Chapter 2

PRICING LEMONS, VIEWS, AND UNIVERSITY HOUSING

Prices capture a whale of a lot of information on the scarcity of the resources that go into the production of products and on how much people value various goods. Prices enable buyers to economize on their time. By not having to know much, if anything, about production conditions in various parts of the world or about consumer tastes other than their own, buyers can focus their time and energy on comparing prices and attributes of goods they want to buy that, with as much income as many buyers have these days, is not always an easy problem.

Buyers can be forgiven if they are lulled into not understanding why many prices are a mystery in that that they don't seem to reflect production costs and consumer values, as reflected in the precipitous drop in the resale price of new cars as they exit the dealer lots. They might also be forgiven if they accept, without reflection, many comments on prices that, because they are heard so frequently, seem indisputable, such as in the comment real estate agents often parrot, "Houses with views sell quicker than houses without views."

In this chapter, I attempt to explain the wisdom of another quip economists often make, "If everyone believes it and says it, doubt it!" You will find that the "law of unintended consequences" will remain with us as we consider several pricing puzzles and frequently heard glib comments about prices, which are puzzling only because so many people believe the comments in spite of the fact that the comments are often patently misguided.

CHAPTER 2

THE PRICING OF LEMONS

I'm a great believer in how important economic lessons can be learned from unraveling puzzles. For a long time economists were puzzled by the fact that new cars drop precipitously in value once they are driven off dealer lots.

One well-worn explanation is that many car buyers yearn for the "new-car smell" and are willing to pay a premium for new cars over what they are willing to pay for used cars, even cars that may have only recently left dealers' showrooms. Another explanation for the new/used-car price differential is that car dealers are in the business of making markets for their cars with glitzy showrooms and glossy advertisements. Car owners are not in a position to maintain the demand for their cars that the dealers created. As a consequence, car values drop on leaving dealer lots because the demand for the cars drops.

Such explanations cannot be summarily dismissed, but we must wonder if they are the whole story, especially since the resale price of a car just driven off a dealer's lot can be 20% (or upwards of $10,000 for some luxury cars) below its purchase price. Economist George Akerlof has offered perhaps a far more telling explanation for the price gap between comparably-equipped new and used cars.[1] To keep the analysis simple (as does Akerlof), suppose there are two types of used cars, good ones (which have low maintenance costs) and bad ones (which have high maintenance costs),—with the bad ones commonly known as "lemons." Buyers will discover which cars they have from using their cars. Hence, they will have information, drawn from their experience, about their cars' quality that potential buyers of used cars will not have. Information on car quality will be decidedly one-sided—or "asymmetric"—meaning buyers and sellers do not go into potential deals with the same level of information.

Buyers in the used-car market can be expected to reason that new-car buyers who learn they have good cars will keep their cars. On the other hand, buyers who learn they have lemons will want to lower their car maintenance costs by putting their cars up for resale. Hence, the available used cars can be disproportionately dominated by lemons. That is to say, used-car buyers will have to worry that they will likely buy problem cars, or cars with nontrivial repair costs. The price of used cars must drop if buyers are to be enticed into buying used cars. Of course, as the price of used cars drops, car owners with problem cars, which are not total lemons, can be expected to pull their cars off the resale market, because they can be better off incurring their modest repair costs than suffering the lost resale value. This means that the available stock of used cars for sale will become even more heavily dominated with (serious) lemons, again, given that the bet-

ter-used (problem) cars will be retained by the owners. A drop in the price of used cars can, in other words, lead to a further drop.

This line of argument draws into question a frequently heard claim that "used cars are better deals than new cars" because of the dramatic price difference between them. If that were the case, and everyone knew that were the case, then the demand for used cars would rise while the demand for new cars would fall, causing the prices of used and new cars to converge, until used cars were not the "better deal" they are claimed to be.

Sure, used-car buyers can pay a much lower price than they would have to pay for new cars, but they must also suffer the normal wear and tear attributable to the miles put on the used cars. More importantly, used-car buyers have to suffer the risk cost associated with buying in a market potentially dominated by lemons that can translate into high repair costs (especially when the warranties on the used cars have expired).

Granted, the new/used-car price differential might be expected to exceed the expected repair cost, but that still doesn't make used cars "better deals." The problem of asymmetric information can't be denied; it is a real problem that used-car buyers have to consider as best they can. The prospects that used-car buyers just might buy cars with repair costs far higher than "average" can weigh down the price they are willing to pay for used cars.

In the so-called "lemon problem" (as with all "problems"), there is money to be made by entrepreneurs who can solve the problem. Individual used-car sellers might have a credibility problem with potential buyers the sellers do not know, but sellers can elevate the price they can charge by, for example, allowing potential buyers to have the cars they are considering inspected by mechanics. Used-car sellers might only try to sell their cars to relatives and friends where their word on the quality of their cars would carry more weight, because of the potential ostracism sellers might suffer if they are not true to their word. And sellers can also pay for extended warranties, which is a means sellers can use to ease the risk facing the buyers. Presumably, the added price used-car sellers charge for their cars because of the warranties will at least cover the price of the warranty.

Alternately, used-car sellers can sell their cars to reputable dealers who can pay premium prices for used cars because they can get even greater premium prices from the resale of their used cars. Dealers can charge premium prices to the extent that they have established reputations for honest dealing, a line of reasoning that explains why so many new-car buyers trade-in their used cars when they buy new ones. New-car buyers can get better deals on their trade-ins from

the dealers than they can get from individuals, and the dealers can make money on the trade-ins because they solve, to a degree, the lemon problem, or rather the underlying asymmetric information problem in the used-car market.

Akerlof points out that the problem of selling health insurance to the elderly has features of the lemon problem. As people age, those who see themselves as being most in need of expensive and frequent healthcare are the ones who are most likely to buy health insurance. Healthy people will be less inclined to buy health insurance. This is especially true because health insurance providers will have to charge premiums that reflect the relatively high costs of healthcare provided to policyholders that, as a group, will tend to need lots of healthcare, which makes them, for all intents and purposes, "human lemons." As the price of health insurance is raised to accommodate the so-called problem of "adverse selection" (or the tendency of people to buy insurance when they expect to be beneficiaries), healthier people will drop out of the insurance market, leaving policyholders even more dominated by people who expect to need lots of healthcare. The price of insurance will have to rise again to reflect the growing adverse selection problem.

Akerlof notes in passing that the "lemon problem" in healthcare is an argument for some form of national health insurance for the elderly. That could be the case, but what Akerlof doesn't mention is that public provision of healthcare can give rise to other problems. If people know that they will not have to pay for their health insurance when they become elderly (and will not likely have to pay a premium in line with their state of health when they are elderly), they can have less incentive to take care of themselves before they have access to public provided health insurance. In addition, if healthcare for the elderly is heavily subsidized, then we should expect the elderly to demand more healthcare than they otherwise would, and that increase in demand can push up healthcare prices for everyone, including the young. The result can be an increase in the health insurance prices the young face, with many of them deciding not to buy health insurance because their expected healthcare costs are lower than their insurance premiums.

Insurance companies have found ways of solving the adverse selection problem in health insurance, at least somewhat. First, they provide health insurance policies to workers through their employers. Such a distribution channel has one largely unrecognized advantage: It reduces the pool of policyholders who can't meet a minimal health standard, being able to work and hold a job. In other words, group health insurance policies narrow the adverse selection problem.

Second, health insurance typically gives policyholders a menu of policy options, with a key differentiating feature being the size of the deductible, after

which all care costs are covered by insurance. The policyholders who seek a small deductible are self-identifying themselves as people who see themselves as likely needing a great deal of care (including lots of office visits that require only small "co-pays"). The policyholders who select a high deductible are self-identifying themselves as likely needing little care. The insurance company can simply charge the low-deductible group far more than they charge the high-deductible group. This line of argument helps explain why in moving from a deductible of $250 a year to $1,000 a year, the premium drops by substantially more than $750 a year. This is because the policyholders move from a high healthcare-cost group to a low healthcare-cost group.

HOW PRICES ADJUST TO ADVANTAGES AND DISADVANTAGES OF PROPERTY

One of the unheralded advantages of prices is that through market forces, they capture the advantages and disadvantages of property, in the process giving a market value to the advantages or disadvantages. Prices adjust until buyers are more or less indifferent between properties. In this section we consider three real-world cases of how property prices can neutralize the advantages and disadvantages of different properties: 1) property inside and outside floodplains, 2) property with and without views, and 3) property that is owned and rented.

PROPERTY INSIDE AND OUTSIDE FLOODPLAINS

Should we feel sorry for our fellow Americans in the Midwest (or elsewhere) who are, from time to time, flooded out of their homes by nearly forty days and nights of continuous rain and snow? Of course we should. Vivid reports of mounting property losses from floods on television and in newspapers do weigh heavily on just about everyone's emotions. No one wants to see others suffer, and the outpouring of aid for flood victims is understandable—as a raw emotional response. We all are, or should be, our brothers' and sisters' keepers—*to some reasonable extent*, with "reasonable" meaning the consequences of helping victims guiding and constraining our judgments.

We can't dismiss the question—should help be provided?—summarily, as if the only answer is that we should help, because that question leads, inexorably, to the tougher questions of how much help should be rendered and in what form. Those decisions must be grounded in a hard-nosed assessment of the real

damage incurred by flood victims—and potentially caused by the relief itself. Such an assessment may cause us to reach a paradoxical conclusion: on balance, many flood victims may not be *victims* to the extent media reports indicate, at least as measured by their *net* losses—in spite of the fact that many have experienced sizable property losses. The paradox can be unraveled with a little reflection on the economics of floods (and other similar natural disasters), and how the consequences of floods and relief for victims can be captured in prices.

By virtue of an area's designation as a "floodplain," people who live in them, or who might contemplate living in them, know that floodplains are prone to floods with varying frequency and duration (but most often with *expected* frequency and duration). The residents (and prospective residents) might not know exactly when the floods will come or how severe they will be when they come, but that should not stop them from considering the prospect of floods and the damage that must be endured when the floods do occur. The prospects of floods, without much question, temper the market's demand for pieces of property in floodplains, causing their market values to be lower than property with similar attributes but without the prospects of floods and the damage that goes with them.

This being the case, when viewing alternative pieces of property, some in and some outside of floodplains, prospective buyers should not be willing to pay as much for floodplain property as for other property that is deemed safer. Indeed, prospective buyers should lower the price they are willing to pay for floodplain property by an amount at least equal to the *expected* losses during floods (with the actual losses, measured in dollars, discounted for risk and time). The greater the frequency and duration of floods, the greater the expected damage, and thus the lower the expected floodplain property prices.

To illustrate, if a house on a "safe" piece of land outside of a floodplain costs $100,000 and if the expected losses from floods on a comparable house and piece of land inside the floodplain is $20,000 over the foreseeable future, the floodplain property should sell for $80,000 (more or less). If the floodplain property had a price of $90,000, the total cost, including the loss from expected floods, would be $110,000, which means the prospective buyer would turn to the property outside the floodplain. Hence, the price differential between the property inside and outside the floodplain can be expected to diverge until it is (roughly) $20,000. With the price gap of $20,000, the floodplain property owners can endure $20,000 of losses without actually being any worse off than they would have been had they chosen to buy outside the floodplain.

Clearly, some floodplain property owners will suffer heavier losses than were expected, mainly because floods cannot be predicted precisely, or may occur

more frequently and/or be more severe than expected. By the same token, some property owners, in spite of their losses during floods, can be net gainers, mainly when their losses turn out to be less than expected, that is, lower than the discount they received on the price of their property for buying in a floodplain.

For example, suppose the owners in the above example who bought the floodplain property for $80,000 suffer only $12,000 in flood-related losses. In effect, they realize an economic gain, on balance, in the instance of that flood because their flood-related losses are $8,000 less than the $20,000 premium they would have had to pay for property outside the floodplain. Ironically, those who bought outside the flood-prone area and are not flooded lose, in this example, more than the victims of the flood; the non-victims lose the premium paid on their property, $20,000. (I know some readers may be thinking that flood victims must work to clean up their property. True enough. Such clean-up costs will simply increase the price gap between the property inside and outside the floodplain. The basic point is left undisturbed.)

Flood insurance might seem to be an obvious way for the floodplain property owners to protect themselves against losses. The problem private insurance companies face in making available flood insurance is that the likely flood victims know who they are, and they will be the only ones wanting to buy flood insurance. People outside the floodplain know they are safe. Why should they pay flood insurance premiums? Again, the problem of adverse selection (a form of the lemon problem) rears its head. The floodplain property owners are unwilling to pay more for flood insurance than their expected losses from floods. Hence, the insurance companies can't charge more than their expected payouts that will equal the victims' expected losses, which means the companies can't make a profit, if all they had to cope with was the problem of adverse selection. Insurance companies face the added problem of "moral hazard," or the tendency of policyholders to change their behavior, which in this case would mean putting more property at risk because their prospective flood losses are lowered due to their flood insurance coverage.

Because of the problems of adverse selection and moral hazard, if flood insurance is going to be provided, it generally must be heavily subsidized, which it is in the USA. Premiums of flood insurance policies written under the National Flood Insurance Program of 1968 are 35–40% of what the true risk premiums would be to cover expected damage. Accordingly, it should be no shock that in 2003, payments for flood losses amounted to a half a billion dollars more than the premiums collected.[2] The problem with so many government aid programs is that they force the Americans who paid premiums for their property outside floodplains to cover the losses of people who bought discounted flood-prone

property. One must wonder, then, who are actually the victims, those who live inside floodplains or those who live outside them?

The point of following this line of argument is not to say that no aid should be provided. Rather, it is to stress that aid should be provided very judiciously and with great caution and restraint. If the losses of flood-prone property owners are fully covered by aid from, say, federal and state treasuries, the real benefits of the relief effort are likely be short-lived—not because the aid will dry up (pardon the pun) but because property values will adjust to account for the expected aid in the future. Prospective buyers of property inside and outside floodplains can be expected to take into account the expected aid for flood victims in their purchases. The demand for floodplain property will rise, as will its market value, in line with the expected aid. Future prospective owners of floodplain property will no longer get discounts for their expected losses on the floodplain property they buy. The expected (discounted) value of the future aid will be captured, in effect, in the current prices of floodplain property. The gainers from the aid will not necessarily be the owners who incur the losses when the floods actually occur (they've had to pay upfront, before the advent of the flood, a premium for their property because of the aid they receive), but rather the former property owners who receive a price for their property that was inflated by the prospective aid going to current or future owners.

In fact, when aid is routinely offered to victims of floods, it can actually raise the number of victims and the amount of their losses during floods. This is because of the problems of adverse selection and moral hazard. Knowing that all or a significant portion of their losses will be covered, more people will be willing to move to floodplains, to build bigger and more expensive houses there, and to stock them with more expensive furniture. They may even be less inclined to try to save their property in times of floods. They can also be less inclined to self-protect themselves with flood insurance, which means that flood insurance must be even more heavily subsidized to get floodplain property owners to buy the insurance. Why? They can expect some, if not all, of their prospective losses will be covered by disaster relief programs. Only by public policymakers and agency administrators (and charity groups) being extremely cautious and conservative in the allocation of aid can we reduce the perverse incentives inadvertently fostered by aid programs.

Victims of major natural disasters—whether in the form of floods, earthquakes, or hurricanes—receive a great deal of attention in the media and from government agencies because they are easy to identify and their numbers are large. They are natural candidates for government largess. However, many other people in the country are victims of a series of minor natural and man-made di-

sasters, with their total losses often exceeding the losses of victims of major floods. Nevertheless, the victims of a string of minor losses are often ignored by government and the media, though their numbers are large, precisely because they are not so easily identified and their relatively small losses in each isolated minor disaster are not headline makers. We must be cautious in giving aid to the victims of floods because the aid may not be allocated evenhandedly across all victims of all major and minor disasters. Those who suffer unacknowledged minor disasters may actually be double victims, for not only do they lose when they endure their own losses in minor disasters, but they are also called on to aid the victims of major disasters.

Floods have a way of destroying property. Hard-headed thinking has a way of throwing cold water on emotional responses to losses that are suffered and widely reported. There is no clear argument against aid, but there are very good reasons for exercising considerable restraint, especially when many flood victims are fully capable of buying property outside of potential disaster zones, but choose not to do so. Unless carefully crafted, aid programs can create policy disasters that are no less threatening and damaging than the natural disasters themselves. Disaster aid that is routinely given and becomes expected by property buyers can entrap policymakers because, as noted, the future value of the aid can become captured—or to use the jargon of finance, capitalized— in the value of the property. When aid is capitalized in the value of the property, then any withdrawal of aid can undermine the value of the property, which means that the withdrawal of aid can destroy the market value of property as surely as can natural disasters.[3]

Our consideration of aid for flood victims elevates a lesson that has wide applicability: Prices today can capture expected gains and losses going forward. Change the streams of prospective current *and* future gains and losses on properties, and today's prices of those properties can capture the change.

HOUSES WITH AND WITHOUT VIEWS

This lesson lays open the folly in many widely heard and believed claims. Consider the often-repeated claim of real estate agents who glibly announce that "houses with views sell more quickly than houses without views." Perhaps that is sometimes the case (just as the opposite is sometimes the case), for reasons unassociated with the presumed value of the view, but should we expect the claim to be systematically reflective of the housing markets because of the difference in views houses have?

I have no qualms with the equally often-made claim that houses with views sell for higher prices than comparable houses without views. Of course, houses with views will sell for more—precisely because of the (presumed) value of the views of, say, the ocean or a mountain valley. (Similarly, no one would doubt that houses with views of garbage dumps will sell for less than houses without such views.) Indeed, we would expect comparable houses to have price differences that approximate the market value of the view, which will be affected by the relative scarcity of such views. The greater the abundance of (good) views, the lower the market value of views, and the lower the view premium that will be captured in the value of the property with views.

My question is, however, why houses with views should be expected to sell systematically *faster* than houses without views? If houses with views did sell faster, might we not expect their owners to hike their prices even more to slow the pace of their sales to the pace of sales for houses without views? Might not owners of properties without views lower their prices to speed up the sale of their properties?

Granted, there is one possible reason houses with views might sell more quickly, *but not so much because of the views in and of themselves* (without their implication for the value of the property). Because of their relatively higher prices, owners of houses with views might have more equity in their houses than do owners of houses without views. They might want to unload their houses with greater urgency because of the greater cost of delaying their sales, with the greater cost equal to the time-value of their relatively greater equity. But then, buyers of houses with views might be expected to be as reluctant to tie up substantial equity in a house, through a quick purchase, than the sellers are to get their equity out of their houses. Maybe buyers and sellers of houses with views have different discount rates—that is, they place different time values on tied-up home equity. Otherwise, we should expect, as a rule, the prices of houses with and without views to adjust so that their speed of sale is very close.

HOUSES OWNED AND RENTED

Consider another claim. "Buying a home is a better deal than renting an apartment. The interest on a home mortgage is tax deductible, and the value of homes can appreciate." I am sure every reader has heard the argument. If the argument carried the weight of truth that the proponents suggest, we must wonder about the sanity of the hordes of apartment renters around the country. Many renters can afford to buy their own homes but choose not to do so, for good economic

reasons apart from the fact that they don't want to put up with the problems of maintaining owned homes. If there were a decidedly large tax advantage to buying homes, then we would expect two consequences that would narrow, if not eliminate, the relative value of owning a home vis-à-vis renting an apartment: First, the demand for owned homes would rise, along with their prices. Home sellers would capture much, if not all, of the tax advantage. Second, the demand for rental apartments should fall, along with their rents. Besides, people who press the argument about the tax deduction of mortgage interest often fail to acknowledge that owners of apartment complexes have mortgages, and they can deduct their interest payments from their rental charges. Apartment owners' tax advantage should show up, through competition for renters, in lower rents.

Granted, homeowners can see their property values appreciate, but they can also see them depreciate. Such downside risk should temper people's enthusiasm for buying the argument, stripped of qualifications, that owning a home is a better deal than renting. Moreover, if homeowners can be confident that their home values will appreciate, then surely the sellers can work from the same expectation, which means sellers can be expected to capture some, if not much, of the expected appreciation in the selling prices. Also, it makes sense to rent for a longer period than otherwise when renters expect housing prices to fall or even when they expect the appreciation of housing at some point in the future to spike upward. Renters, in other words, can be affected by what they *expect* to happen to housing prices in the future.

All of this is not to say that homeownership is never a better deal than renting. It is to say, however, that market-induced adjustments to prices help us understand a would-be puzzle, why so many people continue to rent in full knowledge of the ownership "advantages" they forego.

WHY RETIREMENT DOES NOT CURB THE RETIREES' FOOD CONSUMPTION

Many social scientists have observed what for them has been a puzzle: after retirement, people drastically cut their expenditures on all goods, but especially food. Indeed, two economists, Mark Aguiar and Erik Hurst, found that people's food expenditures rise from the time they are in their early twenties until their early fifties, but their food expenditures fall by 17% at retirement. While high-income people spend more on food and tend to eat healthier both before and after retirement, the food expenditures of all income classes decline markedly at retirement.[4]

Some researchers, finding even larger drop-offs in food expenditures, have concluded that the pre/postretirement drop-offs in food and other expenditures prove that people do not plan for their retirement very well. They've also concluded that people are obviously not as rational in their behavior as economists conventionally assume. If the subjective value of food declines with the amount consumed, the value of the last dollar spent on food postretirement has to be greater than the value of the last dollar spent on food before retirement. People could improve their welfare by consuming less food in their preretirement years and save more to boost their consumption of higher-valued food in retirement. Researchers inclined toward social activism have used the decline in retiree's expenditures on food and other goods to support their political case for forcing (or inducing) people to save more for retirement than they are inclined to save voluntarily.

Economists who have based their theoretical careers on the assumption that people are rational (or more rational than retirees seem to be) see the findings of people's lifetime consumption patterns as a major puzzle. Rational people should tend to even out their consumption of goods over the course of their lives, following what has been dubbed the "permanent-income hypothesis," which is based on the work of the late Milton Friedman, a Noble Prize-winning economist.[5]

The problem with this analysis is that it fails to recognize important points about prices and retirement:

- First, the *effective* prices of so many goods people consume are not captured by what's on price tags alone, mainly because things people buy are really inputs (or resources) into what people produce at home for themselves (a point stressed most prominently by economist Gary Becker, another Noble Laureate[6]). The prices of home-produced goods can rise and fall with the prices of inputs *and* the opportunity costs of people's time.

- Second, on retirement, people who retire knowingly give up some income to gain more time to do what they want. Retirees may have less income to spend on food, but they have more time to search out food bargains and to produce their own meals. This means that retirees' *consumption* of food can differ markedly from their *expenditures* on food.

Once these points are recognized and accommodated in analysis, perhaps people's lifetime consumption patterns are not the mystery (or as out of sync with rational precepts) we have been led to believe. Indeed, Aguiar and Hurst

have found that after retirement people devote, on average, 53% more time to shopping for food and to preparing their own meals than they did before retirement.[7]

One explanation for why people increase their food expenditures through their early fifties is that they are substituting prepared foods and meals out for time-intensive and (because of the opportunity value of their time) higher-cost meals at home. Along the way, with less time spent searching for good deals on food purchases, they probably pay higher prices than they would have to pay if they had more time for searching out deals. When people retire, they will understandably become more price sensitive, since they will have more time to check out prices and features of alternative goods they want to buy and will thus have more knowledge of which goods have lower prices (given their qualities and features). One explanation for "senior citizen discounts" is that stores understand that seniors are more price sensitive, with the senior citizen discounts feeding declines in their *expenditures*, not their *consumption*.

Aguiar and Hurst have found, contrary to conventional wisdom, people's *consumption* of food remains more or less flat from their early twenties through their late forties but then trends upward, albeit slightly, through their early seventies (the last age the researchers have the necessary data to make the required consumption calculations). While it is true that retirees spend less on meals out than they did before retirement, the reduction is largely in expenditures at fast-food restaurants, not sit-down restaurants. Moreover, retirees do not tend, as a group, to lower the healthiness of the food they consume.[8]

Clearly, while people face difficult problems in planning for retirement, they seem to be doing much better than many people have surmised by considering misleading *expenditure* figures.

UNIVERSITY MISPRICING

Like so many other state-funded universities, my university—the University of California at Irvine—wants to believe that it can pursue higher academic standards through price controls on student and faculty housing. This on-campus housing will, supposedly, have the effect of indirectly subsidizing student education and faculty salaries. The presumption is that the subsidies can increase the "quality" (however the university wants to define "quality") of its students and faculty who can do great work on campus for the benefit of the rest of the world. Unfortunately, the university's controlled prices for student and faculty have had much the opposite effects of those intended. To be more direct, the implicit

housing subsidies embedded in the price probably have in unexpected ways undermined the overall quality of the university's students and faculty.

STUDENT HOUSING SUBSIDIES

The University of California-Irvine provides a limited number of graduate students with on-campus apartments at monthly rental prices that are several hundreds of dollars below the rental prices in Irvine and other surrounding Orange County communities. For example, at the time of this writing in early 2007, a two-bedroom graduate student apartment on campus rented for $600 a month. A similar size nonuniversity apartment across the street from the university rented for $1,990. Two-bedroom apartments a mile down the road from the university rent for more than $2,500 a month, partially because the apartments are nicer, but also because the apartment complexes seek to price (potentially unruly) students out of their apartment complexes, increasing the net value of the apartments to the nonstudent residents who pay the premium rents.

The university argues that by controlling the prices of its on-campus apartments, it can attract better Ph.D. students from the best undergraduate programs in the country and can pay them less than otherwise for their teaching and research assistantships. Moreover, the reputation of the university will be enhanced by the high-quality graduate students who help UC-Irvine faculty do their top-academic-journal research and who after graduation go out into the academic world and develop stellar scholarly records of their own, reflecting academic glory back on the graduates' degree-granting university.

Although the university seems convinced that much of what it does represents a positive contribution to society, it may take more credit than it deserves for the success of its graduate students. After all, high quality graduate students might be able to build substantial scholarly records even if they got their advanced degrees elsewhere, making the marginal contribution of UC-Irvine's programs more debatable than the university might want to concede.[9] Indeed, if the university didn't offer the students the price break on housing, thus lowering the overall costs of their degrees at UC-Irvine, at least some of the graduate students might have chosen to go to more highly rated universities (say, Stanford or Harvard) with fewer benefits but with better graduate educations and, as a consequence, might have been, after getting their degrees, in a position to develop even more stellar scholarly records.

This line of argument suggests that the UC-Irvine rental subsidies could be marginally undercutting the extent of some students' career successes. Put an-

other way, some students might be better off—given that with the rental subsidies they are able to maintain higher living standards while in graduate school—even though they might do less well in their careers were the rental subsidies not available. Alternatively, for those students whose parents are covering the graduate student bills of their children, the graduate student rental subsidies can show up in a higher living standard not for the students, but for the parents, with the parents' higher living standards captured, for example, in bigger and better cars or more frequent and longer vacation trips.

But then, there is a good chance that the university's rental price controls are themselves impeding the university's efforts to achieve the highest academic standards it can *with the available housing resources*. This is because with the rents well below market, graduate students have an incentive to "buy" more apartment space than they need, or at least more space than they would buy were they forced to pay market rents. A married couple with a child might rent from the university a two-bedroom apartment at $600 a month when one bedroom would do— if they had to pay the outside rental rate of $1,990 a month. Because of the subsidy, the available university land and floor space could be, and probably is, allocated among a smaller number of students than would be the case were rental rates set at market.

More importantly, graduate students get the $1,390 monthly subsidy for a two-bedroom apartment *only for as long as they are in school*. With the total housing subsidy tied to the students' length of stay, students are given a financial incentive to extend their graduate careers longer than otherwise, denying in the process the use of the limited number of apartments to other incoming students. Indeed, some married couples lucky enough to get one of the apartments have become "serial graduate students." After one spouse has strung out his or her graduate career for as long as possible, the other spouse applies for graduate admission, thus extending the couple's collection of the implicit monthly subsidies. As a consequence, 20% of the graduate students in the rent-controlled apartments have "squatted" in their apartments for twelve or more years.[10] Their extended stays no doubt have reduced the university's ability to attract good graduate students. The available housing has been taken by graduate student "squatters."

The university could easily remedy the "squatting" problem. The university could restrict the number of years students can stay in the apartments, but such a restriction has an obvious flaw: Some students in some programs need more time to finish their degrees than others. Would the university really want all students to be treated equally in terms of their tenure in student housing? If so, what should the restriction in years be? The number of years required to obtain a Ph.D. in management or the number of years required to get a degree in rocket science?

The university can rationalize the system by simply raising its rents to market levels. Those who valued on-campus apartments at less than the market rental rate, $1,990 a month, would look elsewhere for cheaper, far-removed-from-campus, and lower quality apartments, freeing university housing for use by students for whom location adds more value than the added rent. The squatting problem would go away, since students would not have the built-in subsidy incentive they now have to extend their graduate careers any longer than is really necessary. Apartments would be freed up for use by more and larger generations of graduate students who could be expected to complete their degrees in shorter time frames.

Now, it might be thought that the higher rental rates would scare off good graduate students. They could, and will, *if* there are no offsets to the higher rents set at market rates. Fortunately, the university could relieve the problems created by charging market rents simply by using its higher rental revenues to hike the payments made to students under its fellowships and teaching and research assistantship programs. That is to say, if the monthly rent for on-campus two-bedroom apartments is raised from $600 to $1,990, the university could award students $16,680 a year (12 × $1,390) more in scholarships or hike their pay by that amount under teaching and research assistantships. Granted, students may have to pay taxes on their additional income, but it should be stressed that the $16,680 in cash is worth more to students than the $16,680 embedded in the controlled rental prices, especially since graduate students typically have low incomes and are in low tax brackets. Cash would be preferred by students simply because the students would then have more choice over housing: they could decide to pay market rental rates for on-campus apartments or go off campus to comparable apartments at more or less the same rental rates. Of course, given that students could choose among on-campus and off-campus apartments, we might anticipate that the competition among housing developments on and off-campus would elevate the quality of apartments on campus over what the quality level would be when students have to take their subsidies only through renting on-campus housing. This means that by switching from in-kind/apartment embedded subsidies to cash subsidies, the university should be able to attract higher quality graduate students than with the in-kind rental subsidies.

Indeed, given that the cash is preferable to the embedded rent subsidy, the university can potentially raise the rent by $1,390 a month and then give higher quality students, say, $1,200 a month in cash with the result being that the students are better off than they would have been with the $1,390 a month in the rental subsidy. In this example, the university would then have $190 a month from each student given the cash subsidy to offer additional graduate students

fellowships and assistantships. The shift from embedded rent subsidies to cash subsidies is a potential win-win university policy change for everyone.

Why then don't state universities like UC-Irvine change their rent policies? The best answer is that university officials haven't read this book. Better yet, because the price of education (as well as housing) is subsidized, university officials are protected from competitive market pressures to find the most efficient pricing policies, but I am hardly satisfied with these answers. I was in one of my university's many administrators' meetings in which the topic of the shortage of graduate student housing was a prominent item on the agenda. The administrators barked one after the other:

- "We need more graduate student apartments to attract more and better graduate students."
- "We don't like the way the limited supply of apartments is allocated across departments."
- "We have a shortage of teaching assistants because of the university's apartment shortage."
- "Too many students are in their apartments for far too long."

When I interjected how many of the voiced concerns could be attributed to the rent controls and explained how market-based rents combined with more generous fellowships and assistantship payments could partially remedy many, if not all, of the problems mentioned, the administrators paused, but in short order continued their complaining about the shortage of student housing, dismissing totally my proposal as "free-market ideology." My proposal has nothing to do with any ideology, free-market or otherwise. It has everything to do with getting prices right (even in institutions that are as socialistic in basic structure as public universities), and, in the process, advancing the university's declared goals.

But then, the meeting gave me good reason to question if this analysis of the issue was complete, mainly because even the graduate students on the committee summarily dismissed the proposal, which I had assumed they would eagerly support. Why? A potential answer came from one of the executive MBA students when I related the meeting and arguments made at the meeting on graduate student housing. The student asked an insightful question: "What percent of graduate students actually seek on-campus housing?" Just for the sake of follow-

ing the logic implied in the question, suppose 40% of graduate students don't want on-campus housing, perhaps because they live in the area and have a working spouse with sufficient income to live away from campus (in a location closer to the working spouse's job, for example). Many graduate students might oppose the switch from the in-kind to cash subsidy system because the cash subsidy could be spread over far more graduate students, resulting in a substantial decrease in the subsidy going to students who are in a position to claim the in-kind/on-campus housing subsidy.

If instead of giving out cash subsidies, the university were to pass out "housing vouchers" (which give holders, say, 3 years of on-campus housing), then the vouchers could be sold by the students. Again, the housing rights would very likely be split among a larger number of graduate students, with the students who can claim the on-campus apartments receiving less in subsidies than they would receive under the current system. In short, these graduate students (who can be a majority of graduate students and who can be expected to be disproportionately represented on committees that consider the way the available apartments are allocated) have good reason to want to focus the subsidies on themselves through unlimited in-kind housing subsidies. In short, all of the grumbling about graduate student housing boils down to on-campus politics giving rise to some bad economics in the form of behavior-distorting prices.

FACULTY HOUSING SUBSIDIES

My university provides good analytical fodder for my classes and this book. This is because, like so many public institutions, it does many things that are not thought through, in this case the well-intended goal of providing faculty with reasonably priced housing (in a very high housing cost area of the country).

The university arose rapidly in the late 1960s on 1,500 acres of orange groves and pastures in Orange County, California. The university's land was given to it by the Irvine Company, which owned, in the early 1960, about 180,000 acres of prime Orange County land and which expected a new University of California campus to increase the commercial and residential value of the Irvine Company's remaining acreage. This remaining land would eventually be developed into the City of Irvine, which at this writing has close to 200,000 residents.

By the mid-1980s, having expanded to a student body of more than 10,000, UC-Irvine was facing growing pains, one of which was peculiar to the then (and for decades since) "hot" housing market in Southern California. The price of housing in Irvine and surrounding communities was rising far more rapidly

than were the state-controlled salaries of UC-Irvine professors. To continue to attract and retain top-quality faculty (in pursuit of its goal of becoming one of the top 50 research universities in the country, which it has since achieved), the university came up with an idea that many administrators and faculty members at the time considered ingenious: the university could use a few hundred of its then unused acres on the perimeter of its core campus to build faculty housing. The single-family houses and townhouses could be sold to faculty members at the cost of construction (not market prices). If the difference between construction costs and market value of a 2,000 square-foot house was $100,000 in 1990, the embedded subsidy on the house itself then amounted to about $6,000 a year (assuming a mortgage interest rate of 6%).

By the dictates of the land grant and charter, the university could not legally sell its land to existing or prospective faculty, but it could legally lease the land to the faculty member for 99 years at far below market—that is, subsidized—rates. A lot that might cost $250,000 in the Irvine community adjacent to the university property in 1990 might be leased to a faculty member as if the lot cost only $30,000. At 6%, the $220,000 differential between the actual land cost and the university lease value represents a covert annual subsidy of $13,200, an add-on to the faculty salary.

Total house and land subsidy in our example (which was close to reality in 1990): $19,200 a year ($6,000 in house subsidy and $13,200 in land subsidy), the equivalent to about a 50% increase in effective income for a full professor in the humanities and a 20% increase in effective income for a full professor in the business school. Again, the presumption was that the subsidy would enable the university to continue growing with better faculty than could otherwise be hired.

To make the plan work, the university, however, had to incorporate some resale restrictions. Otherwise, the initial new faculty members who bought their houses at cost (and leased the land far below market rates) could be expected to turn around and sell their houses to other incoming faculty or to people in the community at market prices. The faculty could run off with the capital gains that were supposed to go to a series of faculty members over the following decades. There were five major kickers to the housing contracts the university signed with faculty residents in what has become known as "University Hills" (and sometimes referred to as the "Faculty Ghetto"):

- First, the faculty members who bought University Hills homes could only resell their homes for what they paid for them, plus an appraised value of any improvements and an appreciation in the initial value of the homes equal to the increase in the consumer price index between the date of purchase and

the date of resale. For example, if a professor bought a house in 1990 at $200,000, never improved the house (beyond regular maintenance), and wanted to move to another university in 2007, that professor could only resell the house for $318,000 (given that the CPI rose by about 59% between 1990 and 2007).

- Second, the professor had to offer the house for sale first to existing or prospective UC-Irvine faculty members. If no faculty member wanted to buy the house, then the house could be offered to staff members. Only when no faculty or staff member wanted to buy the house could the house be offered for sale to people outside of UC-Irvine, and then the "outsiders" would be required to follow the resale restrictions. (Because there has always been an excess demand among UC-Irvine faculty and staff members, no University Hills track house has ever been sold to an outsider.)

- Third, faculty (or staff) members who leave the university without retiring from the university system have to sell their houses, following the above rules. However, retiring faculty members can stay in their houses for as long as they live. Their surviving spouses can also remain in their University Hill houses for as long as they live.

- Fourth, faculty members can rent their houses, but for no more than 2 years in sequence (which means that faculty members could only rent their houses when they go on sabbatical or on leave from the university).

- Fifth, faculty members' University Hills houses must always be their "primary" residence (which effectively requires faculty members to live in their houses more than 50% of any year).

University Hills housing was initially, no doubt, a factor in attracting good faculty members because of the implied housing subsidy, which is, effectively, an expensive fringe benefit. However, the improvement in faculty quality probably has not been as great as the embedded housing subsidy, taken by itself, might imply. This is because the subsidy has likely taken the pressure off the State of California to raise faculty salaries and other fringe benefits. That is, faculty salaries and fringe benefits have risen in real dollar terms over the last decade but, very likely, not by as much as they would have risen had the housing subsidies not increased the supply of qualified faculty members and held faculty salaries and fringe benefits down (below what they would otherwise have been).

However, given points made in our earlier discussion about the relative value of in-kind and cash subsides, it should be noted that to attract and keep any given quality faculty, salaries need not have been raised in 1990 by as much as the housing subsidies, which in the above example was the equivalent of $19,200 a year. This is because the housing is an in-kind benefit that is tied to the consumption of a given good, housing. A salary increase of $19,200 would surely be preferred by most existing or prospective faculty members over the exact same in-kind, housing subsidy. As with the student renters, the faculty member could take the cash, buy a house in University Hills, or use the cash to buy elsewhere in the area—or, for that matter, use the cash to buy a boat or car. If they bought houses in the surrounding communities, they could also gain from the ongoing housing appreciation in the area.

As it happened, the housing subsidy was and remains an inducement for faculty members to buy bigger houses and lease bigger lots than they would have bought had they been required to pay market prices for their square footage. Of course, this means that the available land has not likely accommodated as many faculty members and their families over the years as it could have accommodated were market pricing used.

The embedded housing subsidy has also likely caused faculty members who bought the larger houses to hang on to them longer than they otherwise would. Outside of the subsidized University Hills development, many parents whose young adult children move to places of their own do what comes naturally: they downsize their housing. The downsizing process not only reduces the housing costs of the homeowners with contracting family sizes, it also frees up the stock of larger houses to be bought by younger parents with growing families.

In University Hills, however, that process has been abated for two reasons:

- First, the large houses owned by downsizing families are cheaper than they would otherwise be. So, the downsizing families can be expected to continue to retain their "excessive" square footage, as has been the case. (There was one notorious case of a wife of a deceased prominent faculty member who held onto her five-bedroom/three garage house for years until she died in her eighties, in spite of the fact she lived only in the downstairs part of the house.)

- Second, since appreciation of the faculty housing has been capped by the rise in the consumer price index, faculty members with contracting families often have limited equity in their houses and, hence, have less to gain (than they would if their houses had been market priced) by moving to smaller and

cheaper houses and diverting their equity to other asset forms, for example, stocks and bonds.

One unfortunate, and unanticipated and unintended, result of the rules of ownership and resale is that the university has begun to lose younger faculty members to other universities because they can't move to larger houses in University Hills and can't afford to buy larger houses in the surrounding Orange County communities, where housing price increases have hardly been restricted to the rise in the consumer price index. The annual rise in the price of housing in Orange County since 1990 has been one of the highest in the country.

Indeed, between 1990 and 2007, the median housing price in surrounding Orange County communities appreciated by more than four times the rise in the consumer price index. This means that the professor who bought the $200,000 house in University Hills in 1990 could only sell the house for $318,000 in 2007, but if the professor did sell out, he or she would have to shell out in 2007 perhaps $1.2 million to $1.5 million to buy a comparable house in the surrounding Irvine community. The implied housing subsidy has, accordingly, jumped dramatically. Assuming a comparable house in the surrounding community is only $1.2 million and an interest rate of 6%, the price differential between inside and outside University Hills, in round numbers, is $900,000, or $54,000 a year in 2007—a subsidy, I might stress, that is collected year after year *only if the faculty member stays put.*

The growing disparity between the prices of houses in University Hills and the surrounding communities has resulted in many faculty members holding onto their houses after they retire. With the shortage in housing in University Hills, the university has used the available housing stock strategically, often offering the available houses to much sought-after distinguished professors on the so-called "priority list" who tend to be in their late forties and fifties, if not sixties. Many such faculty members can expect to spend more years in their houses retired than they spent in their houses during their active teaching and research year at UC-Irvine.

Because of the growing spread between the prices of houses in University Hills and in surrounding communities, the housing deals offered years ago have been described as "golden handcuffs." Many faculty members have no choice other than to stay put. Other faculty members who relocate after retirement to other parts of the country have an added incentive to use their University Hills homes as second homes (although they have to make sure that they follow the letter of the definition for "primary residence"). After all, their capped resell prices make their houses cheap places to own and to use on trips back to South-

ern California to enjoy the close-to-perfect weather no more than five miles from the Pacific Ocean, as well as the virtually bug-free environment (factors that help explain why housing prices are so much higher in Southern California than in most other parts of the country).

When I retire, you can bet my wife and I will hold onto our University Hills house for as long as either of us are alive. Why? First, my wife and I have a college-age daughter who thinks of our house as her homestead, a place to which she wants to return as she goes through her adult life. Second, when we decided to buy the house in University Hills, we freed up funds that were invested in securities. These financial assets have appreciated so that we could cash them in and buy another place in the community, but why should we? We would then be narrowing our investment portfolio with a larger portion being invested in housing, which implies added risk. More importantly, the shift of our assets from financial securities to housing would mean a shift of "income" from cash that can be used to buy many things to a single-purpose in-kind benefit, housing. We deem the cash from our investments more valuable.

The university now realizes it is in a housing bind, one that could have been anticipated with a little hard-nosed economic thinking, but, of course, wasn't. University Hills is "graying" as more and more faculty members retire and do what I plan to do—retire in place. Indeed, some faculty members jokingly call University Hills a retirement community—an academic "Leisure World" of sorts—because of the growing number of aging faculty in the neighborhood with canes and walkers. For the time being, the university has been able to bring younger faculty into the neighborhood, but only by building more houses. However, the available land for additional University Hills homes will soon run out—perhaps in as little as 5 years, long before the university expects to stop the growth of students and faculty—after which the graying of University Hills can be expected to accelerate, especially since the housing program will by then have been in place for 30 years, a tenure of service often sufficient to achieve maximum benefits from the university's defined-payment retirement plan.

What can be done to relieve the growing housing shortage (there are over 600 people on the waiting list at this writing)? Unfortunately, not much—short of allowing current homeowners to sell their houses at prices above the current pricing caps. If faculty members can only sell their houses well below market, where will they go? How will they pay for houses in the community?

If the university allows faculty members to sell at market (so that they can move out), then it might have a public relations problem of some magnitude, given that current homeowners would be allowed to pocket the capital gains associated with living on state property. But I don't see why such would be considered

any more unfair or inappropriate than the current system that allows identified faculty to garner the value of state property by continuing to live where they are.

Then, what other options does it have, once it uses the last acre of its "free" land—if it truly wants to continue to build the quality of its active faculty, not its retirees? One course the university has taken has been to elevate reminders of the "primary residence" requirement by investigating several supposed violations. Faculty members have also become neighborhood police squads, reporting on retired neighbors who do not appear to be meeting the residency requirement on the grounds that they don't seem to live in their houses very much, arguing that that it is "unfair" that unused houses are denying young faculty cheap housing. In other words, the price controls will make more and more faculty members neighborhood snoops and nannies, hardly an anticipated and intended consequence. But there is a question the nannies will have to ask themselves: Are the faculty members who use their houses only a few months of the year depriving young faculty members housing any more than the aging retirees (and their spouses) who continue to squat in their houses for decades after they retire? Did they not pay for the right to use their houses on a limited basis through their active years by suffering salaries below what they would have demanded, absent the housing benefit?

The solutions may now be limited. One possible solution might be to allow faculty members to rent their houses to other faculty members for long stretches of time. At least such rentals would make more houses available to more young faculty members for longer periods of time. That is, such greater leniency of the rental rules can result in greater use of the available housing stock.

In the end, the university might simply have to use donated or state funds to buy out professors from their University Hills houses at something above capped rates just to free up houses for the (supposedly) higher goal of continuing to expand and upgrade its faculty through the coming years. And why shouldn't it? The university has demonstrated that it will use an extraordinarily valuable university resource—land—to build its faculty. Why not use its donated real dollar resources to continue to do the same? Certainly there will be a cost. But the land used for housing was hardly ever "free," because the university could have leased the property (and any commercial units built on the land) and used the rents collected to pad faculty members' salaries (or do any number of other great things).

Now, if the university wants to free up houses, it will have to incur a cost of some magnitude. No escaping that fact of economic life. However, the cost of faculty buyouts will not likely have to be as great as the differential between housing prices in University Hills and surrounding communities. This is be-

cause some unknown number of retiring faculty members will want to retire elsewhere in the country, perhaps in places like Utah and North Carolina where housing prices can be higher than in University Hills but lower than in Orange County, or the rest of California. The university simply can offer a buyout price equal to a comparable house in the faculty members' retirement destinations. Granted, some retiring faculty members can be expected to game the buyouts system by proposing to retire in places with high housing prices, but such problems can be overcome with contractual provisions, at least to a degree, that payment will only be made if the faculty member relocates to where he or she indicates (and remains there for some specified period of time).

Alternately, the university can use a buyout auction system similar to the one airlines regularly use when they are overbooked. When the airlines need passengers to release their seats to people on the wait list, flight attendants will usually announce a "low" buyout price (say, a seat on the next available flight to the person's destination plus another roundtrip ticket to any of the destinations served by the airline within the continental United States). If an insufficient number of passengers accept the flight attendants' offer, then the deal can be sweetened (say, to two tickets to any destination in the world flown by any airline). The university can simply gradually up its buyout premium until the desired number of houses is freed up. Faculty members thinking about moving will be put into something of a competitive quandary that can cause them to reveal something close to their true minimum sellout price. When faced with the initial offer, you can imagine a faculty member thinking, "Should I take the offer on the table now or wait for a better one? If I wait for a better one, I could be left out in the cold, not able to get a premium price at all, because others have taken all available buyouts."

Okay, you don't like to apply market solutions to universities. Can you give me a better one? Renege on past-signed contracts and force aging faculty members to downsize their houses? That's a surefire recipe for lawsuits that can cost the university dearly. Suppose we limit by contract the years that newly arriving faculty members can stay in their houses. The university could also force new hires to accept a contractual provision that requires them to sell out when they retire. All you have done through such provisions is lower the value of the housing fringe benefit, which smart prospective faculty members should surely be able to figure out—*if university administrators making the rule change can figure it out*. Contractual limitations on the use of houses will have a way of feeding into new faculty members' starting salaries (or other fringe benefits) that will be higher than they would be without the housing forced-resale restrictions.

If only the university had thought through these pricing issues 30 years ago—if it could have.

CONCLUDING COMMENTS

There is a theme running through the discussion of various pricing puzzles in this chapter: "You can't fool Mother Nature, and you can't fool market forces" (at least not for long). Market prices for tradable goods, especially those with some durability like cars and houses, have a way of capturing the goods' disadvantages and advantages—and *changes* in those advantages and disadvantages. So it is that new car prices drop substantially when the cars leave the dealer's lot for the first time, partially because of the inability of the buyers (relative to dealers) to make a resale market for the cars they just bought. And new-car buyers need to understand that used-car buyers won't be fooled systematically into believing that used cars available for sale, as a group, are likely to have the same risks of repairs as new cars sold by dealers. If they are fooled, the pain of their purchases will no doubt lead them "as by an invisible hand" (Adam Smith's pat phrase) to correct the error of their buying ways. That is to say, the price differential between new and used cars can be expected, at least eventually, to reflect not only the wear and tear that goes with the normal use of cars, but also risk cost that goes with the prospect of used cars being lemons (or more defective than cars that people keep).

Similarly, if house buyers see value in views, that value will be reflected in the prices of houses with views. Prices, in other words, will absorb some (not necessarily all) of the value of the views, which is a solid explanation for why many people who value views don't seek properties with views (and often seek properties with big negatives, for example, an occasional natural disaster).

Also, this chapter has sought to drive home an easily overlooked lesson: when we try to help victims of natural (or even unnatural, for example, workplace) disasters through public aid, some, if not all, of the value of the help will be captured by hikes in the prices of assets owned by the victims. The aid that policymakers provide can also constrict future changes in public aid policies. Once the aid for natural or manmade disasters is captured (or capitalized) into the prices of property, then any withdrawal of the aid can give rise to a "disaster" of its own, given that the aid withdrawal can undermine the value of property as surely and as completely as the natural and manmade disasters that gave rise to the aid in the first place.

NOTES

[1] Akerlof (1970).

[2] Hecker (2003, p. 2).

[3] For more discussion on how policymakers can become constrained in their policy options by the so-called "Transitionary-gains trap," see an insightful article by Gordon Tullock (1975).

[4] Aguiar and Hurst (2004).

[5] Friedman (1957).

[6] Becker (1965).

[7] Aguiar and Hurst (2004).

[8] Aguiar and Hurst (2004).

[9] Dale and Krueger (2002).

[10] This data comes from reports made to the Graduate Council when I was a member.