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*Chapter Six*

# Habitability Laws and Low-Cost Rental Housing

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## INTRODUCTION

In 1970, 8.5 million households in the United States—one in every eight—inhabited substandard housing as defined by the Census, mostly rental housing.[1] Yet, as long ago as 1949, Congress had established a national goal of "a decent and suitable living environment for every American family."[2] We can identify a number of legislative responses to this challenge, including such federal programs as urban renewal, public housing, Model Cities, and rent subsidies. In addition, and often in isolation, state legislatures and the courts have instituted laws with the same purpose in mind. These laws have sought to modify the venerable one-sided relationship between landlord and tenant. Such modifications, be they common law or statutory, have been along two major lines of approach—habitability laws and continued tenure laws.

A substantial literature exists on landlord-tenant relations, but little work has been done to examine the economic implications of housing laws on landlords and tenants.[3] In this study, we provide a model for the evaluation of the costs and benefits of various habitability laws. In particular, we will evaluate laws on repair and rent deduct, receivership, rent withholding, and rent abatement, as well as laws for combating retaliatory eviction; all these are measures that reduce the risk borne by the tenant in procuring housing. Our objective is to determine the costs imposed by these laws and their distribution between landlord and tenant, as well as the resulting net costs or benefits.

We first present the major laws that regulate the relationship between landlord and tenant. We then offer some concepts and definitions designed to facilitate the analysis of the impact of habitability laws on rents paid by low-income groups. Next, we examine the allocation process for housing services within a demand-supply framework. We model the rental housing consumption process as well as the supply process. Finally, we develop an empirical methodology and present our results. In our empirical work we use a data file on landlord-tenant legal relations specially constructed by us and household data from the University of Michigan Panel Study of Income Dynamics for 1968-1972.

## LANDLORD-TENANT LAWS

Historically, most of the American states have subscribed to the early common law rule that landlords are under no duty to repair and maintain residential premises leased to tenants[4] or to deliver residential premises in a habitable condition. Moreover, since the rules of property law solidified before the development of mutually dependent covenants in contract law, a lessee's covenant to pay rent was considered independent of the lessor's covenant to provide housing. As a result, for example, if a tenant's home became uninhabitable, even though it was through no fault of his own, he could neither demand that repairs be made by the landlord nor escape liability for the rent due for the remainder of the term. Thus, the tenant had to pay rent regardless of whether he received any benefits from the residential premises.

A major modification of this traditional common law landlord-tenant relationship began soon after World War II. Basically, two approaches have been pursued, mainly through laws that assure tenants habitable housing and, to a lesser extent, continued tenancy (Hirsch et al. 1975).

In the first line of approach, many large American cities, by means of housing codes, shifted to the landlord the responsibility for repairing leased premises and maintaining them in habitable condition. The codes impose the burden of repair and maintenance on the landlord, while placing responsibility for cleanliness of the dwelling and specified minor items of maintenance on the tenant. Usually, the owner remains ultimately responsible for having housing code violations corrected. Parallel to these housing codes and in furthering their enforcement, courts and legislatures have created rights of actions of tenants. To this end, a number of legal remedies have been fashioned; they increase the property rights that are purchased by

tenants while concomitantly reducing those retained by landlords. These remedies, designed to provide a minimum level of housing quality to tenants, include repair and rent deduction, rent withholding and abatement, and receivership. They are often supplemented by provisions that prohibit retaliatory eviction, facilitate return of the tenant's security deposit, and legalize rent strikes. Furthermore, courts have recently begun to imply a warranty of habitability into urban residential leases.[5]

These recent changes in landlord-tenant relations, by implying and extending a warranty of habitability, automatically revise the doctrine of caveat emptor. Since certainty about the law has declined, previously nonexistent legal risks have arisen and the distribution of risks between landlord and tenant has been altered. For example, in the presence of caveat emptor, the landlord's obligations to repair and maintain premises are clear and, therefore, he faces few risks regardless of how little repair and maintenance he provides. At the same time, tenants face many risks, all of which change when the doctrine of caveat emptor is modified.

Without a warranty of habitability, there is considerable potential for variation in the level of service delivered to the tenant. Thus, the tenant's lease agreement is, for him, a source of risk. There are two sources of that variability:

First, there is the risk that the tenant has not correctly assessed the attributes of the dwelling before leasing. Here, the law would appear to economize on the cost of acquiring information, since the landlord is in the best position to evaluate his own property. Therefore, the law may be seen as requiring more complete disclosure of information, so that the tenant cannot claim that services he might reasonably have expected under the lease were not forthcoming.

Second, there is the risk that some damage to the dwelling will occur and reduce the flow of services during the period of the lease. When a habitability law is passed, the risk is transferred from tenant to landlord. In the absence of such a law, the tenant would be responsible for repair if he wished to derive the full benefits from his residence. To the extent that maintenance can vary, the tenant's consumption is subject to risk. Under the habitability law, risk is transferred to the landlord, whose profit is now subject to the variability of maintenance expenditures. The transfer of risk does raise serious questions as to who is the efficient risk bearer. Since the landlord may control many units, he therefore may have a smaller expected variation per unit. On the other hand, if the landlord's assets are specialized in housing, the total risk he bears may represent

a relatively large part of his total wealth. The poor tenant may be less averse to risk than the wealthier landlord. Thus, there seems to be no clear a priori basis for determining whether landlord or tenant will have a larger evaluation of the cost of avoiding the risk associated with the rental dwelling unit.

Let us next examine the major habitability laws. In Table 6-1, we indicate which laws were in force in early 1972 in the twenty-five states included in our sample.

Repair and deduct laws offer tenants a self-help remedy by permitting them, upon their own initiative, to repair defects in their

**Table 6-1. Habitability Laws, by States, 1972**

| *States in Sample* | *Repair and Deduct* | *Withholding* | *Receivership* | *Eviction* |
|---|---|---|---|---|
| Alabama | no | no | no | no |
| Arizona | no | no | no | no |
| California | yes | no | no | yes |
| Colorado | no | no | no | no |
| Washington, D.C. | no | yes | no | yes |
| Florida | no | no | no | yes |
| Georgia | yes | yes | no | no |
| Illinois | no | yes[a] | yes | yes |
| Indiana | no | no | no | no |
| Kansas | no | no | no | no |
| Kentucky | no | no | no | no |
| Louisiana | yes | no | no | no |
| Maryland | no | yes | no | yes |
| Massachusetts | no | yes | yes | yes |
| Michigan | no | yes[a] | yes | no |
| Mississippi | no | no | no | no |
| Missouri | no | yes | yes | no |
| New Jersey | yes | yes | yes | yes |
| New York | no | yes[a] | yes | yes |
| Ohio | no | no | no | no |
| Oregon | no | no | no | no |
| Pennsylvania | no | yes | no | yes |
| South Carolina | no | no | no | no |
| Texas | no | no | no | no |
| Washington | no | no | no | no |

[a]Welfare departments are authorized to withhold rent.

premises and deduct repair charges from their rent.[6] By 1972, this remedy was available in four states in our sample. It is basically limited to relatively minor defects.[7] Wide application of this remedy in a large multiple-unit dwelling could be inefficient compared to the result if the landlord undertook the repair and benefited from scale economies.

A second form of remedy is rent withholding, through either escrow or rent abatement. In the first case, the tenant pays rent into a court-created escrow account. Rental income is withheld from the landlord until violations are corrected.[8] Illinois, Michigan, and New York even authorize rent withholding by the state welfare department or some other agency. An alternative is rent abatement, which is more consistent with the application of contract rather than property law principles.[9] Rent abatement permits the tenant to remain in possession of the premises without paying rent or by paying a reduced amount until the housing defects are remedied. The condition of the premises constitutes a defense either to an action of eviction or to an action for rent. In most situations, the actual differences between withholding and abatement are very small. Even under abatement, rent is usually also placed into escrow, either as a good faith gesture by the tenant or because courts so order pending a full investigation of the existence and correction of code violations. Therefore, in this paper we lump abatement and withholding together as withholding laws. By 1972, such laws were in existence in ten of the states included in our sample.

A third remedy is receivership, i.e., appointment by the court of a receiver who takes control of buildings and who corrects hazardous defects, after the landlord has failed to act within a reasonable period. By 1972, this remedy had become available in six of the states included in our sample. If large-scale repairs are needed and cannot be financed through rental payments, some statutes permit the receiver to seek additional loans. When this is done, old first liens are converted into new second liens, imposing particularly heavy costs on lenders and, therefore, ultimately on landlords. Initiation of receivership is usually preceded by a hearing in which the court determines whether the landlord has failed to provide essential services. If the court so rules, the rent is deposited with the court-appointed receiver until the violation is corrected. As long as the tenant continues to pay rent into escrow, his landlord cannot evict him for nonpayment.

Altogether, courts increasingly imply warranties of fitness and habitability in urban residential leases. This implied warranty of habitability may be used as a defense in both actions of eviction and

actions for rent, if the tenant is able to show that a "substantial" violation of the housing code existed during the period rent was withheld. In addition, the tenant may have an affirmative cause of action against the landlord for breach of contract, while remaining liable for the reasonable value of the use of the premises.

Of the three remedies listed, receivership is potentially the most costly to the landlord. It results in a complete stoppage of rental income to him, since all tenants in the building, not only the aggrieved ones, pay rents into escrow. Moreover, the landlord altogether loses control over his building. Instead, control is temporarily transferred to a receiver who may be enthusiastic about fixing up the building, possibly even above minimum standards established by housing codes. The repair decisions are thus made without due consideration of their potential profitability. Finally, contrary to most repair and deduct and withholding laws, receivership is usually initiated by government, which has vast legal resources behind it.

The three major remedies are often supplemented by laws that can reinforce them. One is retaliatory eviction, which is designed to protect tenants from being penalized by landlords for complaining against housing code violations. Such laws, which usually freeze rents for ninety days after compliance, existed in 1972 in nine states of our sample. Furthermore, a number of states have laws that facilitate the return of the tenant's security deposit at the end of the tenancy. Finally, a few states have legalized rent strikes by tenants against a particular landlord.[10]

Laws that prohibit retaliatory eviction, facilitate return of the tenant's security deposit, and legalize rent strikes, like the other three remedies, impose costs on landlords. Parts of these costs may result from reduced flexibility given landlords, imposition of high repair and maintenance levels, and possibly legal costs. Of these remedies, retaliatory eviction laws resembling temporary rent controls tend to be the most costly to landlords.

In addition to these habitability laws, state legislatures have begun to pursue a second line of approach by assuring tenants continued tenancy, mainly through just-cause eviction statutes.[11] Under the latter, tenants can only be evicted for just cause, which is explicitly stipulated in the legislation. For example, such statutes in New Jersey (New Jersey Stats. 1974) delineate a limited number of legal grounds which would constitute the sole basis for eviction: failure to pay rent; disorderly conduct; willful damage or injury to the premises; breach of express covenants; continued violation of landlord's rules and regulations; landlord wishes to retire permanently; or landlord wishes to board up or demolish the premises because he has

been cited for substandard housing violations and it is economically unfeasible for the owner to eliminate the violations.

Like habitability laws, just-cause eviction statutes reduce the property rights of landlords, particularly their flexibility in renting out their apartments. We do not deal with just-cause eviction statutes in this paper, but we note that such laws impose costs on landlords both because the statutes extend the warrant of habitability and its enforcement and because tenants assured of continued occupancy can feel free to use all available legal remedies to obtain from landlords relatively high levels of repair and maintenance.

Habitability laws can be viewed as rules of contract that change the nature of the permissible contract. One simple interpretation is that the habitability law constrains actors to contracts in which the landlord bears the risks associated with repair and maintenance, while without that law the form of the contract is not constrained. If such an interpretation were correct, then a strong a priori case could be made for the inefficiency of habitability laws. However, it is equally likely that under caveat emptor, the consumer is constrained from purchasing a desired bundle of housing services that includes warranties. Such would be the case if high transaction costs interfered with an efficient reallocation of rights. The reasons are that deviations from a standard contract are costly and enforcement of any warranties purchased would be difficult under general application of caveat emptor. Finally, it may be that a contract that obligates the landlord to maintain the premises is efficient and has already evolved as the standard relationship between landlord and tenant, and that the habitability law merely provides legal recognition of this so as to reduce enforcement costs. These alternative interpretations each imply a different conclusion regarding the efficiency of habitability laws, and therefore provide the motivation for the empirical investigation undertaken below.[1 2]

## CONCEPTS AND DEFINITIONS

Of central importance in the housing market analysis is the time period allowed for landlords and tenants to respond to changes in prices or other circumstances. Thus, attention must be given to the time period relevant to housing demand and supply. Clearly, the answers to hypothetical questions such as how much housing a group of households would consume at different rents, and how many rental units a group of landlords would put on the market at different rents, will depend on the amount of time that the decision maker has to react to changes. For example, if prices go up, by

tomorrow the landlord can offer for rent only the units he owns today; by next year, he can acquire facilities and convert them to a particular application. At present, there appear to be two polar treatments of the supply of housing in the legal literature, an extreme long-run case by Komesar (1973) and a short-run case by Ackerman (1971).

The time period has a bearing on the expected distribution of costs. Thus, for example, traditional long-run models provide an easy answer to questions about the distribution between landlord and tenant of costs that might result from compliance with additional housing laws. In the competitive case with infinite time to make adjustments by means of new construction, the supply of housing is a horizontal or near-horizontal line at the price equal to the cost of providing housing services (de Leeuw 1974). Thus, in this simple case, the supply shifts upward to reflect the additional costs associated with the law. The effect on rental price is then equal or approximately equal to the change in costs. This would occur whether or not any benefits were received by the tenant. The traditional long-run case leaves us with only the question of evaluating the benefits and costs. The distribution of costs is unambiguous, i.e., the tenant pays all additional costs.

However, this absolute long-run model, while perhaps useful for analyzing investment decisions, is less than satisfactory for our analysis of housing markets. One of the aspects of housing that qualifies it for a more distinct analysis is the durability of the commodity. For assets as long lived as housing structures, full adjustment to a change in environment may take more time than any particular set of circumstances lasts. The durability of housing structures leads to a second approach to the problem, where the supply of housing is treated as being perfectly inelastic. For example, in Ackerman, the assumption is made that the structures are in place and that they will be rented at some price rather than allowed to remain vacant. If a new law results in losses, the properties are simply revalued downward with a once-over loss to the landlord; but the property will remain in the rental market.[13]

This short-run model might be applied to certain pricing decisions, but it begs most of the important questions of concern to us. Clearly, if we assume no possible reaction by landlords, we will have no trouble concluding that the landlords' reactions will not lead to higher rents. It can, however, be argued that changes in the number of units will be small in the short run. This is particularly true for low-quality housing, if the appropriate response of supplies to the change in the law should be to withdraw units from this submarket,

since upgrading to a higher quality is often quite expensive. Filtering down of higher-quality categories may be curtailed, but the effect will be small, since it is the consequence of construction and maintenance decisions made many years in the past and of environmental factors not under the control of landlords. For these reasons, it is not unrealistic to define, for the purpose of analysis here, a quasi-long-run period in which both the number and character of structures vary, but in which adjustment in the construction of new units has no bearing on the stock of low-quality structures. We are seeking a housing quality model that will allow the landlord to react by varying either housing quality or, as we will show below, the quantity of housing services, while not actually changing the number of dwelling units. Such a change will occur for the low-quality range primarily by varying the maintenance effort, which is the primary form of adjustment in our quasi-long-run model. It is widely observed that the type of management that an apartment building has will have an important impact on the quality of housing services and on the neighborhood as well if management practices are similar within the area (Sternlieb 1966). Much of the effect of management relates to the making of needed repairs and the frequency and quality of routine maintenance.

In summary, then, we will seek to build a model to evaluate the effects of a change in the legal environment on the housing market, particularly the low-cost rental housing market. It is a realistically quasi-long-run model in which the total low-cost housing stock is not completely free to vary, but other dimensions of landlords' behavior, mainly housing quality changes, are unconstrained.

We turn now to the quantity and quality dimensions of housing. Above, we used the word "quality" as we believe it to be conventionally understood; that is, as describing the essential character, the goodness or badness, of the commodity. Thus, a higher-quality unit is somehow "better," i.e., imparts greater service, than a lower-quality unit of equivalent size. Nonetheless, such a definition is far too vague and, to a degree, misleading. Any particular aspect of a dwelling, be it paint, heat, size, location, etc., can be regarded as a distinct economic commodity, and variations in these commodities are variations in the amount of goods being consumed by the individual occupying the dwelling. We aggregate over these commodities and summarize by denoting as "housing services" all of those characteristics taken together. Then a better dwelling, be it larger, in better condition, or both, is said simply to deliver more housing service (Muth 1969, and others). Given this definition, we can speak of quality as being the amount of housing service contained in a

dwelling. In particular, the decision by a landlord to provide high or low quality in a particular dwelling is equivalent to the decision to provide more or less housing service.

Having defined the commodity with which we are concerned, i.e., housing service, we turn next to the problem of measurement. Measurement will be facilitated through the estimation of weights for the components of housing service, as shown below.

Rent payments represent a price multiplied by a quantity; in the market we observe expenditures rather than prices. For homogeneous commodities, this problem is solved by simply dividing observed expenditures by the quantity purchased. For housing there is no easily observable quantity. Rental payments can be regarded as the sum of payments for a number of characteristics, or,

$$R_j = \sum_{i=1}^{n} \alpha_i x_{ij} \tag{6-1}$$

where $R_j$ is the rental payment for the $j$th dwelling unit, $\alpha_i$ is the price of characteristic $i$, and $x_{ij}$ if the quantity of the $i$th characteristic contained in the $j$th dwelling unit. The above represents a standard expression of the hedonic price approach. Unfortunately, this is not sufficient for our case. Hedonic prices represent outcomes of interactions of supply and demand. Because we are looking across cities, we have many supply and demand relationships and therefore we cannot expect uniform $\alpha_i'$s to apply for all observations. As a result, we must depart from the usual approach in order to incorporate those variables which enter the model through their differential effects on supply and demand across cities:

$$R_j = \sum_{i}^{n} \alpha_i x_{ij} + \sum_{i}^{m} \beta_i y_{ij} + \sum_{i}^{1} \gamma_i z_{ij} \tag{6-2}$$

where $y_{ij}$ is a factor determining the demands of the $j$th household and $z_{ij}$ is a factor determining the supply of housing in the city in which the $j$th household is located. (The specific variables used will be discussed below, where the supply and demand processes are treated.)

Assuming that the values of the characteristics are successfully observed, what are the prices associated with individual observations for the analysis of supply and demand? The usual hedonic price approach would appear to summarize all prices, leaving us the same price for every unit in our set of observations. This difficulty is overcome when it is recognized that the coefficients of character-

istics in our system are not prices, as they would be in the usual hedonic price approach, but merely weightings that explain a part of the variability in the observations of housing expenditures. In particular, the products of the hedonic price coefficients times their respective characteristics explain that part of the variability in the observations which is due to variations in the quantity of housing services received by each household. In evaluating prices for housing services, we wish to include the variation due to supply and demand and exclude variation due, for example, to differences in number of rooms, soundness of the building, etc. We can do this by dividing rent by the product of the weighting from Equation (6-2) multiplied by the characteristics present in an individual dwelling unit. Rothenberg (1974) does so, using actual rents, and calls the denominator "hedonic value." Then the quotient, which he expresses as the ratio of market value to hedonic value, is conveniently interpreted as the price per unit of hedonic value or, simply, the price per unit of housing service.

It is useful at this point to relate our formulation to current work by others on hedonic prices. In particular, we wish to show how the cross-cities setting that we must use is inconsistent with the usual hedonic price approach. However, the inapplicability of that approach is of no importance to our efforts; our objective is not to explore the different supply and demand environments for attributes of dwellings but simply to observe the supply and demand for housing services in general.

We have noted that the coefficients of characteristics are not prices. This qualification is not the same as the statement by Rosen that hedonic prices are not literally prices, since there exist no opportunities to trade characteristics at constant prices (Rosen 1974). In his setting, while the characteristics coefficients are not prices, the hedonic price equations are argued to contain the information that consumers and producers respond to. In this study no such argument can be made. First, no set of characteristics prices prevail for all cities. Second, the estimation process that we use precludes the observation of marginal price relationships, although they might exist within housing markets.[14]

Looking at residences in separate markets, we find that differences in market supply and demand variables are a major source of variation in expenditures for housing. To delete these variables from the first step of the estimation would bias the characteristics coefficients, in case characteristics were correlated with any of these other variables. However, by including the market supply and demand conditions in the equation, we remove the effect of these

factors on those coefficients. Thus, the coefficients lose all similarity to prices. This is desirable, since we are interested only in the relative valuation generally placed on the characteristics by consumers.

We can demonstrate the constrasts of the two approaches with an example. Let us say that a locality has, over time, depleted nearby supplies of lumber. Consequently, increasing amounts are imported, resulting in price increases. In the normal setting, this change would require an increase in the price or evaluation of structural attributes such as size, number of rooms, etc. In our setting, we would want the weightings of these characteristics to be unchanged as a result of the changing supplies of building materials. We want only to be able to determine "how much house" is present in the first step of the hedonic value computation. Later, we will use this information to conclude that indeed "this much house" is more expensive in that city, now that lumber is more costly, since we will observe a high ratio of price to hedonic value for dwellings there.

The underlying motivation of the two different approaches explains the difference in methods. Rosen seeks to disaggregate total payment by observing characteristics. We seek an aggregate measure of value, but we can observe only the disaggregate values of the characteristics, so we aggregate over these.

## THE ALLOCATION PROCESS–SUPPLY AND DEMAND

In the above, we discussed two of the problems that are usually identified as sources of difficulty in dealing with housing: the problem of measurement and the durability of the housing stock. A further consideration is market structure.

Though we may speak in terms of homogeneous "value units," the consumer in fact is choosing among a set of heterogeneous commodities. That is, each particular dwelling unit has a unique set of attributes, especially with regard to its location. In fact, this has led to the observation that each landlord is a monopolist for the particular dwelling unit owned by him. In that case, no supply function relating housing service to prices will exist. Yet, the housing market is not monopolistic in the usual sense of the term; many producers provide commodities that are close substitutes for one another. It can be argued that under such circumstances the landlord will tend to accept the highest bid for his dwelling unit and will provide a package of housing attributes intended to maximize his profits. Given these considerations, we can diagram the quantity choice problem as presented in Figure 6-1.

The diagram is similar to that used in determining optimum

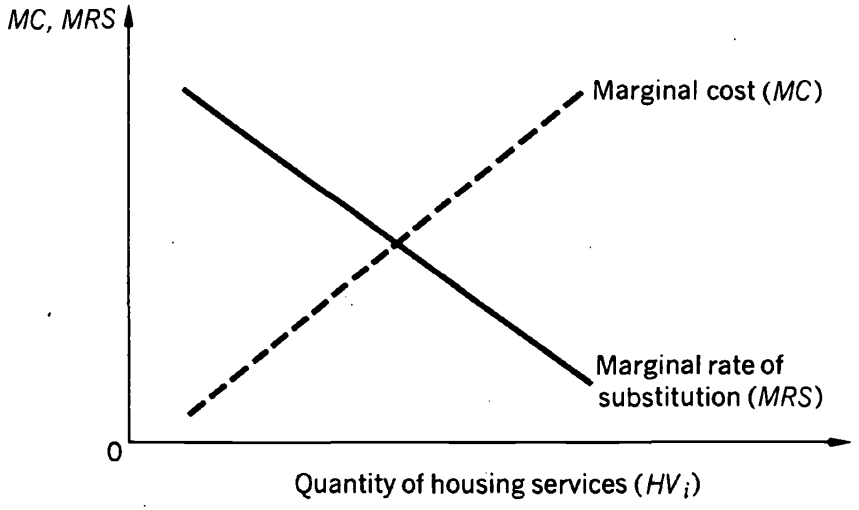



**Figure 6-1.**

output for a perfectly discriminating monopolist or for determining the net benefit maximizing output for a public agency. In short, the landlord will provide additional services so long as the tenant's marginal evaluation is greater than the marginal cost of the services. In what follows, we provide a more detailed explanation of the marginal cost and marginal evaluation functions. It is important to note that these are not conventional supply and demand functions, although they do reflect supply and demand processes. Furthermore, they can be used in much the same way as conventional supply and demand relationships to evaluate the market impact of housing laws.

### The Housing Consumption Process

The consumption process of the household in this framework is somewhat different from that of traditional approaches. As discussed earlier, market prices and variable quantities of a housing commodity are not available to the household; thus, maximization of utility by the household with a linear budget constraint, given market prices and a level of income, is not possible.

Given the above derivation of a value measure and constraints on market information, the household consumption problem can be formulated as follows:

$$\max U(HV_i, X) \text{ subject to } Y = P_x X + [P(HV_i)] \qquad (6\text{-}3)$$

where $P(HV_i)$ is the nonlinear housing value or total bid; $HV_i$, a measure of housing; $X$, all other goods in the market; $Y$, household income; and $P_x$, price of nonhousing commodities.

The solution to the above problems follows that shown first by Alonso (1964) and later by Wheaton (1974) and Rosen (1974). The bid-rent framework involves a production decision, which we assume here to be given, and a consumption decision process. This process is tractable given the information problem discussed above, and it can be shown to have close theoretical ties with standard utility analysis.[15] Given Equation (6-3), the solution to the choice quantity of housing service ($HV_i$) is that point at which the household's marginal rate of substitution for housing and other expenditures is equal to the bid value for an additional value unit of housing.

In graphical terms, if $\Theta(HV_i; Y, u^*, \gamma)$ expresses the "willingness-to-pay" curves of a household, given income, a utility level ($u^*$), and personal attributes ($\gamma$), the optimal choice is at $A$ (shown in Figure 6-2), where the household's marginal valuation equals the marginal cost of housing service ($HV_i$).

It should be noted that the bid-value curves hold income, the

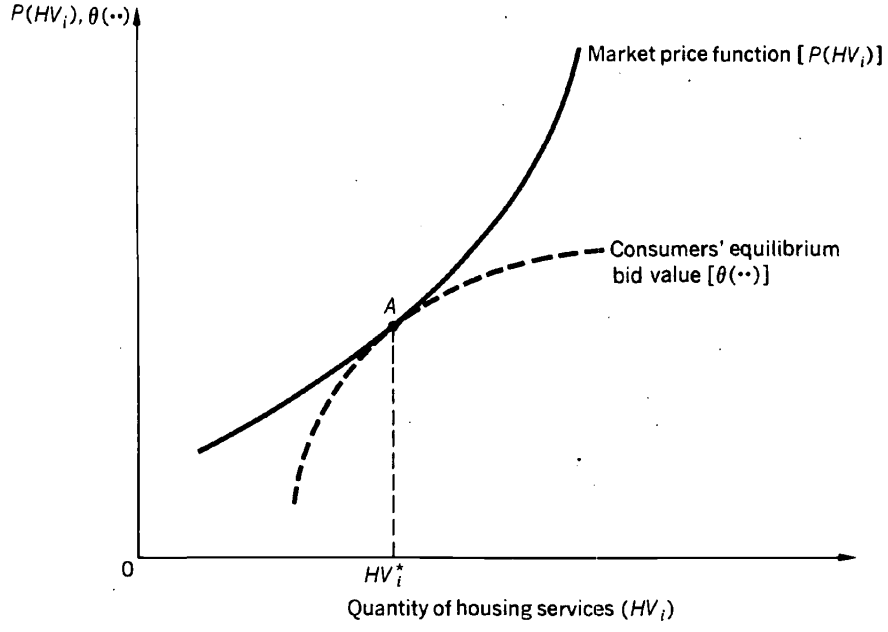



**Figure 6-2.** Solution for Consumer.

chosen level of houshold utility, and personal attributes constant.[16] Assumptions for achieving a solution include a high degree of independence in the bid-value process and convexity and regularity of $P(HV_i)$. (These assumptions are not modified in this discussion.)

An interesting variable in the willingness-to-pay function, $\Theta$, is the set of personal attributes, $\gamma$. By varying $\gamma$, different $\Theta$ curves can be found for well-defined groups of individual households. By segmenting households in this way, the assumption can be eliminated that all households have utility functions of the same form. An assumption about personal attributes is stated later in this section.[17]

To interpret the bid-rent approach, the following factors are relevant. Households are assumed to be making a kind of offer on every rental housing unit that leaves them equally well off no matter which offer is accepted. This is consistent with the choice of a $u^*$ in the $\Theta$ function. Equilibrium is obtained when the values are such that every unit is occupied by the highest bidder. If an individual household is the high bidder on more than one unit, it submits bids which are lower for all units, again such that it is indifferent as to which of the bids are accepted, thus obtaining a higher level of utility than it obtained with the previous bids. The bidder who is not high on any unit can reevaluate its needs and submit a set of higher bids, that is, it can bid along a lower indifference curve, each bid representing for it a choice between housing and nonhousing consumption.

Within the above setting, we regard the household's decision-making process as moving along an indifference curve as it exchanges housing services for nonhousing consumption. Doing so, the household pays according to its marginal rate of substitution of housing for other expenditures for each successive unit of housing service.

We assume that individuals with similar personal attributes can be identified and that landlords are aware of these attributes and react to them. (This view is not unrealistic, since landlords commonly do have some expectations about the income, family size, and ages of potential renters and tend to tailor their housing units to this clientele.)

As described, an optimal bid-rent function for an individual household will depend on the income and personal attributes of the household and the level of bids of other households in the locality. The bids of other households can be assumed to vary across cities primarily by differences in income, thus giving a nonuniform set of $P(HV_i)$ values. These values most likely reflect different marginal cost curves, and therefore, no clear tracing of a housing supply curve may result. This interaction could, however, be explained by the simultaneous decision processes of suppliers and consumers.

As described above, the observed value measure derived from the ratio of rental value to hedonic value is an average evaluation, *not* a marginal one. This does not, however, create an empirical problem, but does require a different interpretation of regression coefficients. Clearly, we can solve for a marginal evaluation, given a linear relationship between average evaluation and quantity. The empirical relationship to be estimated then becomes:

$$\frac{R_j}{HV_j} = f(HV_j, \text{household income, average income of other households in the SMSA, laws applying to the SMSA}) \quad (6\text{-}4)$$

where $R_j$ is the rent of the $j$th household and $HV_j$ is the hedonic value of the dwelling occupied by the $j$th household.

### Supply

Having introduced the bid-rent process in the previous section, we can demonstrate an analogous supply process quite briefly. Here, the supplier is viewed as confronting a fixed price function $P(HV_i)$, an assumption equivalent to the assumption that competitive firms confront constant prices. Obviously, the assumption cannot be literally true in either case, but probably reflects accurately the supplier's perception that individually he has little influence on market prices.

We can express the decision of the supplier as follows:

$$\max \pi = P(HV_i) - C(HV_i, P_i, D(M), L, B) \quad (6\text{-}5)$$

where $M$ is maintenance, $D(M)$ relates maintenance to depreciation, $P_i$ is a vector of input prices, $L$ is legal costs, and $B$ is a vector of other characteristics of the producer.

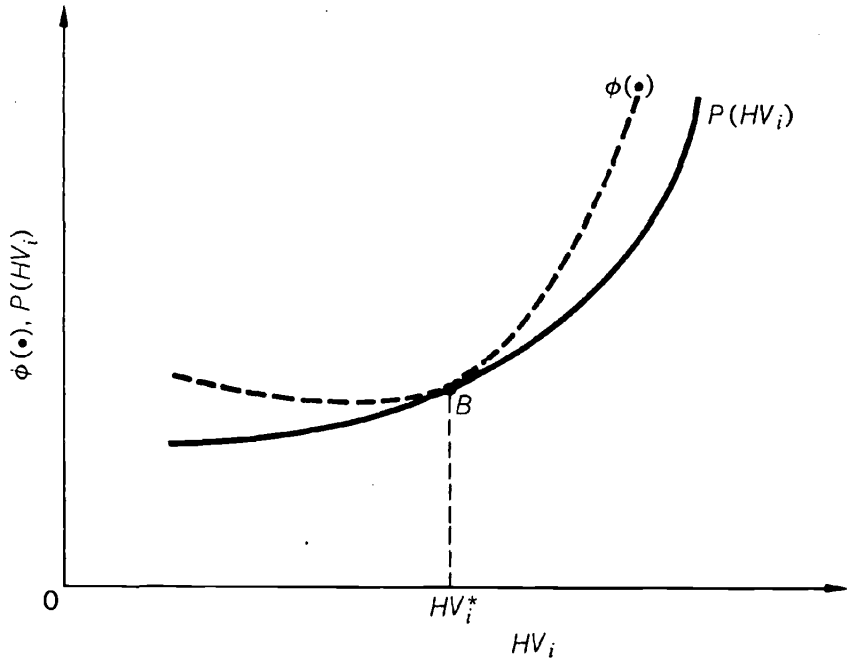
In the supply setting, the bid curves represent equal willingness to supply. Thus, for each supplier, we can define the function that solves Equation (6-5) for any specified $\pi$ for values of the exogenous variables appropriate to the supplier. We define $P = \phi\,(HV_i; \pi, T, P_i, D(M), L, B)$ as representing points of equal profit for the landlord. As before, equilibrium is attained where the bid function is tangent to the $P(HV_i)$ function, since higher $\phi\,(\,)$ are obtained for higher values of $\pi$ while holding all other variables constant. The result is shown graphically in Figure 6-3. Since $\phi\,(\cdot)$ represents points of constant profit, any particular $\phi\,(\cdot)$ is simply the total cost function plus some constant. Therefore, where equilibrium is obtained, marginal cost must equal the marginal price of $HV_i$.

As in the usual competitive model, high profits are assumed to attract new entrants into the submarket, i.e., additional offerers are created at a point such as $B$ along the $P(HV_i)$ curve. With this, consumers will resubmit bids so as to be high bidders on only one unit. This shifts $P(HV_i)$ downward, and producers will then obtain an equilibrium on lower isoprofit contours.

For an individual producer, the equilibrium relations can be shown more easily by differentiating $P(HV_i)$ and $C(HV_i)$ and using the marginal relationships as in Figure 6-4. $C'(HV_i)$ is the marginal cost of current housing services or marginal current expenditures net of their effects on future revenues and legal costs. $E(HV_i)$ is the total expenditure for providing current housing service $H$. Thus,

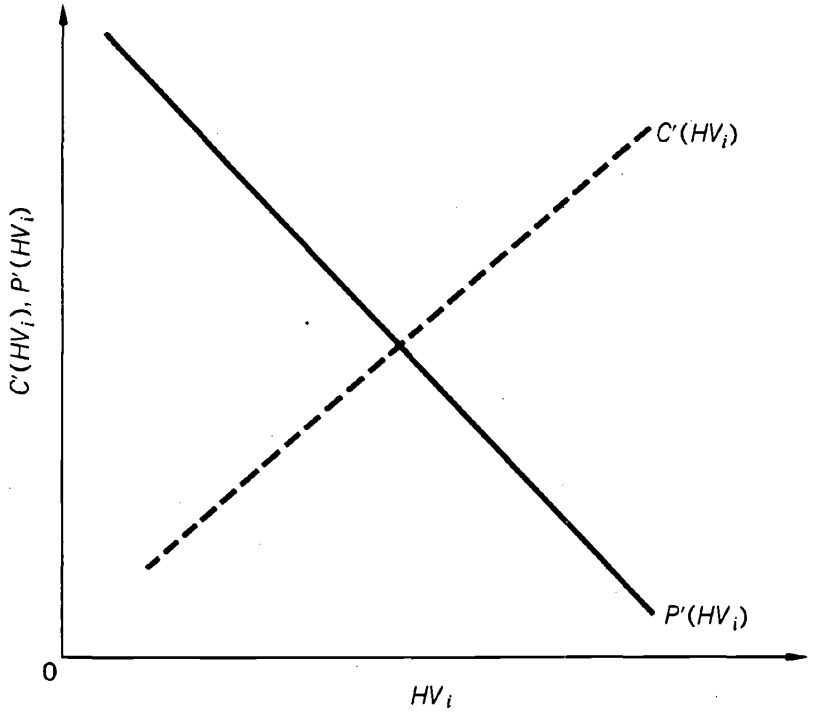
$$C'(HV_i) = E'(HV_i) - D'(M) - L'(HV_i) \tag{6-6}$$

where, $L'(HV_i)$ relates legal costs to the level of services provided and




Note: For definition of variables, see Figure 6-2 and text.

**Figure 6-3.** Graphical Solution for Producer.




Note: For definition of variables, see Figure 6-2 and text.

**Figure 6-4.**

$D'(M)$ relates the future value of the structure to current capital expenditures on the dwelling unit.

$D'(M)$ is negative; hence $-D'(M)$ can be interpreted as the savings in depreciation attributable to a unit of maintenance input. The interpretation of the condition then is that the landlord increases maintenance up to the point where the marginal evaluation of quality derived from a unit of maintenance plus the savings in depreciation equal the price of the maintenance input.

The legal cost function would presumably be a decreasing function of maintenance. However, the relationship cannot be observed because we lack essential information on, for example, the number of cases filed and their cost. Furthermore, there are difficulties in associating the probabilities of case filing with various levels of maintenance. We estimate the differential impact of the legal environment by distinguishing between populations according to the laws

implemented in each case. In this sense, the legal cost function provides the rationale for distinguishing between the two populations, those that have and those that do not have the particular law, and predicts the effect of laws on the supply of housing services. The legal cost function includes all costs imposed by the legal system, including any penalties that might result from noncompliance. Thus, the legal cost function reflects the incentives for provision of a higher level of service than the law might require.

Our expectation is that landlords supply less housing service at any particular price, if circumstances change so as to increase their costs or to make the supplying of housing a less desirable activity than it had been. Yet, the effect of the legal cost function itself acts to increase incentives to provide services. However, the law does affect the landlord's expectation that his property will continue to be used as a dwelling by altering its expected future profitability, and therefore the law affects the expected return to the landlord from any current maintenance expenditures.

In our investigation, we have so far been attempting to identify variables that would provide information regarding the comparative productivity of maintenance expenditure among cities. Our approach has been to identify the factors that probably have an impact on landlord's future returns from current maintenance expenditures. One factor, as discussed above, is the status of housing laws. A second important factor is the value of land: where land values in a city are high, one would expect that the remaining life of low-quality dwellings will be short, since it is likely that with further deterioration the structure will become more profitable in other uses. A third variable is the relative prices of dwellings in different quality categories. This should indicate the reduction in the landlord's revenues that would occur if the quality of the unit is allowed to decline. A final variable, the number of vacancies in the lower-quality categories per low-income renting household, also should indicate the opportunities confronting a landlord and, therefore, his willingness to allow units to filter down.

## IMPLEMENTATION

The conceptual framework that has been presented allows us to formulate empirical supply and demand relationships. In this section, we provide a description of the data and basic structural relations of the model and some results.

### Data and Structural Considerations

Most of our housing data, i.e., housing characteristics and house-

hold descriptions, were taken from the University of Michigan Panel Study of Income Dynamics (University of Michigan 1972). A primary advantage of these data over Census data is that the former provide current housing information that can be combined with current legal information. The University of Michigan sample is large enough to permit separation of low-income households from other types of households in the rental housing market. The variables are defined and their sources are given in Table 6-2.[18]

Several of the variables found in that table are based on observations for an SMSA. If, for example, several separate households are

**Table 6-2**

**Table 6-2. Description and Source of Variables**

| *Name of Variable* | *Description* | *Source* |
|---|---|---|
| *RTIL2* | Sum of annual household rent plus utilities paid in 1972 | 1972 Michigan survey |
| *ROOM2* | Number of rooms in the dwelling | –Do.– |
| *DIST2* | Distance of housing structure to the center of the SMSA | –Do.– |
| *STRU2* | Structural type | –Do.– |
| *AVGI* | Average household income for a five-year period, 1968-1972 | 1968-72 Michigan survey |
| *LOT* | Average lot value of equivalent sites in SMSAs | FHA (1973) |
| *DEPR* | Ratio: tenth percentile rental unit price to median rental unit price | Census (1970) |
| *RENTY* | Median SMSA household income for renters | Census (1970) |
| *SMSAY* | Total per capita income for the SMSA | –Do.– |
| *CONCOST* | Costs of construction for brick-concrete apartments across cities | 1972 Boeckh index |
| *HEAT* | Average annual heating cost per room for rental units in an SMSA | Apartment building income, expense analysis (IREM 1972) |
| *REDUCT* | Identifies states with repair and deduct housing laws | Hirsch et al. (1975) |
| *RWHOLD* | Identifies states with both retaliatory eviction and withholding laws | –Do.– |
| *RECEIVE* | Identifies states with receivership laws | –Do.– |
| *VACPER* | Number of vacancies below median divided by number of low-income renters | Census (1970) |
| *PTAX* | Property tax per household, average for the SMSA | Census (1970) |
| *RPOP* | Number of low-income tenants in the SMSA | Census (1970) |

located in a particular SMSA, the data recorded for each observation will be equivalent. In a situation where differences in household rents in different SMSAs are observed, this is not important. However, when rental payments by households in one defined SMSA are being explained by such a measure, the explanatory power of the system will be small. Since both types of observation are included in the model's data base, the effects of this insensitivity may be important.

The use of dummy variables related to the law and housing variables is necessitated by the lack of data on the status, nature, and effects of laws. In particular, data on enforcement or direct legal costs and on knowledge of laws are unavailable. Dummy variables are therefore used to distinguish states and housing locations with habitability laws from those without such laws. These distinctions can also be used to indicate places where legal costs are imposed versus places where they are not, if we assume that knowledge and enforcement exist and realize that magnitudes of such costs are not distinguished.

The housing model described in the theoretical section has several components. The first is an estimation of a household rent equation. The dependent variable, rental payments ($R$), is regressed on four classes of variable:[19] housing characteristics ($HC$), demand factors ($DF$), market supply factors ($SF$), and landlord-tenant laws ($L$), i.e.,

$$R = f(HC, DF, SF, L) \tag{6-7}$$

This is a reduced form equation that has a direct relationship to other structural equations, i.e., to household consumption and landlord supply. Since differences between housing payments among and within cities are included in the data base, the purpose of the $DF$ and $SF$ variables is to take account of those market variables so that the estimated value of defined housing characteristics can be aggregated regardless of location.

A second purpose for estimating Equation (6-7) is to identify the effects of landlord-tenant laws on rental payments and to test the significance of the estimated coefficients of the law variables. Hypotheses related to both the impact and significance of such laws can be tested in terms of sign and values.

It is interesting to note that if

$$\hat{R} = \sum_{i=1}^{n} \alpha_i x_i \tag{6-8}$$

aggregate value of defined housing characteristics, where $\hat{R}$ is a quantity proxy for housing, and $R/\hat{R}$ is a price measure, there are two well-defined structural equations:[20]

$$\text{Consumption: } R/\hat{R} = g(\hat{R}, HDF, L) \tag{6-9}$$

$$\text{Supply: } \hat{R} = h(R/\hat{R}, HSF, L) \tag{6-10}$$

where $HDF$ = housing demand factors and $HSF$ = housing supply factors. These variables represent subsets of the larger vectors, $DF$ and $SF$, in Equation (6-7). A nonsignificant relationship between rent and law variables may not reflect similar insignificance at the structural equation level. To guarantee a similar result on both levels of estimation a perfectly identified or specified system must exist—an unlikely condition.

The preceding statement is intuitively reasonable because the dependent variable is rental payments $[(R/\hat{R})\cdot\hat{R}]$ in the rental payments equation, whereas the dependent variables are $R/\hat{R}$ and $\hat{R}$ in the structural equations.

Suppose rental payments for a defined housing quantity are \$100 in a location without a tenant-landlord law and \$104 in a location with a law. In a regression, there would be little significance to the law, but suppose that demanders were unaffected by the law (i.e., no demand curve shifts occur), but suppliers had increased marginal costs (reflected in a supply curve shift). In graphical terms, with inelastic demand, a shift in the supply curve with no shift in demand could reflect a significant effect of the law on suppliers and little effect on rental payments (see Figure 6-5).[20]

Two other factors that seem important in determining the significance of the hypothesized relationship between laws and rent are the definition of the law variable(s) and the subpopulation of households being investigated. For instance, if all housing laws were aggregated and a single law variable defined, different information would result than if various types of housing laws were defined and investigated.[21] Comparison between subpopulations, e.g., aged and young households, could lead to different results depending on mobility and other demand factors of the household. This may mean that the household's demand relationship for some groupings accounts for a dominant part of the rental payment-law relationship.

### Results of the Rent Expenditure Equation

On the basis of the current understanding of the low-cost rental market, the following relationships in the reduced form rent equation are expected:

The *number of rooms* within a dwelling is expected to be positively correlated with annual rent (the larger the dwelling, the higher the expected rent).

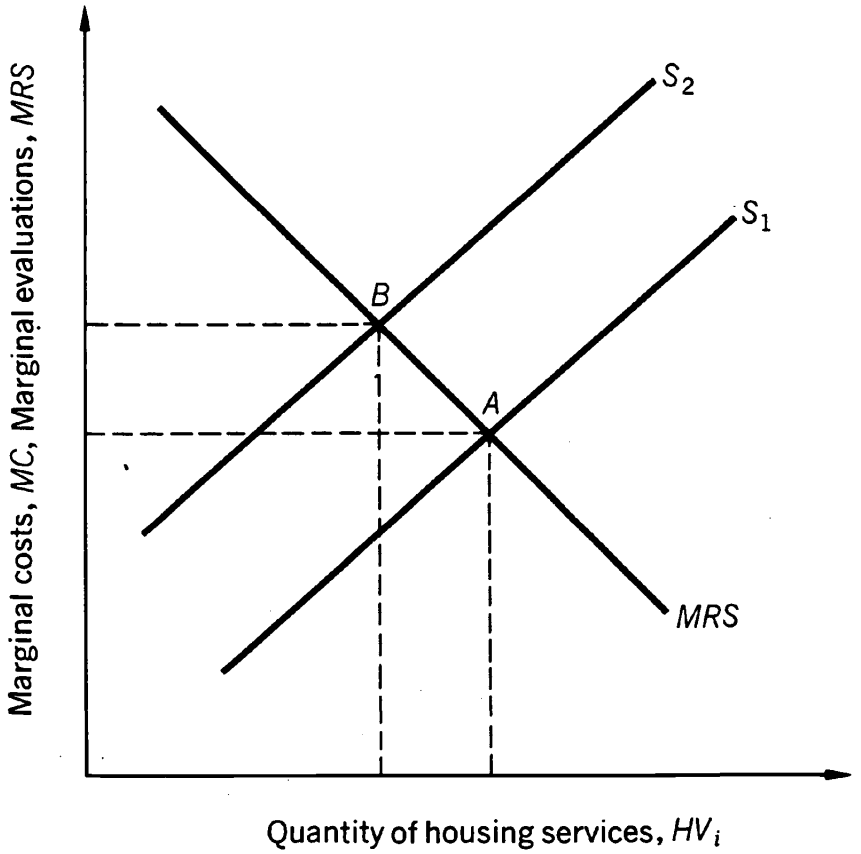



**Figure 6-5.**

The household's *distance* to the center of the SMSA is expected to have a negative relationship with rent (the further from the center the household, the lower the rent).[22]

*Type of structure*, a dummy variable with zero indicating less desirable and 1 more desirable dwelling types, is expected to have a positive relationship with rent.[23]

*Vacancies* reflect incentives for providing services as well as the total demand for dwellings. No particular hypothesis for the sign of this variable can be made.

*Property taxes* reflect the value of public expenditures, and thus should be positively related to rents.

*Average household income* for 1968-1972 is expected to have a positive relationship with rent.[24]

*Median SMSA renter income* is used to indicate the relative number of low-income tenants. No particular hypothesis is available.[25]

*Lot value*, intended to reflect the value of property in alternative uses, is expected to have a positive correlation with rent. High values for land in other uses would indicate small incentives to maintain the structure in its present form.

*Depreciation*, used to index the rate of decline in landlord revenue, is expected to be positively related to rent. When this ratio is relatively high, landlords will tend to allow their building(s) to depreciate, and rents for a given quality level will be higher.

*Renting population* reflects the scale of the housing service industry as a whole. No particular sign is predicted.

*Construction costs* designed to reflect differences in rents across cities, are expected to be positively related to rent.[26]

Average annual *heating cost* per dwelling in an SMSA is expected to be positively related to rent.

Finally, three *law* variables, indicating the status of habitability laws in an SMSA in early 1972, are introduced. They are repair and deduct, a combination of withholding and retaliatory eviction, and receivership. If enforced, they are likely to impose costs on landlords and, therefore, are expected to be positively correlated with rent.[27] Rather than introducing retaliatory eviction as a separate law variable, it has been combined with withholding laws. The withholding-retaliatory eviction variable is a dummy, with 1 indicating that both laws exist and zero indicating otherwise. Our formulation of the law variables is based on the presumption that today repair and deduct remedies are not very costly to landlords and, therefore, furnish little incentive to evict tenants. And, since unlike complaints under receivership laws, withholding laws tend to be tenant-initiated, the tenant often requires protection from retaliatory eviction.

An ordinary least squares regression was estimated, relating rent (*RTIL2*) to subsets of independent variables from Table 6-2 for 154 observations in fifty SMSAs. All variables which were not dummies or indiscrete intervals were put into logarithmic form. The results are given in Table 6-3.

All variables except LCONCOST (log of *CONCOST*) have the expected signs. The sign of *CONCOST* may indicate that fewer demolitions are carried out in places where construction costs are high. Of the housing characteristics in our equation, number of rooms per dwelling (*LROOM2*), structural type (*LSTRU2*), and average household income during 1968-1972 (*LAVGI*) were all

**Table 6-3. Rent Equation (dependent variable[a] is *LRTIL2* = log of rent plus utilities; *N* = 154; figures in parentheses are *t* ratios; an asterisk denotes significance at the 95 percent level)**

| *Independent Variables*[a] | *Coefficient* | *Independent Variables*[a] | *Coefficient* |
|---|---|---|---|
| *ROOM2* | 0.0836<br>(5.6520)* | *REDUCT* | −0.0611<br>(0.6599)* |
| *DIST2* | −0.0138<br>(0.3773) | *RECEIVE* | 0.1671<br>(2.2571)* |
| *STRU2* | 0.1502<br>(3.0004)* | *RWHOLD* | −0.0203<br>(0.1923) |
| *LAVGI* | 0.3920<br>(7.4095)* | *LPTAX* | 0.2282<br>(1.5757) |
| *LRENTY* | −0.0799<br>(0.2133) | *LHEAT* | 0.1416<br>(1.2374) |
| *LCONCOST* | −0.8035<br>(1.7348)* | *LVACPER* | −0.0682<br>(1.2368) |
| *LLOT* | 0.3032<br>(2.5345)* | *LRPOP* | −0.0562<br>(1.0442) |
| *LDEPR* | 0.1899<br>(0.6142) | | |
| Constant | 5.2068 | | |
| $R^2$ | 0.61 | | |
| *F* statistic for equation | 14.624 | | |

[a]For identification of variables, see Table 6-2. The prefix *L* denotes log form.

significant at the 99 percent level. Lot value (*LLOT*) was also significant at the 95 percent level.

Turning next to the main concern of this study, we find that of the habitability laws, only receivership (*RECEIVE*) is statistically significant. The others have negative signs, but their values are quite small and not significantly different from zero. In the presentation of the habitability laws it was pointed out that receivership laws stop the flow of rental income to the landlord completely and take away control over his building. Further, because they are initiated by government, they are backed by its rather large resources. They are, therefore, the most costly to landlords.

Altogether, the equation taken as a whole is statistically significant (the *F* value is 14.06). It has, moreover, a relatively good explanatory value, accounting for about 61 percent of the variation in rents paid in 1972 by indigents in our sample. Hence, in 1972, indigents paid

significantly higher rents in a statistical sense in states that had receivership laws than in those that did not. When the effects of all independent variables in the equation other than receivership are held constant, indigent tenants are found to have paid approximately $192 more in annual rent in 1972 in the presence of receivership than in its absence (average 1972 annual rent in our sample was $1,082).[28]

In the supply and demand estimation, heating cost and property taxes were included in the computation of $R$. For the estimation we define two new variables:

$$RHAT = .0836\ ROOM - .0138\ DIST + .150\ STRU + .228\ LPTAX + .142\ LHEAT \quad (6\text{-}11)$$

$$AVEEVAL = RTIL/RHAT \quad (6\text{-}12)$$

In the supply equation, all variables except *LCONCOST* and repair and deduct laws have the expected signs (see Table 6-4). *LHEAT* is included in the supply equation since it represents a constraint on the landlord's behavior regarding the amount of housing service he may provide. Hence, its positive sign would be expected. The depreciation coefficient indicates that as the severity of the consequences of undermaintenance diminish, so does the willingness to provide any particular level of service. High lot values predict diminished willingness to provide service, as do high vacancy rates for the low-income categories. The income for the SMSA represents a variety of factors, but can be interpreted much like *LRENTY*: higher values for income would tend to indicate that relatively more higher-quality units are available to filter down. The coefficients of the law variables indicate a reduced willingness to supply at any given price in the presence of receivership and withholding. Repair and deduct has an incorrect sign, but its coefficient is quite small.

In the demand equation, all variables have the expected signs (Table 6-4). Average evaluations tend to rise with income, and fall where property taxes or heating costs are high. The price-quantity relationship is negative, but actually horizontal for all practical purposes. The law variable coefficients do indicate that tenants place some positive evaluation on the laws, as each of these are positive.

In evaluating the costs and benefits of habitability laws, we look at the vertical shifts of the supply and demand equations that include those laws. We note that, given the formulation of the supply equation, the vertical shift resulting from the law is the horizontal

**Table 6-4. Supply and Demand Equations (sample size = 154; figures in parentheses are *t* ratios; an asterisk denotes significance at the 95 percent level)**

| *Supply Equation; Dependent Variable*[a] *= LRHAT* | | *Demand Equation; Dependent Variable*[a] *= LAVEEVAL* | |
|---|---|---|---|
| *Independent Variables*[b] | *Coefficient* | *Independent Variables*[b] | *Coefficient* |
| *LAVEEVAL* | 0.2613<br>(3.7539)* | *LRHAT* | −0.0414<br>(0.0787) |
| *LHEAT* | 0.0472<br>(0.7364) | *LAVGI* | 0.3919<br>(5.1813)* |
| *LCONCOST* | 0.0781<br>(0.3215) | *REDUCT* | 0.1045<br>(1.4761) |
| *LDEPR* | −0.2845<br>(1.6808)* | *RWHOLD* | 0.1287<br>(1.8643)* |
| *RWHOLD* | −0.0211<br>(0.3739) | *RECEIVE* | 0.1239<br>(2.1383)* |
| *RECEIVE* | −0.0497<br>(1.2627) | *LHEAT* | −0.1678<br>(1.8866)* |
| *REDUCT* | 0.0072<br>(0.1428) | *LPTAX* | −0.0265<br>(0.1849) |
| *LLOT* | −0.1947<br>(2.9435)* | | |
| *LSMSAY* | 0.9025<br>(4.9726)* | | |
| *LVACPER* | −0.0456<br>(1.6814)* | | |
| *F* statistic for equation | 7.1949 | *F* statistic for equation | 13.1363 |

[a]*LRHAT* is defined by Equation (6-11); *LAVEEVAL*, by Equation (6-12) (the prefix *L* denotes log form of the variable).

[b]The independent variables are defined in Table 6-1; *L* denotes log form.

shift times the negative reciprocal of the price coefficient. Further, we note the assumption that the shifts are parallel, an assumption that would likely be incorrect were it not for the limitation of our sample to low-income households.

For the one variable that has a significant coefficient in the rent equation, receivership (*RECEIVE*), the shift in the supply equation is larger than the shift in the demand equation. The shift in the former is about 19 percent, while in the latter it is about 12 percent. Hence, for receivership, it would appear that the costs outweigh the benefits;

however, it is important to note that these differences are not significant.[30]

It is interesting to note that receivership is the only law that seems to raise rents and has a substantial effect on the supply function. The explanation may be in the basic distinction between receivership and the other habitability laws. Receivership is undertaken by state and local governments; the others are all tenant initiated. Repairs made under receivership may be quite extensive and may be undertaken without consideration of profitability or the tenant's desires, thus imposing large costs on landlords. Repairs under the other habitability laws are tenant initiated and, therefore, would not be undertaken against the interests of the tenant. Tenant-initiated habitability laws may, therefore, represent a more effective compromise for attaining an efficient relationship between landlord and tenant.

## CONCLUSIONS

We have attempted to develop a housing market model that permits an evaluation of legal sanctions designed to assure indigent tenants habitable dwellings. Of the major habitability laws, the most powerful one (providing for receivership) was found to be associated with a statistically significant increase in rental expenditures of indigent tenants. Our data further indicate that costs may outweigh the benefits imposed on such tenants. Thus, merely extending tenants' legal rights of action, and thereby shifting some of the power away from landlords, may not in fact enhance the tenants' welfare. The cost of providing habitable housing must be borne by someone. There is evidence that the cost imposed by receivership laws appears to be largely borne by tenants without their receiving fully compensating benefits.

One striking reason why a receivership law may hurt rather than help indigent tenants is related to the failure of habitability laws to provide enhanced financial means to pay for improved dwellings. Thus, to attain their objective of aiding indigent tenants, income transfers—perhaps in the form of rent subsidies—should supplement common and state statutory laws that tilt landlord-tenant relations in favor of the latter.

## NOTES TO CHAPTER SIX

1. *Census of Housing*, 1970 Metropolitan Housing Characteristics, Final Report HC (2)-1.

2. Housing Act of 1949 § 2, 63 Stat. 413, as amended, 42 U.S. Code § 1441 (Supp. V, 1970).

3. There are some references in Martin (1971).

4. A lease at common law was considered to be the purchase of an interest in property, subject to the doctrine of caveat emptor. Since the lease agreement was considered a conveyance of property for a term, the tenant was deemed to have assumed the obligations and liabilities of ownership.

5. Key cases are *Pines* v. *Perssion*, 14 Wis. 2d. 590, 11 N.W. 2d 404, (1961); *Lemle* v. *Breeden*, 51 Haw. 426, 462 P. 2d 470 (1969); and *Javins* v. *First National Realty Corp.*, 138 U.S. App. D.C. 369, 423 F. 2d 1071, cert. denied, 400 U.S. 925, 91 S. Ct. 186, 27 L. Ed. 2d 185 (1970).

6. The landlord must be notified after the fact, and only after he has failed to take action within an appropriate time period can the tenant contract for repair. In most states, the statute permits tenants to deduct no more than one month's rent to finance repairs.

7. Repair and decuct laws can be applied relatively easily by tenants, since the laws can be invoked without a prior judicial determination. Should a judicial proceeding later determine that the tenant was not justified in taking action, he would merely be liable for the outstanding balance of the rent, i.e., the deducted repair bill.

8. As long as the violations continue, the welfare recipient is given a statutory defense to any action or summary proceeding for nonpayment of rent.

9. In utilizing a rent abatement scheme and refusing to pay rent, a tenant takes the risk that a court may later determine that his actions were unwarranted because, for example, housing code violations were not substantial enough. Should that turn out to be the case, the tenant may have to pay the rent due plus moving expenses, attorney fees, court costs, and even statutory penalties.

10. At the forefront of states legalizing rent strikes are New Jersey and New York.

11. Although initially designed to make habitability laws work by protecting tenants who complain about housing code violations, retaliatory eviction statutes can also be looked upon as devices to assure tenants of continued tenancy.

12. The interpretation of habitability laws made here is that they are different from, though not unrelated to, housing codes. Our emphasis here has been on the transfer of risk and responsibility for maintenance from the tenant to the landlord. Housing codes, however, disallow rental of low-quality units. While habitability laws may refer to housing codes as a standard of reasonableness, the housing codes typically represent very high standards, and therefore are enforced neither as a consequence of habitability laws nor by other means. Today many housing codes require, for example, that hot water be available at all taps, usually at 120 degrees Fahrenheit. Many require that every dwelling unit contain a lavatory, bath/shower, and kitchen sink. Virtually no housing code allows sharing of kitchens, and very few allow sharing of bathroom facilities between two units. Most housing codes require heating facilities capable of maintaining a temperature of 70 degrees Fahrenheit, though some do not require this between 10:00 P.M. and 6:00 A.M. The Uniform Housing Code (prepared by the International Conference of Building Officials), for example, requires that every dwelling unit have at least one room with no less than 150 square feet of floor area. Other habitable rooms except kitchens must have an area of not less

than 70 square feet; and when more than two persons occupy a room used for sleeping purposes, the required floor area must be increased at a rate of 50 square feet for each occupant in excess of two. It stipulates that habitable rooms, storage rooms, and laundry rooms shall have a ceiling height of not less than seven feet measured to the lowest projection from the ceiling. Furthermore, codes of many cities have stringent light and ventilation provisions. For example, according to the Uniform Housing Code, all guest rooms, dormitories, and habitable rooms within a dwelling unit must be provided with natural light by means of windows or skylights with an area of not less than one-tenth of the floor area of such rooms, with a minimum of ten square feet.

Many of the housing standards are perhaps so high because vested interests, e.g., the building industry, have often participated in their writing. Indigent tenants, therefore, often can find that their costs for dwellings that meet such inflated standards are very high, and in extreme cases they place a rather low value on these improvements. The courts have been cognizant of the possibility of these standards being higher than necessary. For example, in *Early Estates, Inc.* v. *Housing Board of Review*, 174 A. 2d 117 (1961), the court struck down a portion of an ordinance requiring hot water facilities as being beyond a city council's power to require facilities needed to make dwellings "fit for human habitation."

13. Ackerman (1971, p. 1103) states:

> Even if the investor originally purchased a building for $100,000 and is currently earning only one percent or $1000 per year in profit before code enforcement, the only financially relevant question for him is the value that the market places on the right to receive $1000. If a purchaser is willing to buy the future income stream for $5000, abandonment is irrational unless the anticipated stream of future code costs exceeds this amount after an appropriate discount rate is applied.

It should be pointed out that in the later parts of his article, Ackerman modifies his assumptions to allow code enforcement costs to force some dwellings to be either abandoned or converted to commercial establishments.

14. The differences in estimation procedures between the hedonic price approach and ours illustrate the contrasts between them. Rosen suggests that hedonic prices be dealt with by a two-stage estimation process. First, a simple regression of characteristics on observed prices is carried out using the best-fitting functional form. Next, the resulting characteristics equation is used to determine a marginal price of each characteristic in each of the observed commodities. Finally, these marginal price observations are used in the structural equations for the supply and demand for characteristics. All of this makes good sense in the usual setting, since the marginal price functions do determine consumers' and producers' behavior with respect to characteristics.

15. Market prices, which are constants to households, and bid rents or bid values are equal at optimal utility-maximizing levels of the household. Bid-value curves can be shown to be downward sloping, as are demand curves. Bid values are also affected by the level of income and other factors in the market. Finally, bid-value curves can be derived from indirect utility functions.

16. If there was only one set of $P$ for all cities and all individual households had differing characteristics, the envelope process, which results from optimum solutions (such as $A$) by each household, would exactly trace out the supply (marginal cost curve) of $HV_i$ values.

17. Market segmentation is one direct consequence of the bid-value approach. This is rationalized later in this paper where market segmentation is by suppliers and not by geographical subareas, which are often not segmented.

18. Many data sources, such as the Bureau of Labor Statistics and the Federal Housing Administration, record information on a "standard" or "equivalent" housing structure or household. These are often inconsistent and rarely reflect an emphasis on poor households. However, one disadvantage of the University of Michigan data is that their representativity could not be effectively calculated. Even if the 5,000 households are representative of the population in general, there are no guarantees that subpopulations in any one period are representative. In addition, several periods are examined and employed (for example, in the determination of household income). The use of time series data also could be nonrepresentative, but there is no evidence to indicate this.

Where appropriate, data from different sources were examined. In our selection process, we sought to maximize the inclusion of theoretically relevant variables without creating serious empirical problems. Of course, no definitive statement on including data from different sources can be made, since comparisons of biases resulting from omission of variables from the model and from use of proxy rather than consistent data are not possible.

19. The actual value used for rent was the total contract rent plus payment for utilities. The cost of utilities was included so that values would be comparable whether utilities were included in the contract rent or paid separately.

20. This argument would apply to any factor that had a shift in supply only.

21. As identified in Table 6-2, specification of different laws is possible. Signs of estimated coefficients and their significance depend on knowledge and enforcement which could reverse expected signs if such factors do not exist. Interpretation could also differ depending on whether the landlord or tenant initiates the proceedings.

22. Distance is an interval variable for distance from the center of the SMSA.

23. More desirable structural types are assumed to be the larger apartment buildings, where maintenance of low-cost units tends to be better than in duplexes and single-family dwellings.

24. Average household income rather than a current income measure was used because current housing expenditures are based on past decision making by the household in terms of previous as well as current income. It is also preferable to obtain some measure of *permanent* income in order to assess a relationship with a household rental expenditure.

25. Renter income levels reflect demand pressures in the particular housing market. The more segmented the housing market, the less important the pressure of other (nonpoor) households on the housing sector examined. Higher income for other renters may predict higher rents, if markets are not segmented and others bid higher, or lower rents, if more units can filter down to supply low-income tenants.

26. The construction costs variable is needed to describe differences in rents *across* cities. Such factors as variations in the costs of labor and materials are cited in the literature as important in cross-sectional models on housing. The Boeckh index includes such factors.

27. Since we do not have enforcement data, we must assume that once a law goes into effect, it provides signals to landlords and tenants, and they react rationally to the resulting incentives.

28. Since the regression line passes through the mean values of the variables, we evaluate the impact of receivership laws at this point:

Given: $\overline{RENT}$ = \$1,082 = mean value of annual rent

$RENT'$ = mean value of annual rent when a receivership law is in effect

$RENT''$ = mean value of annual rent in the absence of a receivership law

$\overline{REC}$ = 0.2662 = mean value of receivership law

$LRENT''$ = $\overline{LRENT} - 0.17\ \overline{REC}$; $RENT''$ = 1,038.

Since $LRENT' - LRENT'' = 0.17$, $RENT'$ = 1,230. The difference is \$192.

29. Given the coefficients in the supply equation and a ceteris paribus assumption, we would have for supply, $LRHAT = A + 0.261\ LAVEEVAL$, where $A$ is the intercept of the supply equation. Thus, if the presence of the habitability law changes $A$ by $\chi$ then the vertical shift is the inverse of the original supply function: $LAVEEVAL = (1/0.261\ LRHAT) - (A/0.261)$ i.e., $-\chi/0.261$. Thus, the vertical shift of the supply equation is 0.497/0.261 = 19 percent for receivership laws.

30. Withholding and repair and deduct laws indicate a slightly larger shift for demand; however, these differences are also not significant, and more important, these variables did not show significant effects on rents.

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# Comments on Chapter Six

Robert Schafer

Housing codes and enforcement procedures are typical of the regulatory approach of lawyers to social problems and have received widespread attention in the legal literature. Until recently, economists have shown little interest in integrating the law and legal institutions into economic analysis. Fortunately, the subject of law and economics is a growing area of interest to both lawyers and economists. The Hirsch and Margolis study is part of this new thrust and is particularly noteworthy as one of the few economic analyses and the first empirical study of housing code enforcement. The repair and deduct, rent withholding, and receivership laws that they study are methods that the legal profession has devised to enforce housing codes.

Housing codes and their enforcement mechanisms transfer risks from the tenant to the landlord. Property law, until recently, has enforced the principle of cavaet emptor. In fact, it has gone even further, because covenants to pay rent were found to be enforceable by the landlord even if he had violated a covenant in the same lease to maintain the premises. These rules placed the risk of nonpayment of rent on the landlord and the risk of inferior maintenance (less than promised) on the tenant. If transaction costs were zero (or even very small), this allocation of rights would have had little effect on the ultimate allocation of resources because the parties could redistribute the rights (Coase 1960). However, transaction costs are not small, particularly for the tenant. Therefore, these rules could have a large impact on the operation of the housing market. Housing codes, repair and deduct laws, rent withholding schemes, rent

receivership, and implied warranties of habitability create a new risk (renting substandard housing) and place this risk on the landlord. If a landlord persists in renting substandard housing, he (she) may have to give up income from the property for some period of time. Furthermore, these laws do not allow a redistribution of these risks, that is, the landlord cannot return the risk to the tenant via a covenant in the lease. Here we have two substantially different allocations of risks; yet we have very little to go by in deciding which is the best one or whether some intermediate allocation would be better.

Economists can contribute to the evaluation of a strategy of housing code enforcement by providing decision makers with guidance in their efforts to answer the following questions:

1. Will code enforcement lead to increased rents?
2. Will code enforcement put people out in the street?
3. What will happen if codes are selectively enforced in only part of the housing market?
4. What are the income distribution implications of code enforcement?
5. What are the welfare gains and losses?

There are, of course, several other administrative (including fairness) and political issues that must be studied in an evaluation of code enforcement. However, I discuss only the five itemized issues.

The teaching of economic theory is that when price falls below average variable cost, the firm will shut down or abandon the housing (Miller 1973). A simple set of cost and demand curves serves as an illustration. Following the work of Olsen (1969), we define an "unobservable theoretical entity," housing service per time period, which is assumed to be homogeneous. This facilitates the conceptual comparison of different dwelling units. Hirsch and Margolis make the same assumption. It is important to be aware of the limitations inherent in this approach; Olsen's framework ignores the durability of the stock, limitations on the extent to which existing units can be altered, indivisibility, neighborhood quality, the nonmarket provision of certain attributes of the housing bundle, and the spatial distribution of housing.

According to this approach, the number of units of housing services per dwelling unit per time period ($q$) increases with the quality of the dwelling unit. Let $p$ be the price per unit of housing service per time period. Then Figure 6A-1 represents the cost curves of a firm and a tenant's (or the average tenant's) demand curve for

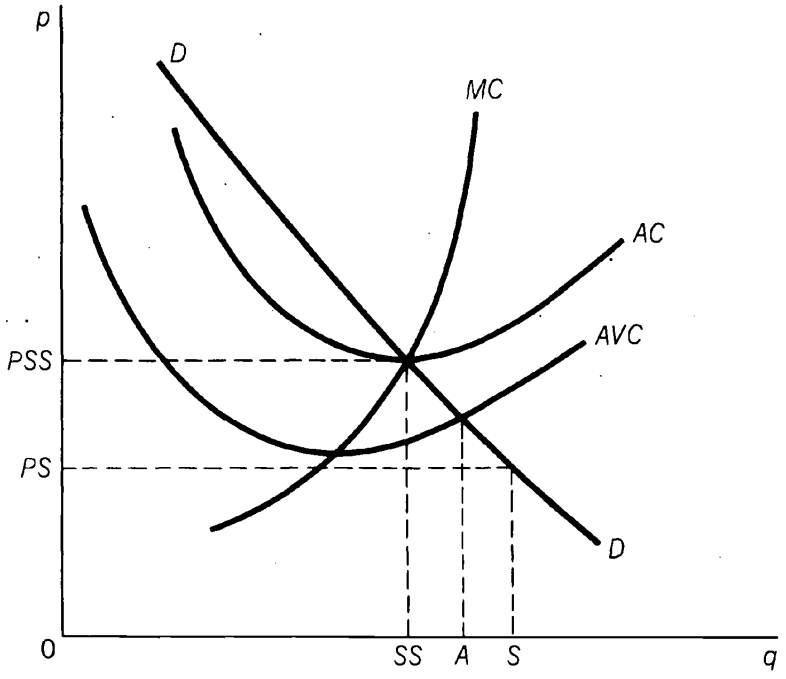


**Figure 6A-1.**

dwelling units of different quality. They are drawn so that the market would produce *SS* units of housing services per time period per dwelling unit for a price of *PSS* times *SS*. *S* indicates the minimum amount of housing services permitted by the housing code. If the code is enforced, the firm in Figure 6A-1 will abandon the building. If the minimum required by the code were to the left of *SS*, then this firm would not be affected. If it were between *SS* and *A*, the firm would continue to operate in the short run, but at a loss. As Komesar (1973) points out, the cost curves change with time (all costs become variable in the long run), and the firm may eventually close down. If the code requirement were to the right of *A*, the firm would abandon the housing and some people would end up on the street, assuming that the code includes occupancy criteria that are also enforced. We will return to this issue below.

The profitability of slum housing is a popular stereotype that is based more on mythology than fact. If slum landlords earned abnormal profits and if these abnormal profits were large enough,

there would be no abandonment. This is readily illustrated for the case of a monopolist whose marginal revenue curve is below the demand curve. The point of production would then be a $q$ less than $SS$. Then any code that required a minimum above this point but less than or equal to $SS$ could be enforced without any effect on the firm's behavior (Miller 1973).

The empirical evidence on rates of return to slum ownership is mostly indirect. Researchers examine the concentration of ownership and if the ownership is not concentrated, draw an inference of competitive returns. Sternlieb's survey (1966) of rental properties in Newark showed that 42.8 percent of the surveyed parcels were owned by persons who owned no other rental properties; 21.2 percent, by owners of one or two other rental properties; 10.9 percent, by owners of three to six parcels; and only 15.8 percent, by owners of more than twelve other parcels. Ackerman (1971) points out a difficulty with this data; the shares are in terms of parcels and not dwelling units. This is a valid criticism, but at the same time it does not justify complete dismissal of the implication that the slum housing market is competitive.

A similar conclusion was reached by Peterson et al. (1973) in a study of four Providence neighborhoods. The neighborhoods represented three different market conditions, which were defined in terms of relative market prices and price trends. In the "blighted" neighborhood they found that 80.0 percent of the properties were owned by persons who owned no other property; and only 1.5 percent, by owners of five or more properties. As is indicated in the tabulation below (Peterson 1973, p. 56), this pattern remained virtually unchanged from one neighborhood to the next:

| *Neighborhood* | *Percent Owning Only One Property* | *Percent Owning 5 or More Properties* |
|---|---|---|
| Upward transitional | 78.5 | 3.3 |
| Upward transitional | 83.2 | 1.6 |
| Downward transitional | 85.8 | 1.0 |
| Blighted | 80.0 | 1.5 |
| Total | 82.2 | 1.6 |

In this study, which covered ten cities, they concluded (p. 55) that:

> The lack of concentration of ownership in the low-income housing market in Providence clearly contradicts the image of a housing market dominated

> by several large slum lords. In other cities, the large slum lord was often talked about, and certainly individuals who owned several thousand units exist, but in each city we also found and talked to large numbers of smaller investors in blighted areas, including many black real estate operators, who specialized in buying and managing a limited number of low-income properties. While this topic deserves additional study, we conclude that there is considerable evidence that low-income areas are not the sole province of a [sic] few large investors.

Some of my own research at the National Bureau of Economic Research contradicts Ackerman's criticism that the previous studies dealt with the ownership of parcels and not dwelling units. For three neighborhoods in the city of Pittsburgh, the share of parcels held by small owners (fewer than four parcels) is just about the same as their share of dwelling units. In Table 6A-1, the data on ownership for each of these neighborhoods are summarized. Small owners owned 68.9 percent of the parcels and 63.1 percent of the dwelling units in the three neighborhoods. Large owners (more than twelve parcels) owned 11.5 percent of the parcels and 18.8 percent of the units. These data suggest that parcel ownership is a reasonable proxy for dwelling unit ownership in studying market power or concentration in the housing market.

Comparisons of rates of return on investment in real estate versus returns on other investments would throw some light on the extent of abnormal profits in housing markets. A few authors have attempted such studies with mixed success. Sternlieb (1966) found rates of return that averaged 8 to 12 percent for 32 slum properties in Newark. Sporn (1950) found a rather high average rate of return—19.8 percent—for 45 parcels in Milwaukee. These figures do not exhibit the consistently high returns that the popular belief in

**Table 6A-1. Ownership of Parcels and Dwelling Units by Owner Size and Neighborhood: Pittsburgh, 1974**

| *Size of Owner's Holdings* | *Neighborhood* | | | | | | *Combined* | |
|---|---|---|---|---|---|---|---|---|
| | *A* | | *B* | | *C* | | | |
| | *Parcels* | *Units* | *Parcels* | *Units* | *Parcels* | *Units* | *Parcels* | *Units* |
| Small | 76.9% | 67.9% | 56.3% | 57.5% | 68.4% | 62.5% | 68.9% | 63.1% |
| Medium | 11.5 | 15.1 | 37.5 | 32.5 | 15.8 | 10.7 | 19.7 | 18.1 |
| Large | 11.5 | 17.0 | 6.3 | 10.0 | 15.8 | 26.8 | 11.5 | 18.8 |
| All Sizes | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Sample size | 26 | 53 | 16 | 40 | 19 | 56 | 61 | 149 |

the slumlord suggests. Sternlieb's figures for Newark are comparable to returns on corporate bonds. In addition, in none of these studies have the risk differentials been systematically assessed in relation to the rates of return.

There is no reason to believe that the minimum housing services required by the code will be related to the firm's cost curves in any specific way. At a minimum, we would expect some distribution of the firm's cost curves about the code requirement. In addition, the empirical evidence is inconsistent with very sizable abnormal profits. As a result, some firms would be expected to abandon dwelling units. Then, one of the important empirical questions is: How many dwelling units might be abandoned under code enforcement?

Abandonment could also be avoided if tenants were willing to pay the price demanded by landlords for providing code-standard housing. As was shown in Figure 6A-1, for the low-income housing market, the interaction of supply and demand for housing services per dwelling unit ($q$) results in a housing quality that is below code standards ($SS$). If a code is enforced at $S$, the supply price per unit of $q$ will increase or remain the same depending on the price elasticity of the supply of $q$. However, the supply price of the dwelling unit ($p \times q$) will always increase, even with a perfectly elastic supply of $q$, because $q$ is being forced up. Households will have to choose between paying this increase and living on the street. This choice is dipicted in Figure 6A-2 in terms of a budget transformation line ($TB$) and indifference curves ($I$ and $I'$). Most of the budget line is curved because the supply price per unit of $q$ may change with the amount of $q$. If a housing code is enforced at a minimum amount of $q$ equal to $S$, the household has two choices: pay the higher price and consume $S$ or move to the street. The budget transformation line has been drawn with a vertical portion (line segment $AB$) that represents no cash expenditures for housing; this segment amounts to living on the street. If the indifference curve that passes through the point on the budget transformation line at $S$ does not also intersect $AB$, then the household will choose to pay the higher price of a dwelling unit with $S$ units of housing service per time period. If the indifference curve intersects $AB$, the household will choose the street. If the code's minimum $q$ is above $T$, the household will be forced to the street because its income would be insufficient to pay for this much housing. The demand curve that is implied by the choices under code enforcement has a kink at $q$ equal to $S$. For $q$'s that are greater than $S$, the demand curve is unchanged. The demand curve below $S$, however, disappears and is replaced by a vertical line rising from the point on the original demand curve that corresponds with $S$. As a

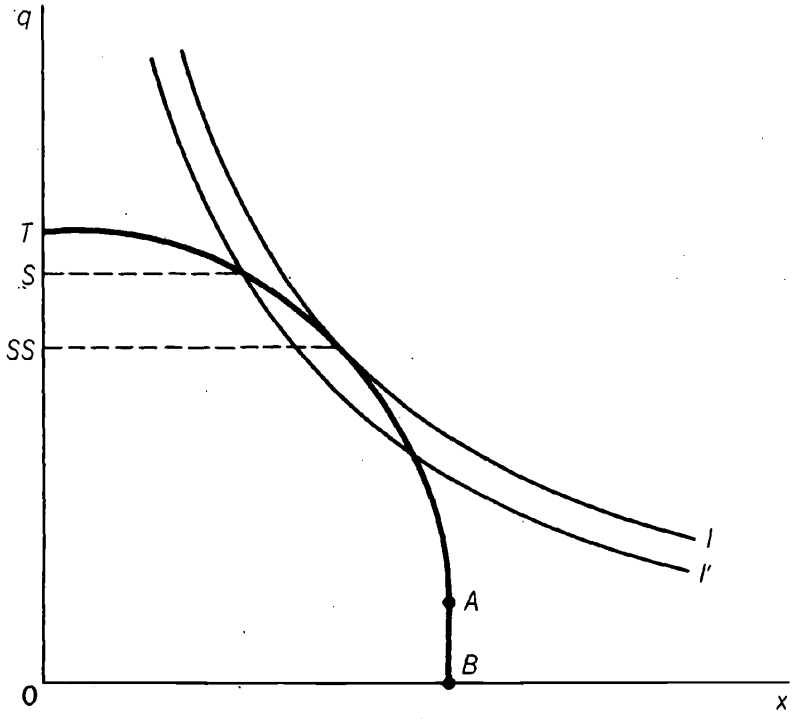


**Figure 6A-2.**

result, price elasticities of demand in the low-income submarket should be less elastic in the presence of code enforcement.

In the preceding analysis, it has been assumed that the code, which includes occupancy standards, is enforced throughout the housing market. If that is not the case, then households will have a third option—moving to an area where the code is not enforced. They would undoubtedly elect this option whenever it is available because it would maximize their satisfaction, i.e., restore them to a tangency position. Under a fully enforced housing code the household would be obliged to sacrifice some satisfaction. This is a deadweight welfare loss to society unless the other members of the society reap substantial gains in their utility because no one lives in substandard housing (Daly and Giertz 1972, Aaron and von Furstenberg 1971).

In practice, it is likely that the parts of the housing code covering facilities and the level of maintenance will be enforced while the occupancy restrictions, e.g., persons per room, will be relaxed. If that happens, tenants will have the option of doubling up in dwelling units that meet code standards except for the occupancy restrictions. This alternative will undoubtedly appeal to many tenants. As in the case of enforcement in only part of the geographical area comprising the submarket, partial enforcement of the code provisions will lead tenants to take advantage of the loophole to move toward their higher levels of precode satisfaction.

In view of the preceding discussion and review of empirical evidence, economists would be inclined to answer the five questions posed earlier as follows: Rents will probably increase, but the amount of the increase will depend on the price elasticity of the supply of housing services per dwelling unit. Although the supply will probably decline, the result will depend on the extent of abnormal profits and the choice of households between accepting code housing or living on the streets. If codes are selectively enforced in only some geographical parts of the market, code enforcement will probably have little effect on households other than generating a move to a new area, and might result in the abandonment of some physical capital in the area of enforcement (Ingram and Kain 1973). The tenants will bear the burden of rent increases above any abnormal profits. Any income redistribution will be from landlords to tenants, but only to the extent of abnormal profits. After the abnormal profits are absorbed, the tenants will suffer a deadweight welfare loss. There are better ways of achieving income redistribution objectives (Komesar 1973, Posner 1972). If, however, Congress decides to enact and fund a housing allowance program, tenants would have the income to pay the increased cost associated with code enforcement, i.e., a national housing allowance would make an effective code enforcement program possible.

Ackerman (1971) has presented an argument that under certain circumstances, which he seems to believe are highly probable, rents will not increase, supply will not decline, and housing code enforcement will be a better income redistribution device than a negative income tax. Although he carefully discusses his assumptions, the limits of his conclusions are often lost in the midst of a lengthy brief on behalf of his general conclusion. A comment by Komesar (1973) undermines much of Ackerman's analysis, especially on the issue of the preferred measures of income redistribution. However, Komesar's attachment to the long-run supply curve is as unrealistic as Ackerman's assumptions. Studies of the housing market suggest that the

price elasticity of supply is more inelastic than elastic. At the same time, it is not inelastic enough to justify Ackerman's assumptions, which amount to an extremely inelastic supply curve. Muth's analysis (1960) indicates that the housing market as a whole requires six years to absorb 90 percent of a shift in demand. De Leeuw and Ekanem (1971) have estimated the price elasticity of the supply of housing services per dwelling unit to be 0.3 to 0.7. There is nothing paradoxical or surprising about Ackerman's conclusion, because it follows directly from his assumptions. In essence he assumes that there are abnormal profits in Slumville and that, for nearly all firms, price is greater than average variable cost at the point on the firm's cost curves that corresponds to code-standard housing. Whether Ackerman's scenario is correct is an empirical question. What are the profit levels in the low-income housing market? What are the price elasticities of supply and demand?

Hirsch and Margolis present an elegant theoretical discussion, but it does not add to the reader's understanding of the specification of the estimated equations. Their central purpose is to analyze whether the reallocation (and creation) of risks due to habitability laws shifts the supply and demand curves. The potential contribution of the study lies in its empirical analyses.

The theoretical discussion adds confusion rather than clarity, since it is a questionable modification of Rosen's analysis (1974) of hedonic price indexes. The difference between the two formulations arises from the addition of supply (e.g., the construction cost index), demand (e.g., household income and median income for renters in the SMSA), and legal variables to the housing characteristics normally found in an hedonic price index. Hirsch and Margolis justify this on grounds that their observations are distributed across many different cities, each of which may be facing very different supply and demand equations. This justification seems to be relevant for the SMSA-level variables but not for each household's income (average over 1968-1972).

The coefficients of the housing characteristics (number of rooms, distance to the central business district, structural type, property tax, and heating cost) are employed as the implicit prices of these attributes to calculate a measure of the amount of housing services in each dwelling unit ($\hat{R}$). The latter is then used as the quantity variable in the supply and demand equations. The five housing characteristics are an inadequate description of the attributes normally associated with housing. There are no characteristics that capture neighborhood attributes or level of public services or building attributes—lot size, floor area, kitchen facilities, heating systems, and

bathrooms, to name but a few. Property taxes per household for the SMSA is a wholly inadequate representation of the amount of public services associated with any particular dwelling unit, since services vary widely between governments and even within jurisdictions. There is also no measure of the quality dimension, even though the Michigan Survey contains information on the repair needs of each dwelling unit. That measure, although inadequate in terms of the heterogeneous nature of housing, would have been better than none. The interpretation of structural type as a cost-related variable instead of a housing attribute such as density indicates an inadequate understanding of the hedonic technique. The limited characterization of the housing bundle makes the use of these coefficients to construct a quantity measure for housing highly questionable. Such use is further questionable on conceptual grounds because the inclusion of the so-called supply and demand variables obfuscates the meaning of the housing characteristic coefficients (Rosen 1974). It may be the case that the operation of housing markets in different SMSAs can only be effectively examined by estimating a separate hedonic price index for each SMSA. The estimate could be made from micro data, using the Public Use Sample from the 1970 Census. Although the Michigan Survey is more recent, a check of the states that have receivership laws shows that all of these laws were in force prior to the 1970 Census. The laws were enacted in 1962 (two states), 1965, 1966, 1968, and 1969. Therefore, the Michigan Survey does not have a major advantage over the Census for the most important legal variable. A sample of 154 observations is too small to study what amounts to fifty different housing markets.

The legal variables consist of three dummies, one each for states that have repair and deduct laws, rent-withholding and retaliatory eviction laws, and rent receivership laws. Receivership laws are believed to be the most effective enforcement measure of the three, and rent-withholding laws are believed to be more effective than repair and deduct laws. Only six of the twenty-five states in the sample have rent receivership laws: Illinois, Massachusetts, Michigan, Missouri, New Jersey, and New York. It is quite possible that these dummy variables could represent other factors, such as urbanization or a propensity to pass progressive social legislation, that those states have in common. With these reservations in mind, Hirsch and Margolis estimate that tenants pay significantly higher rents in states that have rent receivership laws. The other two legal variables have negative signs and are not statistically significant at the 5 percent level. Although Hirsch and Margolis describe their rent equation as being in reduced form, it is not clear what it is a reduced form of. It

certainly is not a reduced form of the supply and demand equations. As a result, the meaning of these estimates and their bearing on an evaluation of housing code enforcement remains unclear.

One would hope that the supply and demand equations would provide more useful information. However, they are beset with specification problems, and perform unsatisfactorily. The proxy for quantity is the hedonic value ($\hat{R}$) and that for price is the ratio of the actual rent to the hedonic value ($R/\hat{R}$). As in the case of the hedonic equation, the supply and demand equations differ in substantial respects from those recommended by Rosen (1974).

The supply and demand equations are asserted to be well-defined structural equations. If we accept the Hirsch and Margolis proxies for quantity and price, we would expect two structural equations that had quantity as the dependent variable, namely, $\hat{R} = f(R/\hat{R}, HDF, L)$ for demand and $\hat{R} = k(R/\hat{R}, HSF, L)$ for supply. Instead, Hirsch and Margolis switch $\hat{R}$ with $R/\hat{R}$ only in the demand equation. They are not the first to do this; others have entertained similar specifications with no more explanation than that "it is convenient" (de Leeuw and Ekanem 1971). It may be convenient, but why should this be the specification? It will affect the empirical estimates because in one case the sum of the squared errors of quantity ($\hat{R}$) is minimized, and in the other, that of price ($R/\hat{R}$). These procedures will give different estimates of the price elasticity of demand. In the Hirsch-Margolis formulation this price elasticity is the inverse of the coefficient of $\hat{R}$, and the coefficients of *HDF* and *L* variables would have to be transformed (multiplied by the negative of the price elasticity) to arrive at estimates of their effects on demand. A further estimation problem arises because $\hat{R}$ appears in the dependent variable and one of the independent variables in both equations.

In appropriately specified supply and demand equations, the legal variables contribute to an evaluation of housing code enforcement by providing information on the allocation of risks between landlords and tenants. If code enforcement shifted risks from tenants to landlords, the supply curve would be expected to shift to the left (negative coefficients for the legal variables in the supply equation), and the demand curve would be expected to shift to the right (positive coefficients for the legal variables in the demand equation). The shift in the supply curve would probably not be parallel; the curve would shift further at lower values of $\hat{R}$ than at higher ones because code enforcement will have less effect on the risks of supplying housing above the code standard. The Hirsch-Margolis estimates indicate that the supply curve shifts as expected in response to rent receivership and rent-withholding laws but shifts in

the opposite direction for repair and deduct laws. The legal coefficients in the Hirsch-Margolis "demand" equation must be multiplied by the negative of the inverse of the coefficient of $R$ to obtain the coefficients corresponding to the standard demand and supply equations. As a result, the legal variables would have the expected signs and would represent the expected shifts. All the coefficients of the legal variables in the supply equations are highly insignificant by conventional statistical tests, and the repair and deduct variable is insignificant in the demand equation.

The estimate of the price elasticity of supply (0.2613) compares reasonably well with prior estimates. At the same time, I am hard pressed to explain the role of *LSMSAY* (average income for the SMSA) in a supply equation. This demand variable appears to be in the wrong place; yet it plays a prominent role in the estimated equation. Such an income variable would be appropriate in the demand equation, but there is none there. (A measure of each household's income, however, is appropriately included.)

The demand equation is beset by a similar problem of suitability: *LHEAT* (average annual heat cost per structure) is a prominent, but inappropriate, variable in that equation. *LHEAT* could be interpreted as a proxy for climatic variations in demand, but temperature would be better suited for the purpose. As a supply variable, *LHEAT* could represent an input cost differential or some regionally varying constraint on the production function. In the former role, we would expect a negative sign. The estimate, however, is positive, and Hirsch and Margolis explain that *LHEAT* is a constraint on the amount of service a landlord can provide.

These empirical and conceptual inadequacies in the estimated equations and the statistically weak and inconsistent results for the legal variables cast considerable doubt on the reliability of the estimates. I certainly do not have a great deal of confidence in the comparison of costs and benefits. In fact, the comparison is troubling because it is inappropriately framed in terms of a cost-benefit analysis at the same time that such important elements as administrative costs are ignored. The shifts are interesting, but they do not contain enough information to evaluate housing code enforcement.

In summary, the important empirical questions remain without any clear-cut answers. The most that can be said is that the Hirsch-Margolis results are inconsistent with Ackerman's world because the supply curve shifts more than the demand curve for rent receivership, which is the most effective enforcement procedure of the three under study. Rent increases and welfare losses are likely to accompany code enforcement.

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