

The auctioneer's market has one price because one person announces it. Textbooks more often justify one price through the **law of one price**: identical goods must sell at the same price. When I ask students why, they find the question strange. It seems obvious.

Work out what it requires. Suppose the four houses were advertised at four different rents. For the rents to become equal:

- every student must know every rent, and be able to reach every house at no cost;
- every student must head for the cheapest house;
- the owner of the cheapest house, finding five students at his door, must be free to raise his rent until some of them leave for the next house; and
- a deal already struck must be breakable when a better offer arrives.

Run that process and the rents climb toward one another, until no student can do better by moving. Remove any one condition and the process stops. The last two matter most here. They are institutional

rules: who may change a price, and whether an agreement is final. Chapter 1 listed exactly these as rules an agent-based model must write down. Under posted prices and signed leases, neither holds.

Friedman's defence

At this point the textbook has a defence ready. All models simplify, and the auctioneer is only a device. Milton Friedman gave this defence its classic form: a model should be judged by its predictions, not by the realism of its assumptions.

Taken at face value, this is the nominalist criterion of Chapter 1. But it contains a hidden empirical claim. To call the auctioneer a harmless device is to say that a realistic market process would lead to the same place. That claim can be tested. Build the market as it actually works, run it, and compare the result with 15. The rest of this chapter does that.

4. Building the posted-price model

We keep the same nine people, with the same budgets and minimums. We change only the rules of meeting and trading, to match the rental market students actually use. Here is the whole model.

The rule card

1. **Advertising.** Each owner advertises his room in the morning paper, at a rent of his own choosing, never below his minimum. Ads are written before the paper appears, so no owner sees the others' rents while choosing his own.
2. **Calling.** Students read the paper and phone owners, one at a time. Each calls the cheapest room she can afford. The rent is as advertised, with no bargaining, and the first caller to reach an owner gets the room.
3. **Finality.** A signed contract holds for the year. The owner cannot let the room to someone else, and the student cannot walk away.
4. **Re-advertising.** An owner whose room is still empty at the end of the day advertises again the next morning, 5 lower, but never below his minimum.
5. **Closing.** The market ends when no further deal is possible.

One day is one edition of the paper. Everything happens within a single September, with this year's students and this year's houses.

Your grandparents read such ads in newspapers; you read them on a website or in a housing group. The technology changes, but the institution does not. Sellers post, buyers search and make contact, and the price is take it or leave it.

The rule card makes choices the textbook never has to make. **Information** is one. Here everyone sees every ad, because everyone reads the same paper. In class we also considered a market with no paper, in which students walk the streets and come upon houses in no particular order, knowing only what they find. That is a different market, and you will build it in the exercises. **Finality** is another choice. It reflects the law, and ordinary honesty: in most places a landlord cannot evict a tenant because someone else offers more. The next chapter asks what a market would look like without it.

Where do posted rents come from?

In the textbook, the price comes from the curves. Here each rent must come from a person, and no two people think alike. Here are our four owners.

Owner	Minimum	Advertises	Who he is
The speculator	5	15	Inherited the house and needs little from it. "Students are desperate; aim high."
The retired teacher	10	10	Needs 10 to live on and asks no more. "What they save can go on books."
The rule-of-thumb landlord	15	18	Adds a fifth to his costs, as his father always did.
The tester	20	30	Comfortable and in no hurry. "Let's see if someone pays. If not, who cares?"

Nobody in this market knows the equilibrium rent, and nobody has seen a supply curve. Each owner sets his rent from his own needs, habits, hopes and conscience, and each answers for the number he writes down. That is the plain meaning of a posted price. It is also the first thing the model forces us to say that the textbook leaves unsaid.

Who calls first?

The students are people too. Rule 2 needs an order of calling, and the order cannot be left blank.

Student	Budget	Situation	Calls
A	5	A scholarship that barely covers food; she has not slept for worry.	First, at dawn
B	10	Works evening shifts and needs this settled today.	Second
C	15	Modest support from her family; anxious but managing.	Third

Student	Budget	Situation	Calls
D	20	Comfortable; wants it done this week.	Fourth
E	25	Wealthy. "Just find something nice," said her father.	Last, before lunch

Our rule is that **anxiety sets the order**: the fewer rooms you can afford, the earlier you are on the phone. When this market was first run in class, a student objected that the rich student might simply be lazy. That is exactly why the rule is written down. It is a hypothesis about people, open to challenge, and section 6 changes it to see how much depends on it.

5. Running the market by hand

Take a sheet of paper and run the market yourself before reading the account below. It takes about five minutes.

Day 1. The morning paper lists four rooms, at 10, 15, 18 and 30.

- **A (budget 5)** is up at dawn with the paper. The cheapest room is 10, twice her budget, so she finds nothing. Being early cannot fix being poor.
- **B (10)** calls next. The cheapest room is the teacher's, at 10: exactly his budget. He takes it. B has a home today because one owner chose not to squeeze. Had the teacher advertised like the speculator, B would still be searching.
- **C (15)** calls the cheapest room left, the speculator's at 15, and takes it. The speculator aimed high and still let his room, because everything cheaper was gone.
- **D (20)** finds the rule-of-thumb landlord's room at 18 and takes it.
- **E (25)**, last out of bed, finds only the tester's room at 30. It is above her budget, so she finds nothing today.

Day 2. One ad appears in the paper. The tester's phone stayed silent, and he now asks 25. A reads the paper at dawn, but 25 is far out of reach. E calls and takes the room at 25, her whole budget.

The end. No deal remains possible. A cannot afford anything, and every room is let, so the market closes.

Student	Budget	Rents from	Rent paid	Day
A	5	No one	—	—
B	10	The retired teacher	10	1
C	15	The speculator	15	1
D	20	The rule-of-thumb landlord	18	1

Student	Budget	Rents from	Rent paid	Day
E	25	The tester	25	2

Four students are housed, at four different rents: 10, 15, 18 and 25. One student is not housed, and no room stands empty.

6. Two markets side by side

We have the same nine people, with the same budgets and the same minimums. Only the rules of meeting and trading have changed.

	Textbook equilibrium	Posted prices, anxious students first
Rents	One rent: 15	Four rents: 10, 15, 18, 25
Students housed	3 (C, D, E)	4 (B, C, D, E)
Who is housed	Decided by budget alone	Decided by budget, timing and the owners' choices
The owner who needs 20	Keeps an empty house	Lets it at 25
How it happens	No process given	Two days of ads, calls and one rent cut

Look more closely at who got what.

- **The richer students paid more.** D pays 18 and E pays 25, both above the textbook's 15. Their contracts are final, and no later offer can bring their rents down.
- **Two of the textbook's losers traded.** In equilibrium, B is priced out and the tester's house stands empty. Here both find a deal.
- **Character changed the outcome.** B is housed because of the teacher's fair rent, and for no other reason.
- **A is excluded in both markets, but differently.** In the textbook, A is excluded silently, by the price. Here she is excluded by a person. Had the speculator advertised at his minimum of 5, A would have taken his room at dawn. C would then have found the cheapest room left at 18, and been shut out instead. With five students and four rooms someone is always left out, but which one is decided by the owners' choices.

Now turn back to your prediction from section 1. In this run, the student with the largest budget was housed, but only on the second day, and at the highest rent in the market.

What holds, and what depends on the rules

A single run proves little. The order of calling was a hypothesis, so we change it.

The rich call first. Perhaps the rich have more free time, better connections, or an agent who calls for them. Suppose E calls first, then D, C, B and A. E calls the cheapest room she can afford, which is the

teacher's, at 10. D takes the speculator's room at 15. C cannot afford 18, and finds nothing on day 1. On day 2 the rule-of-thumb landlord cuts to 15, his minimum, and C takes his room. B and A never find a room, and the tester's house stays empty at his floor of 20.

Now the housed students are exactly the textbook's C, D and E, and the owners who let are exactly the textbook's three. But the rents are 10, 15 and 15, not 15 for all. And the teacher's fair rent, meant for a student who could put the saving toward books, went to the richest student in town.

The order is random. In the laboratory experiments discussed in section 7, buyers are called in random order. To compare like with like, we run the market for every possible calling order of the five students. There are 120 of them. That is too many to run by hand, but the rules are simple enough for a short computer program, or for a class working in groups.

Result	Calling orders, out of 120
Identical houses let at different rents	120
Every house let at 15, as the textbook predicts	0
Three students housed	110
Four students housed	10
The housed students are exactly C, D and E	90
B is housed	30
A is housed	0

What the model predicts. Two results hold under every order: identical houses rent at different prices, and the textbook's single rent never appears. The rest depends on who calls first. With random calling, the number housed is usually the textbook's three, and usually the same three students. With the anxious poor calling first, one more student finds a home, and whether that student is B depends on the teacher. A is never housed, under any order, because no owner advertises a rent she can pay.

This is less dramatic than the run in section 5, and more useful. The textbook's prediction about prices fails whatever people do. Its prediction about who is housed survives or fails depending on a rule about people. That rule cannot be settled by arithmetic. It must be judged by asking whether it is plausible, which is the business of the next section.

7. Judging the two models

We now have two models of the same nine people. The auctioneer reproduces the textbook's prediction by construction, and the posted-price model produces something else. Chapter 1, section 9, set out the questions for judging a model built for understanding. Does it reproduce what we observe? Are its mechanisms plausible? Has its simplification kept what matters? We take them in turn.

Reproduction: what we see in rental markets

Start with what everyone who has rented a room knows.

- Similar rooms rent at different rents. Two friends in similar flats on the same street rarely pay the same.
- A sitting tenant cannot be outbid. A student who signed in September at a low rent keeps her room, however much a newcomer would pay.
- Students with money sometimes search for days and find nothing suitable, while other rooms sit empty at rents nobody will pay.
- Contracts hold for the year, and rents change mostly when a lease is renewed.

The posted-price model produces each of these, and the textbook equilibrium produces none of them. Its defenders do not deny the facts. They say the facts are temporary: leases expire, and next year the market will move toward equilibrium. We return to that defence at the end of this section.

Reproduction: what the group has found

Chapter 1 asked us to take our models to the widest group we can reach. For posted prices, that group includes several decades of laboratory experiments. Buyers and sellers are given values and costs, as our students have budgets and our owners minimums. Sellers post prices, take it or leave it, and buyers are drawn from a waiting queue in random order to shop. That is why section 6 ran the model with random calling: it is the version to set beside the laboratory.

Two findings matter here. The first is that posted-offer markets behave very differently from markets in which both sides bargain openly. Compared with double auctions, like the oral double auction described in Chapter 1, section 8, prices in posted-offer markets move toward the textbook equilibrium more slowly and less completely (Plott and Smith 1978; Ketcham, Smith and Williams 1984). The institution changes the outcome, which is the claim this chapter has been making.

The second concerns the first trading period of each session. It is the only period in which sellers have no history to learn from, which is the situation of every landlord facing a new cohort of students each September. Douglas Davis and Charles Holt (1997) chart four of their posted-offer sessions period by period. In each, the textbook predicts that five units will trade in the first period.

Session (Davis and Holt 1997)	Units the textbook predicts	Units traded in period 1
Standard posted offer	5	0
Sellers may grant discounts	5	1
Sellers may post a second price	5	0
Sellers told of unmet demand	5	0

In three of the four sessions, nothing traded at all. Inexperienced sellers posted prices above what any buyer would pay.

Set this beside our model and the match is partial. Our tester overshoots in just this way, but the other three owners do not, and in the model most rooms are let on the first day. The laboratory says that sellers with no experience nearly all aim too high. Part of the difference is what sellers know. A laboratory seller knows his own costs and nothing about the buyers, while a landlord has neighbours, agents and last year's rents. A partial match is still useful, because it shows where the model's rules need

evidence: here, about what owners know when they write their ads. Exercise 5 asks you to run the model with owners who know as little as laboratory sellers.

One more laboratory result bears on our rules. In one of Davis and Holt's treatments, sellers with unsold units could post a second, lower price within the same period. That is our rule 4, the daily cut. Sellers used it to sell units left over when their prices had been too high, but prices still failed to follow the equilibrium.

Mechanism: what a landlord can learn

The experimenters explain their results not with curves but with what sellers can know. In a posted-offer market, a seller learns almost nothing from trading. A unit left unsold says the price was too high, but not by how much. A quick sale might mean the price was right, or far too low. Davis and Holt asked their sellers whether information about unmet demand had helped. The sellers said it told them whether to raise their price, but not by how much, and their adjustments were cautious.

Put this in our market. An owner whose room is still empty after a week does not know whether his rent is too high, or whether the right student has not yet called. An owner who lets on the first morning does not know whether he could have asked more. And a landlord learns once a year. A laboratory seller gets fifteen rounds in an afternoon. A landlord would need fifteen years to gather the same experience, and each year the students, their budgets and the houses would have changed.

This is a realist explanation, offered by the experimenters themselves. It is a claim about what goes on inside the sellers, which produces what the experiment records. It is also exactly the kind of thing an agent-based model writes down as a rule. Rule 4 says an owner with an empty room cuts by 5. The evidence says owners do cut, cautiously, without knowing how much is right. How large the cut should be is a genuine open question, and the exercises ask you to vary it.

Plausibility: the mechanisms

Chapter 1's rule for plausibility is to test a mechanism on yourself first, and then against collective experience.

- The auctioneer fails this test immediately. Nobody has ever met him.
- The newspaper and the telephone pass it, and so do the first-come rule and the final contract.
- Owners who choose their rents from their own situations pass it. A market in which every owner posts exactly his minimum, as in the simpler version first run in class, does not: few landlords ask only what they need.
- The calling order is the weakest link, and the one most worth testing. Do anxious students really call first? Ask the people around you how they found their rooms.

Plausibility: fairness

One feature of the model needs defending. Four identical houses rent at four different prices. Would people accept that?

In class I asked students to imagine a different case. The university owns four identical hostel rooms, side by side, and prices them at 10, 15, 18 and 25. What would happen? Once the students saw it, the answer

was obvious: they would march to the rector's office. The same room, and my friend pays 10 while I pay 25? Nobody would accept it.

Yet nobody marches when four different landlords ask four different rents. The difference lies in who sets the prices, and why. Daniel Kahneman, Jack Knetsch and Richard Thaler (1986) asked people to judge pricing decisions. One question described a hardware store that raises the price of snow shovels from \$15 to \$20 on the morning after a large snowstorm. Of those asked, 82 percent called it unfair. From many such questions the authors drew a principle they called **dual entitlement**: a seller may raise prices to cover higher costs, but not to exploit a surge in demand.

Thaler (1985) asked a related question. You are on a hot beach, longing for something cold to drink, and a friend offers to fetch it. How much would you pay? People named a much higher price when the drink was to come from a fancy resort hotel than from a small, run-down grocery store, though the drink was the same and would be drunk on the same beach. The original question concerned a beer; in class I tell it with a cold Coke, from a broken-down beach shack and from a luxury restaurant. Thaler read the result as people's sense of a reasonable price for that particular seller. In class, many students went further and said they would refuse the shack's price altogether, thirsty or not.

All three cases make the point of Chapter 2, section 7. People do not judge a price only by its size. They judge what it reveals about the person who set it. A university that charges four rents for one kind of room reveals an intention nobody can defend. Four owners in four different situations do not. Our posted-price market, with its scattered rents, is plausible because the rents come from different people, each with reasons others can recognise.

Sufficiency: what five and four leave out

The model leaves out a great deal: rooms of different sizes and locations, students who haggle over the posted rent, agents who charge fees, deposits, guarantors, and friends who share. Has the simplification thrown out the baby with the bathwater?

The test is whether putting any of these back would bring back the textbook's result. None of them would. Different rooms make one price less likely, not more. Haggling over a posted rent gives each pair its own price. Agents and deposits make searching costlier, and so make the first room found more likely to be taken. What the textbook result needs is the auctioneer, or the freedom to break contracts for better offers, and nothing in a real rental market supplies either.

Two defences, deferred

Two defences of the textbook remain. Both deserve more than a paragraph, and each has a later chapter of its own.

The first is that **the market will adjust next year**. Leases expire, owners learn, and rents drift toward equilibrium. Laboratory markets repeated many times with the same values and costs do move toward equilibrium, slowly. But next September is not this September run again. There are new students with new budgets, new houses, and new prices for everything else.

The second is that **the textbook outcome is efficient**: housing the students who can pay most creates the greatest gain from trade. That claim rests on a way of measuring welfare that counts a student who goes without a room as losing nothing.

Neither defence changes what we have found. In the market students actually use, the textbook's single rent does not appear.

8. Prices have authors

In the competitive model everyone is a price-taker. Prices arrive from the market like the weather, and nobody sets them. It follows that nobody answers for them.

The posted-price model gives prices authors. The teacher and the speculator face the same market, with the same students, under the same rules. They choose differently, and their choices decide who sleeps indoors: the teacher's rent houses B, and the speculator's rent shuts out A. Chapter 2 showed that people respond to the intention behind an offer. Here intentions are not only judged by others; they shape the outcome directly.

But intentions are not the whole story. When the rich called first, the teacher's fair rent went to E, the richest student, who did not need it. A good intention passed through an institution and landed where its author never meant it to. Who receives the benefit of a fair price depends on the rules of meeting and trading, as much as on the person who sets it.

The hostel that doubles up

A third kind of owner is worth meeting, and I have seen one at work. At a university with student hostels, in years when more students arrived than anyone had expected, the university's aim was to house its students, not to earn the highest rent. Its rooms were identical and priced alike. As the thought experiment in section 7 showed, it could not charge different students different rents for the same room.

What did it do? It did not raise the rent until some students gave up. It asked pairs of students to share a room, and charged each of them less.

Put this in our numbers. Suppose the hostel's rent is 5, which every one of our five students can afford, and there are four rooms. The textbook sees a shortage: five students want rooms at 5, and only four exist. Its remedy is to raise the rent until demand falls to four, which shuts out A, the poorest. Varian treats a rent held below equilibrium as rent control, which produces a shortage and an inefficient allocation. The university resolved the same situation another way. Two students shared a room at a discount, and all five were housed.

Three things happened here that the textbook does not foresee. Demand exceeded supply, yet the price fell for two students instead of rising for all. Supply responded, but by changing the thing supplied: four rooms became five places. And the seller's aim was not the highest rent, but housing students. The supply curve has no room for any of this, because it assumes that the unit being sold is fixed by nature. Here the unit is a decision, made by people with a purpose. Exercise 7 asks you to write the university's rule.

Market rules as moral matters

The Islamic tradition has long treated the rules of the market, and not only the conduct of traders, as a moral matter. The Prophet ﷺ forbade *najash*: bidding up a price with no intention to buy, which deceives other buyers about what the market will bear. He forbade going out to meet the caravans before they reached the market, where traders could buy cheaply from sellers who did not yet know the

prices. And his own supervision of the market of Madinah is remembered as the origin of *hisbah*, the office charged with keeping weights honest and dealings fair.

Each of these is a judgement about institutions: who may know what, who may speak for a price, and where trade may happen. Each rests on the recognition this chapter reached by running a model. Change the rules of meeting and trading, and you change who is housed, who is excluded, and who pays more. Our rule 3, that a signed contract holds, has the same roots: Surah al-Ma'idah opens with the command to fulfil your contracts (5:1). The next chapter builds the market the textbook needs, in which contracts can be broken freely, and asks whether any real market works that way.

9. Looking ahead

The posted-price market did not reach 15, and we can now say exactly why. Set it beside the auctioneer's market, and beside the conditions behind the law of one price in section 3. To produce a single rent of 15 from our nine people, a market would need:

- **public offers**, so that every student knows every rent and every owner knows every bid;
- **competitive bidding**, so that a student can offer more for a room someone else has taken;
- **tentative contracts**, which are not final until the whole market closes; and
- **costless renegotiation**, so that an owner can drop one tenant for another, and a student one room for a cheaper one, without cost or shame.

The newspaper gives us the first of these, and nothing else. The next chapter adds the others to the posted-price model one at a time, runs it again, and watches the rents move toward 15. Then it asks the question this chapter has prepared: does any market you know work like that?

10. Open questions and exercises

Three questions remain open. Which calling order best describes how students actually find rooms? Do landlords set rents the way our four owners do, or in ways we have not imagined? And when a student like A goes without a room, is that a failure of the market or simply its working? The first two can be answered by asking people. The third returns in a later chapter.

Exercises

1. **Your own market.** Write down, as a rule card like the one in section 4, how you or a friend found a room. Which rules differ from ours? Run our five students and four owners under your rules.
2. **Who calls first.** Run the market with the rich calling first, and then with an order chosen by rolling a die. Check your results against section 6. Then argue for the calling rule you find most plausible, and test it against the experience of three people you know.
3. **All teachers, all speculators.** Run the market with every owner advertising at his minimum, as the teacher does. Then run it with every owner adding 10 to his minimum, as the speculator does. Who is housed in each market, and at what rents? In which market would you rather be a student, and in which an owner?
4. **The fair speculator.** The speculator advertises at his minimum of 5, and everything else is unchanged. Who is housed now, and who is left out? What does this tell you about whether A's exclusion in section 5 is a matter of poverty or of choices?

5. **Owners who know nothing.** Laboratory sellers in their first period know nothing about the buyers, and most post prices no buyer will pay. Run our market with every owner advertising at 30 on day 1, and cutting by 5 each day his room stays empty. When several rooms are tied at the cheapest rent, the student picks one at random; try at least two ways of breaking ties. How many days pass before the first room is let? Who is housed, and at what rents? Compare your results with section 7.
6. **The landlord who comes down.** In one of Davis and Holt's treatments, sellers could offer a buyer a discount from the posted price. Suppose each owner will take 2 off if a student asks. Write a rule for which students ask, and run the market. Does anything change? Does it matter that in many places, Istanbul among them, some bargaining over an advertised rent is normal?
7. **The hostel.** The hostel's rent is 5, every student can afford it, and there are four rooms for five students. First, work out what the textbook would advise, and who would be excluded. Then write the university's rule for doubling up: who is asked to share (volunteers, friends, the last to arrive, or those with the smallest budgets), and how large the discount is. Is it fair to ask the poorest students to share? Would a discount make it fair?
8. **No newspaper.** The students do not read a paper. Each walks the streets and comes upon the four houses in a random order, taking the first she can afford. How does this market differ from the newspaper market? Who gains and who loses from the lack of information?
9. **Take it to the group.** Interview a landlord, or someone who has let a room. How did she decide the rent? What did she do when the room stayed empty? What would she do if someone offered more after she had signed with a tenant? Compare your answers with those of others in your class, and decide which of our four owners she resembles, if any.

Further reading

The lecture on which this chapter is based is listed on the [course homepage](#), for readers who prefer to watch the model built in class. It covers the same ground, and is optional.

Works cited

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