4.1 The university student housing lottery in the USA: A peculiar institution?

4.1.1 Description: what is it, where

4.1.2 Analysis: what economists have said about it

4.1.3 Identifying the economic design features

4.1.4 Conclusion

4.1.1 Description: what is it, where

Examples of universities which use a lottery as part of their student housing allocation procedure are mentioned (in a footnote) in a paper by Abdulkadiroglu and Sonmez (1998) (A&S). They identify: graduate housing in Stanford University, University of Michigan, and University of Rochester; undergraduate housing at Carnegie Mellon University were allocated by a lottery mechanism. In an earlier paper, Hylland and Zeckhauser (1979)(H&Z) were especially interested in this procedure, because of its introduction in their own university – Harvard. They describe in some detail, again in a footnote, the introduction of a housing allocation lottery for students in the 1970's. There had been problems because of strategic behaviour by some students, which H&Z tried to resolve by designing an alternative lottery-based allocation mechanism (details in the next section) Sacerdote (2000) drew on the lottery allocation at his own university, Dartmouth, to examine the effect of peer pressure. He explained that "As part of a policy change in 1993, incoming freshmen are assigned to dorms and roommates randomly". He then gives a detailed explanation of the mechanics of the system. This is a purely random allocation system. Neither merit nor student preference plays any part in the allocation, nor can students swop afterwards. Sacerdote is one of a growing body of economists (Levitt, Zimmerman, Williams, Hoxby) who are using the 'natural experiment' of lottery allocation as a more powerful way of identifying the effects of interventions such as mixing students of differing ability, desegregation, awarding vouchers for educational choice

Sacerdote, Bruce (2000) Peer effects with random assignments: Results for Dartmouth roommates Social Science Research Network Electronic Paper Collection: http://papers.ssrn.com/paper.taf?abstract_id=203071 also in Qly J of Econ

In order to find out more about the use of the lottery in allocating students to housing at American universities, I ran a Google search (18th March 2004) on "university housing lottery". This produced 130,000 results which had all three words. On the first three pages I found examples of lottery-based student housing allocation at universities such as:

> Stanford, Pacific-Oregon, Rowan-NewJersey, Clark-Massachusets, Souteast-Missouri, west Florida, Quincy-Illinois, Butler, Scranton, Furman, Brown, Dennison, Connecticut, New Hampshire, Actors New School NY, Binghampton, De Pauw, Dayton, John Hopkins, Wesleyan-Illinois, San Jose, Harvard, Tufts. (all of these are in the USA)

So it seems that using a lottery to allocate student housing in America is quite normal and widespread. As a further check I looked at some specific locations – Seattle, Spokane, Denver and Salt Lake City, which I intended to visit shortly. In all four cities I found that universities are using a lottery as part of their student housing allocation process.

From this it seems clear that using a lottery to allocate student housing is very widely used in American universities. A similar search restricted to Canada found a few examples (Guelph-Humber, Queen's Ontario, Victoria), but only after extensive searching. Neither Australia nor the U.K. produced any results. So the use of a lottery in student housing allocations, it seems, is largely confined to North America, especially the United States. The description 'lottery' is generally used, although some instances of 'random selection' can be found, for example at Vanderbilt.

To better understand the actual process of allocating student housing using a lottery, I would like to produce some primary evidence. This consists of two articles from students own newspapers relating to the experience of lottery allocation, together with two extracts from the instructions given to students explaining how the process works. All four come from the internet sites of the universities involved, which is how they would normally be encountered by the student-customers.

Example 1: Comment in students' newspaper: Brown

Example 2: Instructions to students: Rowan

Example 3: Instructions to students: Chicago

Example 4: Comment in students' newspaper: Binghampton

Example 1: Comment in students' newspaper: Brown

A broader view, which casts some doubt about students' feelings on the lottery when used at Ivy League universities is given in the following article: It also contains a lot of useful comparative information about other Ivy League university housing allocation lotteries

University housing lottery similar to other Ivys

By Lotem Almog

With Brown's housing lottery just around the corner, many students are beginning to feel the impending tension. For Brown students who believe other schools distribute housing in a less stressful manner, here are the facts about the systems at other Ivy League universities.

Columbia University, Cornell University and Harvard University all have some form of a housing lottery. In March, students at Columbia can register for the housing lottery online, either individually or with a group of students with whom they want to live, said Ross Fraser, executive director of University Residence Halls. Fraser said the Columbia lottery occurs in two stages: the lottery assigns housing to groups or suites and then to individuals. All registration is done electronically. "When I first got to Columbia, you'd have to pick a number out of a box. ... Now they've automated the lottery number distribution," said Michael Foss '03, president of Columbia's Undergraduate Housing Council. Cornell students who want to live on campus enter a seniority-based lottery. Rising seniors have first choice for rooms, followed by rising juniors and then sophomores, said Patrick Savolskis, manager of housing and dining offices at Cornell.

Like Brown students, many Cornell students feel the system is unfair, Savolskis said. "There's no perfect lottery system. Someone will always feel they've gotten the short end of the stick. … The ivy is always greener on the other side," he said. Every year after the housing lottery, Cornell's housing office receives scores of complaints from students who are disappointed with their housing, he said. The Harvard lottery system is a bit different. Rising sophomores at Harvard choose a group of students — up to eight in total — with whom they would like to "block," said Diana Hovespian, administrative assistant in the housing office. Harvard then conducts an internal lottery, assigning a random number to each group, Hovespian said. Each group is then randomly assigned to one of Harvard's 13 residential houses, and individual room assignments are made later by the faculty in the house itself, according to Harvard's housing Web site. Most students will stay in this house, only rotating rooms, throughout the remainder of their undergraduate years, Hovespian said.

Housing supply and demand also vary at each school. Housing for Columbia undergraduates is guaranteed for four years, and about 95 percent of undergraduates take advantage of university-provided housing, Fraser said. In light of the expensive and hard-to-find off-campus housing options in New York City, Columbia students are generally content with campus housing, Foss said. "There's no sense of people being unhappy living on campus," he added.

At Cornell, students are not required to live on campus or be on meal plan at any point during their undergraduate education. Housing is only guaranteed to first-years,

sophomores or transfers who wish to live on campus, assuming they register on time for the lottery, Savolskis said. During the Cornell lottery, rising seniors and juniors can only acquire campus housing up to a capped number of beds, Savolskis said. If more upperclassmen want on-campus housing than the number of beds reserved for them, they must move off campus or sign up for the wait list, he added.

Only about 5,800 Cornell students — less than half of all undergraduates — live in dorms, Savolskis said. Even when the number of students living in Greek housing is added to that figure, the number of students living on campus is still less than half, he said. "The off-campus market here is enormous," Savolskis said. Cornell provides free listings for off-campus housing to undergraduates as well as some assistance in dealing with misguided landlords. Harvard guarantees housing all four years and most students stay on campus for the entirety of their undergraduate educations, said Harvard sophomore Diana Saville. Typically, Harvard students are satisfied with their assigned on-campus housing, but a high demand exists for exceptional rooms in each house, Saville said. Saville lives in "the quad," which is notorious for being far from the center of campus and thus undesirable to rising sophomores, but she said the quality of housing made up for the distance. Harvard offers shuttle services to and from the quad, she said.

Heraldsphere: The online service of The Brown Daily Herald
Thursday, February 27, 2003 | vol. CXXXVIII, no. 25
View this story online at http://www.browndailyherald.com/stories.asp?storyID=479
This item appeared in The Herald on Thursday, February 27, 2003

(end of Example 1: Brown)

Example 2: Instructions to students: Rowan

The following information is taken from the instructions issued by Rowan University, New Jersey. The main point to observe is the complexity of these instructions. Rowan use what is essentially a merit system, based on prior academic performance. The lottery is used to resolve ties where students have the same merit score.

OVERVIEW Housing Lottery 2003-2004

The room selection lottery process is for all students who need to select a room assignment for the 2003-2004 academic school year. Students who are currently living on campus get to select prior to all new and incoming housing students. The room selection process is set up to abide by the "Mandatory Housing Policy" in accordance to the Rowan Board of Trustees (see handbook). The process is divided into two (2) separate lottery programs, which every current residential student is assigned a lottery number to their name.

1. Sophomore lottery students who are current freshmen on campus (spring 2003) and will be select housing for their sophomore year in the designated sophomore buildings and areas.
2. Upperclassmen lottery students who are current sophomores, juniors and seniors (spring 2003) and will be selecting housing for the 2003-2004 academic year in the designated upperclassmen buildings and areas.

How does the program assign a lottery number to a student?

Each current residential student falls under one of the two lottery categories in accordance to their earned credit hours at the end of December, 2002 and overall GPA as of December, 2002.

Category 1: Sophomore lottery = 0 - 23.99 earned credits.

Category 2: Upperclassmen lottery = 24.00 – and above earned credits.

After all students are assigned within one of the two categories they are placed in earned credits order (highest to lowest). The program then assigns a lottery number starting from 001. Students who share the same earned credit amount (tied) are then sorted in accordance to the higher GPA. Students' who share the same earned credit amount, and the same GPA, are randomly assigned a number by the program in consecutive order.

2003-2004 ROOM SELECTION PROCESS - Policies

1. The following students are not eligible to participate in the room selection process:

New incoming students (freshmen & transfers) for fall 2003,
On a semester withdraw or leave of absence for spring 2003,
Studying abroad for spring 2003,
Graduating from the University in spring 2003

These students are to go to the Residential Life & University Housing web page (www.rowan.edu/reslife) starting April 12, to print out instructions and forms to apply for housing for the 2003-2004 academic school year.

2. All completed paperwork must be handed in to the Office of Residential Life & University Housing by 4:30pm on Friday, April 11, 2003. All group paperwork will be placed in numerical order according to lottery category. Paperwork, which comes in after this date, will risk its placement in the lottery order.

3. Every student must print out an "Individual Housing Contract" (see "Forms" web link) and turn it in with their group.

4. Every group* must also print out one "Group Contract" (see "Forms" web link) and turn it in with each Individual Housing Contracts.

*Group - students who want to be roommates in the same room or apartment.

5. Every student should also complete a "Meal Plan Contract" and hand it in with their paperwork. Rowan University Policy states that every student assigned to a residence hall must select an appropriate meal plan. Failure to select a meal plan will result in a basic meal plan charge to the students' bill.

6. Only full time commuters (spring 2003) may participate as a perspective roommate in a selecting group. The commuter student must hand in with the groups' paperwork an
"Individual Housing Contract" along with a check or money order made out to
Rowan University for $200.00.
7. Students must completely fill all spaces in their room/apartment selection with a student in their lottery category. Groups who fail to completely fill all spaces in the room or apartment selection will have a random student(s) assigned to their room or apartment.
8. Students can only select in their lottery category. Sophomore lottery students must select in the designated sophomore buildings or areas. Upperclassmen lottery students must select in the designated upperclassmen buildings or areas.
9. Students who want to group together, and are in different lottery categories (sophomore & upperclassmen) may do so as long as they use the sophomores' lottery number and select from the sophomores designated building or area selection. Students who come to Rowan with AP credits, which place them into the higher lottery category (upperclassmen), can select with other upperclassmen in the designated buildings or area. They are also eligible for policy #8 above.
10. Students who have a medical concern request must also supply with their "Group" and "Individual Contracts" an updated letter (on office letterhead) from their primary physician stating their recommendations for that individuals housing assignment. Medical prescription notes will not be accepted. All letter requests will be reviewed and are not guaranteed. Medical requests are for single individuals and not groups.

2003-2004 ROOM SELECTION PROCESS

Directions & Procedures

1. All student are hand delivered their "Lottery Number Informational Letter" by the RA during the week of March 10-14. After March 14 students must go to the Office of Residential Life & University Housing to pick up their "Lottery Number Informational Letter".
2. Students go online to the Housing Lottery link for all forms, policies and directions from March 10 through April 11.
3. Each student must print out an "Individual Housing Contract" and "Meal Plan Contract".
4. Students form Groups, and the lowest lottery number in the group is the becomes the "Group Leader". The "Group Leader" will become the main contact for the group for any questions or concern from the Office of Residential Life & University Housing.
5. The "Group Leader" prints out and completes a "Group Contract" (directions on the back) with his/her group. They complete the "Group Contract" by filling out their building selection at the bottom of the form. (Students should remember that spaces are limited in each building, and that a popular building will fill up quickly by the best lottery numbers.)
6. The "Group Leader" collects all completed "Individual Housing Contracts" and "Meal Plan Contracts" (if applicable) from all members of his/her group.
7. Group Leader attaches all paperwork together, checks to make sure it is completed and drops it off in the Office of Residential Life & University Housing by 4:30pm, Friday, April 11, 2003.

(end of Example 2 from Rowan University)

(from www.rowan.edu/studentaffairs/reslife/lottery accessed 18th March 2004)

Example 3: Instructions to students: Chicago

At Chicago University a clearer message is given to students. A simple first-come, first served system is used here. The lottery is used to prioritise the applications received on the same day.

Room Assignments

What is my room assignment? When will I receive it?
Room assignments are made in July, and written confirmation of your assignment should arrive at your permanent address during the first week of August. International students should allow three to four weeks for delivery. This confirmation includes information regarding which residence hall and room you will be living in, your campus address, the name(s) of your roommates, and which meal plan you have been assigned.

Who is my roommate? Can I contact my roommate before we move in?
If you have one or more roommates, those names and addresses will appear on your room assignment confirmation. Feel free to write your roommate(s) before you arrive. It is our policy to not share phone numbers. If you wish to e-mail your roommate(s), you may contact our office and if the person has provided us with permission to do so, we will give you their e-mail address over the phone.

Can I see my room before I move in?
No - the residence halls are closed to students until the move-in date.

Can I change my assignment before the move-in date?
No. Students may not change their room assignments prior to the academic year, or for the first three weeks of Autumn Quarter. When you arrive in September, your Resident Head will have more information about the room change process.

Why wasn't I assigned to my first or second choice room or residence hall?
The room assignment process was based on a combination of the date your housing application was received and a random lottery for those applications received on the same day. While not everyone received their first choice of residence, every effort was made to accommodate your preferences.

(end of Example 3: Harvard)(from www.**harvard**.edu/campus/**student**.html accessed 18th March 2004)

Example 4: Comment in students' newspaper: Binghampton

From Binghampton , a part of SUNY State University of New York, a news item in 'Pipedream' student review dated 9th March 2004, giving some idea of the reactions of students to the allocation process. Some of this report is evidently tongue-in-cheek.

(from http://www.bupipedream.com/030904/news/n2.htm)(accessed 18th March 2004)

Not Take 5 or Quick Draw, hundreds flood dorm lotto

By Nicholas Roach
Staff Writer

Mohawk Hall's Great Room and lounges were packed with dozens of students, both anxious and eager for a suite in Mountainview's Cascade Hall, during the raffle Monday afternoon. "It's the first chance to get a suite and if we don't get in, there are several other possibilities, and it's nice getting to know early where you're going to live," said Jon Adao, a sophomore computer science major.

Unlike other dormitories, whose residents are decided on the basis of completed credit hours, randomly selected numbers determined who got a room in the 10 female suites and nine male suites open to returning students. "It's been done like this with all the halls that have opened up since Mohawk in order to be consistent and fair to all the students, not just Mountainview residents," said Jeff Horowitz, the assistant director of Residential Life for Mountainview.

Freshman history and English double-major Ashley Morningstar didn't win the lottery, but she thought the system was fair. "They didn't look and say 'Oh, we want you!' They picked numbers. Picking numbers evens out the odds," Morningstar said.

But freshman Jack Glanzberg, whose number was also not called though students bring forced from their current rooms should have gotten first dibbs. "I didn't like the fact that I'm getting displaced," he said. "I was hoping the people who were getting displaced would get priority. I didn't like how they were picking numbers out of a plastic box. It was just a bad experience, overall."

And Glanzberg was not the only Mountainview resident displaced — he was just not one of the lucky ones. "I didn't really think I was going to get it," said freshman Emily Heinegg, whose number was called first at the raffle. "There are just so many people in the room. I thought I had no chance at all. Our room is displaced every year, and we were really hoping we didn't get into Dickinson."

Displaced from Marcy, freshman Lauren Schwartzberg also felt a tremendous weight being lifted off her shoulders when her name was called at the lottery. So did freshman Loren Chang. "It was crazy. The first male number was 53 and mine was 52," Chang said. "They called mine right after it. I felt insanely lucky. I'm going to buy some lotto today."

(end of Example 4: Binghampton)

From these extracts it is clear that organising a lottery-based allocation of student housing requires administrative resources and skills. Specific rules and instructions for users have to be explained and promulgated – although the internet is a great facilitator in this regard. The fact that a lottery is used seems to be taken as unremarkable, and not needing justification. However, there are suggestions from some of the extracts given here that perhaps the students, who are after all the customers of the system, do not understand why a lottery is being used, and may not find a lottery a valid method of allocation.

4.1.2 Analysis: what economists have said about it

Only a few academic economists have addressed the phenomenon of lottery-based student housing allocation (despite it happening, literally, on their own doorstep).

Is it right to give away student housing at below market rents? If a lottery is needed, this indicates that excess demand is being throttled in a non-market way. The alternative – open up student housing to market forces would be the choice of *Milton Friedman:(1946)** If the university authorities decide to rent student housing at sub-market rents, and introduce non-market criteria to decide who should be 'lucky', this is just a special case of rent control. In his very first publication in 1946, Milton Friedman railed against the use of rent control for housing in New York.

**footnote:*This was a joint paper with George Stigler 'Roofs not ceilings' It was reproduced as a pamphlet by the Institute of Economic Affairs, London 1972 17-32 'Verdict on rent control' details in Butler (1985)

Friedman claims that when free markets were allowed to operate in rental housing, it was allocated smoothly, quickly and impartially. The unfettered market, he goes on, has remarkable power to allocate resources efficiently, to signal shortages and surpluses, to curb arbitrary discrimination, to provide variety, to promote experiment, to satisfy diverse tastes. (quoted in Butler).

Although Friedman directs his strictures at City authorities controlling housing rents in general, the criticism is equally valid for student housing: The university authorities decide to hold down the rent charged. There is excess demand, so some administrative scheme is needed to control access. The universities, it seems, are choosing to forego revenue; the students are receiving a bonus, which may be related to their university performance and progress, but is unrelated to their ability to pay.

To create a theoretical framework *Shapley and Scarf (1974) (S&S)* deal with the way in which indivisible commodities are traded, taking house bartering as their main example. The method of analysis is Game Theory. I introduce it here, because it describes the framework which others have used for analysis of allocation problems which are encountered in university student housing. S&S start with a definition of the 'core': " a set of outcomes that are coalitional optimal – that they cannot be upset by the collusive action of any subset of the participants, acting by themselves".

Moulin (1995) (p15) explains this nomenclature a bit more. The 'core' represents the efficiency postulate, or is another expression of Pareto-optimality. Moulin earlier (p6) endorses the centrality of Pareto-optimality as "the one and only uncontroversial normative argument in economic theory. One of the main tasks (some might say its only legitimate task) is to look for ways and means to promote a Pareto-optimal outcome of the economy." S&S would no doubt concur, and hence their 'core' concept, Pareto-optimality in another guise, translates easily into the most desirable outcome attainable.

The 'core' can either be empty – no Pareto-optimal solution possible, have two or more solutions, or ideally be unique. Using Game Theory, S&S produce what Moulin (p105) calls a remarkable result: that the house bartering model *always* yields a unique 'core' allocation. This result depends on the individuals involved having a set of preferences over the available set of houses, with no ties. Nor does not preclude individuals damaging their own house for strategic reasons. S&S then go on to introduce the concept of a *top trading cycle* – (usually attributed to Gale) when each individual in the trading process gets their first choice.

Aanund Hylland and Richard Zeckhauser (H&Z)(1979)(referred to in the previous section) identified some of the problems with the student housing lottery at their own university of Harvard. In a lengthy footnote they explain the problems that arose there in 1970's, when some students, given strong incentives by the system, adopted strategic behaviour in the run-up to the lottery. In their paper, they try to produce an improved mechanism, which will still allow students to express preferences over housing, but without encouraging strategic behaviour*.

*(It is interesting to see that some twenty-eight years later, Harvard is still using the lottery: According to the current Harvard university website at http://www.fas.harvard.edu/~uho/ (accessed 19th Mar 2004) the 2004 lottery for freshman housing is now closed. A generation later the lottery system seems to be still serving the needs of Harvard, its administrators and its students.)

H&Z describe the process of allocating students to housing as a 'social choice mechanism'. They make the usual assumption that the process should be Pareto-efficient, but identify the central difficulty of eliciting honest preferences from individuals. They are particularly sensitive to individuals falsely representing their

preferences for strategic reasons, which is of course what had happened at Harvard in 1970s. They allude to the 'prescribed distributional objectives' of the process: This may be to treat everybody equally, or to give some individuals systematically favoured. These objectives are not explained or justified, nor do they attempt to relate them to Harvard university policies or principles.

Kenneth Arrow's Impossibility theorem had suggested that there can be no distributional procedure which is both efficient and satisfies equity criteria. H&Z suggest that they can produce a mechanism which can yield a positive result. They go further, and explain that they will develop and explain such a mechanism, and illustrate its use in practice. In essence what H&Z propose is a pseudo-market: Individuals need to list not just their ordered preferences but how strongly they feel about each one. The mechanism then acts like a blind auctioneer, and 'purchases' a weighted lottery on behalf of each applicant. By sifting through these lottery-weighting proposals, it is possible to create an optimum weighted lottery which will maximise expected utility over all applicants. There is an impressive amount of illustration and game theoretic analysis to support this claim, but H&Z did not, it seems take the final step – to try it out on an actual group of freshmen students.

Such a strong result could not be achieved without making some strong assumptions: H&Z assume that

- each student's preference is unaffected by others choices
- this is not a 'marriage problem' – houses have no preferences for particular students
- it is possible to ignore the institutional context, where for example the organisation might wish to achieve a representative spread by region as a result of its allocations

H&Z refer to their proposal as one which assigns probability shares to individuals based on their stated preferences. To enable the computations, they draw on the algorithms developed by Shapley and Scarf (see above). One result is that, so long as the market has a sufficiently large number of participants, no-one can unduly influence it. Strategic behaviour is thus pointless. Considerations of equity are also addressed: Since the mechanism proposed gives everyone an equal opportunity set,

there will be no *envy* – no-one would swop their pre-allocation probability share with another, nor would they wish to swop afterwards. Pareto-optimality is achieved.

Abdulkadìroglu and Sönmez (1998) (A&S) make use of the mechanism of lottery allocation of university housing to develop two technical tools. The first relates to Gale's top trading cycle. The second is to identify when a matching mechanism can be Pareto-efficient. Drawing on the work of Shapley and Sharf as well as H&Z (described above), A&S develop the idea of a *random serial dictatorship:* this is just another way of describing the usual university housing lottery. The dictator is the university administrator, who selects which applicant is to have first choice. As an alternative, A&S introduces a process which they label *core from assigned endowments.* This looks very similar to the mechanism proposed by H&Z in the previous section. In their paper A&S show that the 'core from random endowments' has the following appealing properties: it is ex-post Pareto-efficient, anonymous, and strategy-proof, but not ex-ante Pareto-efficient.

4.1.3 Identifying the economic design features

There are two parties to the allocation: the university authorities and the students. The university will be the client for any proposed design of an economic allocation mechanism, and their wishes must have prior consideration. But they will certainly want to achieve a satisfied student body.

What is the client's Brief?: All design work should start from the client's brief. Since it is the university which owns and charges for the housing it rents to students, it must be the university which is the client in this case. In the analysis given in the previous section, none of the writers gives any direct evidence of what the university is trying to achieve by using lotteries to allocate student housing. Instead, the objective of Pareto-optimality is assumed, based, presumably on its universal acceptance (*pace* Moulin) by economists. H&Z hint that there may public choice issues involved: Either the university wishes to treat all students in an equal fashion, or they may wish to give special treatment to particular categories. Failure to understand the client's wishes and produce unwanted technical solutions is well-known to design engineers, as illustrated by the widely circulated cartoon shown in Figure 1.

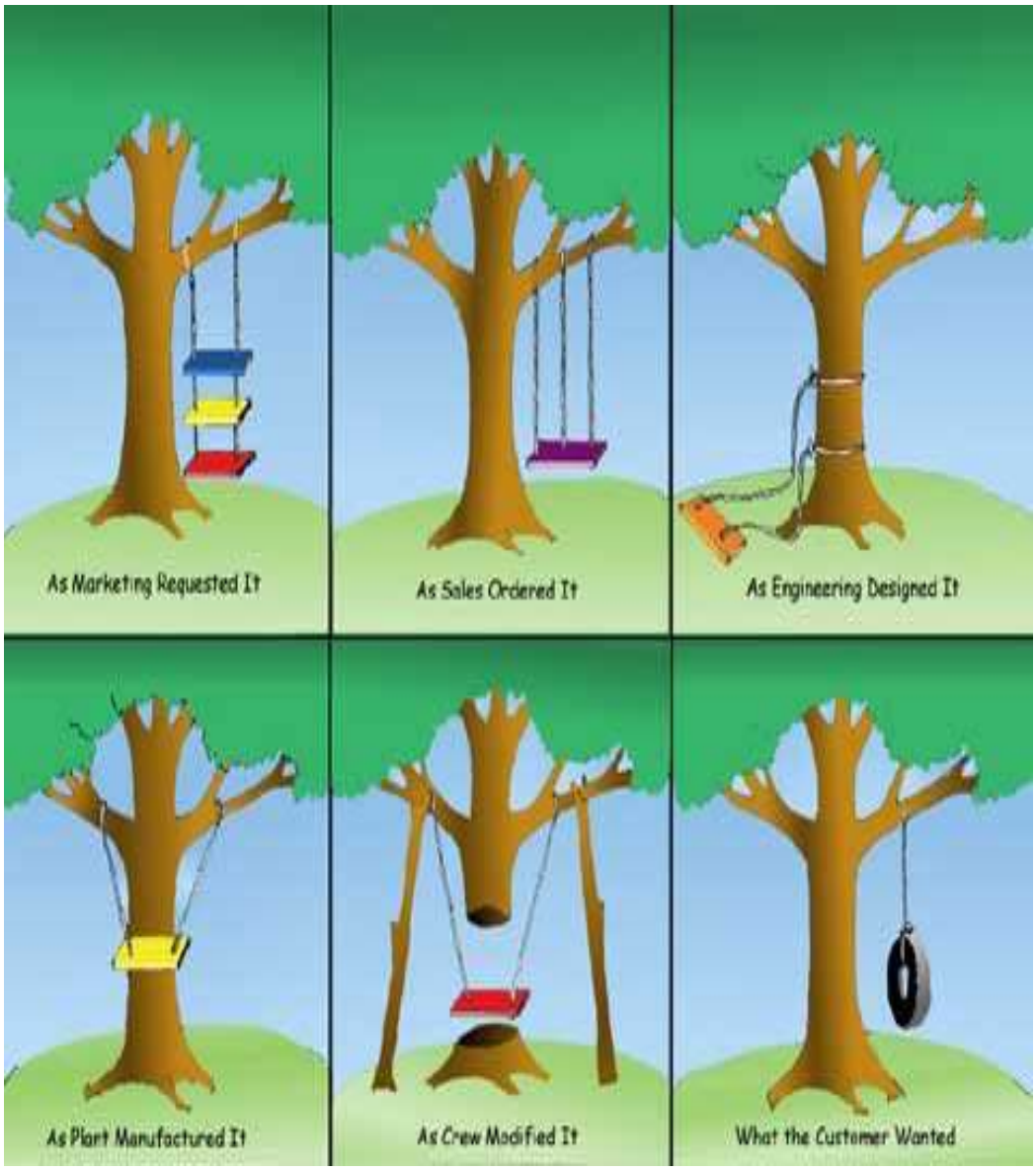

Figure 1: A favourite cartoon among design engineers

This shows how technical people can blunder into unwanted solutions. Is Pareto-optimality the economists' unwanted (or incomplete) solution?

It may be that the universities persist in their use of lottery-allocation through inertia, ignoring the revenue-enhancing potential of a more market-based approach. However, it seems most improbable that so many universities would persist in charging below market rentals, without good cause. There is doubtless pressure to increase revenue from all activities at US universities as elsewhere: Higher rentals could be used to equate supply and demand for student housing, generate more profit, as well as avoiding complex (and resented?) allocation procedures.

Since the university authorities have been renting housing at below market rents for many years, then it is surely worth asking: Why? In the absence of direct evidence from the field, it could be speculated that universities adopt a sub-market rent strategy because:

- universities compete for students. Housing becomes a 'loss-leader'
- excess demand means that entry can be better controlled, and undesirables expelled
- a belief that part of the costs of a merit good like university education should be subsidised
- students are part of the community of the university, which includes the faculty staff as well as the alumni. Being subsidised as an undergraduate creates a moral obligation to contribute later in life, that there is an implicit inter-generational contract.

Once a sub-market rent strategy has been adopted, then some means of coping with the inevitable excess demand has to be found. Why use a lottery as part of the process? The best answer to this would be to conduct field research. In the meantime it could be speculated that:

- administrative convenience. A lottery is quicker and cheaper to run than some rule-based merit system.
- it avoids any taint of discrimination, which could be extremely damaging to the reputation of the university
- University may aim to mix up students from different faculties, to achieve better socialisation, and awareness by students of other parts of the institution

- it is an enjoyable bonding experience shared by many students

But what of the students? Are they just optimising customers of the university housing allocation system? All the writers in the previous section make the assumption, so strongly endorsed by Moulin, that Pareto-optimality is the one desirable characteristic of lottery or indeed any other system of university housing allocation. None makes any attempt to show that students wish to be treated solely as customers of a hotel-like operation, although this is probably a reasonable first assumption.

It is instructive to compare student room allocation with the process which is followed by hotels when allocating customers to rooms. There are similarities: Rooms have vary in desirability. The hotel administrator is a 'dictator' in the sense that A&S use it. But university and hotel room allocation are different in significant ways:

- Hotel room allocation is clearly a market-driven customer-oriented activity. You will pay more for 'sea view' or 'balcony'.
- Customers flow in and out of a hotel at different times, and generally stay for a short time
- Hotel customers can talk to each other about prices paid and room locations, but have little chance to do so, and are inhibited by language, culture etc, because of diversity of clientele

Students, too, will act like hotel customers, wishing to be allocated the best room, with the nicest view. So the Pareto-optimising assumption of the previous section still holds. But there are other factors, peculiar to university room allocation:

- Inter-personal comparisons are inevitable and widespread. Students are sociable beings and will have plenty of opportunity to compare. Since room rentals are the usually the same for all properties, this sharpens the incentive to compare. Students, being more idealistic than the population at large (?) are more aware of situations that they perceive as unfair
- Who is my neighbour? can be as important as the quality of the room allocated. It could be speculated that gloomy rooms would be most desirable if the 'leader of the pack' is already installed in one. Post-

allocation swopping is generally allowed, and may have much more to do with being near friends, than achieving a better room.

- In a desire to become a member of the club of the university community, a communal ceremony like a room allocation lottery could be most attractive (mirroring the university's desire to engage students as members of the university).

4.1.4 Overall conclusion:

- university room allocation has market-like characteristics, similar to hotel room allocation, but
- to foster a sense of community among its students, the university seems to be prepared to forego some revenue. The lottery is a tangible expression of this.
- students may be pleased to endorse their 'membership' of the university by engaging in the collective ritual of a lottery (despite perhaps achieving a sub-optimal room allocation)

This could be developed using a functional form as follows

The university has a production function for housing made up from

- a revenue maximising element: balancing income against costs
- socialisation element, wishing to engage students as members of the student body
- stakeholder responsibility element: to act fairly, equating expenses between different generations of students, including alumni, the professions, the government, the productive economy

The students utility function could have the following elements

- maximise consumer satisfaction from the attributes of the room rented out, including avoiding envy of colleagues allocation
- maximise the quality of neighbours
- feel part of the university

A field study to determine whether any of the above are valid characterisations of the process would be essential before developing any algebraic formulations. Without some form of on-the-spot validation it is difficult to understand why such a seemingly inappropriate distribution mechanism is so widely accepted and used.

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