AN EVALUATION OF

THE RENT CONTROL POLICY OF

CAMBRIDGE, MASSACHUSETTS

by

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ABSTRACT

The rent control policy of Cambridge, Massachusetts is examined here in
terms of its social function and its economic impact. The social goals
that are to be served by the policy are the protection of the poor and the
elderly and the prevention of disruption to the established neighborhoods
of the city. The economic impact is studied in terms of the possible
income loss that the policy imposes upon landlords and the income benefit
that is given to tenants.

The design of the legislation assumes that there is a relationship between
the target populations that the policy hopes to serve and the type of
building brought under rent control and the type of building exempted. It
was found that this assumption breaks down in the highly mixed Cambridge
market. Rent control, in terms of the tenants that it selects to protect,
appears to be indifferent to household income and rent as a percentage of
income. The policy tends to serve the non-elderly rather than the elderly
and tends to serve short-term rather than long-term residents. It tends
to protect households with unrelated members especially single individuals.
The controlled units are concentrated in the areas around Harvard Univer-
sity where the tenants tend to be students, professionals and members of
unrelated households.

The legislation further assumes that the Rent Control Board will adjust
rents so as to provide landlords with a fair net operating income. It has
been found that rents have been adjusted upward about 3% annually while
expenses have followed an 8% annual inflation rate. This means that a
fair net operating income has not been provided to controlled property
either in terms of discounted value or in terms of absolute number of
dollars remaining after expenses are paid. The tenants in controlled
property have not altered their housing utilization in terms of persons
per room giving some indication that the income benefits that they re-
ceive from rent control are not used to improve housing consumption but
are used for non-housing consumption.

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INTRODUCTION

Rent control has been the subject of a good deal of debate with several

arguments mounted on both sides. The arguments for rent control basically

fall into three areas. First, the nature of the housing market is such

that the demand for housing can change dramatically in a short period of

time while the supply of housing may be slow in responding to changes in

demand. Rent control can be used to bridge the gap between the change in

demand and the response by the supply. Second, housing is a good for which

there is no substitute; all households must consume some housing. Rent

control may protect households from the undue burden that can occur in an

inflationary market for which there is no alternative. Third, rent control

attempts to serve a social function by protecting the poor and the elderly

who are the most likely to be injured in an inflationary housing market.[1]

The arguments against rent control center upon its market impact. First,

rent control, it is argued, forces landlords to reduce maintenance expendi-

tures thereby reducing the quality of housing. A policy that causes

deterioration of the housing stock should be used sparingly if at all.

Second, rent control may unfairly single out one sector of the market for

taxation, the rent controlled property. This tax may then be transferred

into income benefits for tenants at the landlords' expense.[2]

The two key issues involved in this debate are the social benefits of the

policy and the economic repercussions of the policy. This research will

attempt to examine rent control in light of these two issues. The rent control policy of Cambridge will be used as a case study. Under the area of social benefits the issue will be the identification of the beneficiaries of the policy. Does the rent control policy deliver its benefits to the target populations? Under the area of economic impact the issue will be an estimation of the costs of this policy to the property owners. What income loss is suffered by landlords as a function of this policy?

Rent control made its most recent appearance in Massachusetts with the adoption of Chapter 842 of the Massachusetts General Laws. This enabling act empowered cities with a population of at least 50,000 to enact a rent control policy that would establish maximum rents for certain types of rental housing. The Act declared that a housing emergency exists in the rental markets of Massachusetts as there is a lack of sufficient housing for families of low- and moderate-income and rents in these markets are abnormally high.[3]

The Act goes on to define the specific types of rental structures which can be regulated under the powers granted. Basically, this covers all rental housing except that built after 1969, owner occupied two and three family buildings and buildings operated by public housing authorities. The rents of all other rental housing would be subject to the regulation of the rent control administration of the city. The administration could take the form of either a board of volunteers or of a single administrator. This administration is charged with setting rents and making adjustments to those rents in order to provide a "fair net operating income" for landlords. Factors to be considered in determining the need for adjustments

are listed in the Act as the changes in operating expenses of rental property, capital improvements made by the landlords, changes in the size or quality of the rental units and whether or not the property meets minimum building and housing code standards.

The city of Cambridge adopted the rent control policy as defined in Chapter 842 in September of 1970. This Act has since expired, but the power to continue rent control was extended through legislation enacted on Cambridge's behalf. The rent control powers are the same in this new legislation as those granted in the original Chapter 842 version. Upon adoption of the rent control policy the City ordered landlords to register their units. An administrator was appointed who immediately ordered a rollback of rents and, with that order, the problems began.

Litigation challenging rent control was initiated almost immediately but was struck down by the courts thus validating the power of the city to control rents. Landlords objected to the rent rollback and threatened not to pay property taxes. Tenants protested the level of rents and threatened to begin a rent strike.[4] Much of the controversy centered around the formula for adjusting rents with increases in expenses. The administrator devised a formula linking rents to a percentage return on the landlords' investment which was itself set according to the value of the property. This value was, among other methods, to be determined by the income earning capacity of the property. Perhaps as a reaction to this circular reasoning, the City Council passed an order stating that any increases granted to allowed rents should be in the exact amounts of the cost increases and no

more. Hearings were held, more court action was initiated and the adminis-
trator was replaced. The City Council further ordered that a Rent Control
Board be appointed to replace the current form of administration. This
order was not implemented. Apparently disgruntled by the course of events
the 1970-72 Council, just before its term of office ended, passed an order
repealing rent control in December of 1971. About one month later, the
new incoming City Council reinstated the rent control policy and imple-
mented the board form of administration.

The new Rent Control Board immediately confirmed the rent rollback initiated
by the previous administration but was enjoined from carrying out that
policy by the Courts. The litigation was later resolved in favor of rent
control, but the delay provided the time for the Board to resolve a new set
of policies on what level of rents should be allowed. Research on the
behavior of rents indicated that rents had been fairly stable up until 1967.
At that time they began to rise rapidly.[5] This rise, it was assumed, was
a function of increased demand for housing creating the housing emergency.
For this reason the Board adopted 1967 as a base year of reference during
which rents and expenses were at a fair market level. They then allowed
a 30% increase in rents due to cost increases since 1967. This adjustment
became effective in November of 1972, at which time the landlords had to
reregister their units and report the rents received in 1967 as well as
the expenses incurred in that year. This new approach of granting an adjust-
ment from a base equilibrium year was believed to be the best approach to
providing a fair net operating income to landlords.[6] The Board has granted
a series of adjustments since that time in both a general form, granted to

all buildings not receiving special increases, and individual adjustments, granted to landlords who petitioned the Board for a hearing and were able to demonstrate a particular hardship thereby justifying special treatment. The administration of the rent control program has followed this basic approach to the present.

Rent control has persisted in Cambridge under the powers granted by the statute for some time. These powers, once the initial organizational and policy defining problems were surmounted, seem to be adequate to the task of regulating rents. However, the Act does not assess the ongoing status of the housing emergency. It does not check to see if the actual benefi- ciaries of the program are, in fact, the intended beneficiaries. It makes no attempt to assess the market impact of the policy.

In an effort to provide an evaluation of the policy, this research is organized into two parts, the identification of the beneficiaries of the policy and the assessment of its market impact. The research questions that will be addressed under the beneficiaries topic are:

    Who are the intended beneficiaries of the rent control policy?

    Who are the actual beneficiaries of the policy?

    How do the two groups compare?

The research questions that will be addressed under the market impact section are:

What income loss have landlords suffered as a result of the policy?

How are these benefits used by the tenants; do they use them for housing or non-housing consumption?

OPERATING ASSUMPTIONS REGARDING RENT CONTROL

An evaluation of Cambridge's rent control policy requires an enumeration
of the theories that influenced the design of the legislation. These
theories identify the populations that the policy is intended to serve,
the assumptions linking the target populations to the rental market that
is controlled and the operating principles intended to guide the adminis-
tration of the policy.

Section 1 of the enabling legislation declares that a housing emergency
exists in Cambridge and defines the emergency as the shortage of rental
housing and the existence of excess demand due to the attraction of tenants
to the city.[7] The results of this emergency are inflated rents and the
displacement of long-term residents by the new, incoming tenants. This
impact is especially hard, the bill states, on the low- and moderate-income
tenants and the elderly on fixed incomes. Therefore, these tenants are
among the policy's target population. The policy goes on to state that
unless the rents in the market are regulated, the health, safety and welfare
of the residents will be threatened.

The emergency declaration has become one of the major issues in the debate
over rent control. The opponents argue that rent control can be justified
only if an ongoing emergency, defined as demand in excess of supply, exists.
They contend that if the rental housing market has loosened, as would be
evidenced by a higher vacancy rate, then the policy should be discontinued
as the emergency has subsided. The proponents of rent control argue that

the emergency has more features than just the presence of increased demand.
The combined effects of inflation, speculators in rental property and
increased numbers of student households have created an emergency that
cannot be gauged by the vacancy rate alone.[8] Without attempting to deter-
mine the precise definition of a housing emergency envisioned by the
legislature when it adopted the rent control act, it seems appropriate to
an evaluation of the rent control policy to read the definition of emer-
gency in the broad sense. First, it seems well established that the
vacancy rate has increased somewhat since the policy was enacted.[9] This
fact alone would be sufficient to some to justify the repeal of rent
control. However, a higher vacancy rate says little about the many other
arguments both for and against rent control. Thus, a second reason to
explore further is that failure to do so would be to overlook the possible
merits of those arguments and to ignore many of the complexities working
in the Cambridge rental housing market.

For these reasons, the objectives of the policy will be defined as those
that the act explicitly mentions as well as other goals. Though not
explicitly stated in the legislation, these additional objectives may be
inferred as the purposes meant to be served by the rent control policy of
Cambridge.[10] First, the policy hopes to protect the established neighbor-
hoods of the city. Presumably, the increased demand that has brought about
the housing emergency is due, not to household formation from within the
city, but to new households moving into the city from outside. In many
cases these new, incoming households are willing and able to pay higher
rents than are households made up of long-term residents. Even if they

do not possess greater incomes, the new households are often willing to live in crowded quarters in order to find an apartment in the city. As the supply of dwelling units is fixed in the short run, owners of rental property can take advantage of the excess demand by raising the rents and allowing the pricing mechanisms to ration the scarce resource, the available stock of apartments. This means that households willing to pay the inflated rents will consume the units and those unwilling or unable to pay will be displaced to either lower quality housing within the market or will be forced out of the city altogether. In Cambridge this may have the effect of allowing new households to displace the long-term residents of the city and cause disruption of the established neighborhoods.

Rent control provides the means to inhibit demand-inflated rents by placing a ceiling on the rents that landlords may charge for their units. The rents are fixed at some level considered to be a fair market rate. Thus, instead of a price rationing system to reallocate the housing among the tenants, those tenants residing in the city before the influx of new households will be allowed to stay and pay the same rents they have paid under the market equilibrium condition. The incoming households will be compelled to wait for rental units as they become available either through natural turnover or through the construction of new units. This, it is theorized, eliminates the disruption of the established neighborhoods while still granting a fair market return to landlords.

A second major consideration underlying the rent control legislation is the protection of a tenantry that is effectively trapped in the market. Housing

is something for which there is no complete substitute in terms of market

consumption. Each household must find some form of shelter. The only form

of substitution that is available to the household is the quality level of

housing that they choose to consume. If rents go up, as would be the case

in a market experiencing rapidly increasing demand, then the residents of

the housing are faced with paying either higher rents or moving out of the

unit that they now consume. Moving costs are high and must be faced even

with a downward movement to a lower quality and presumably lower cost

dwelling unit. Paying the higher rents or suffering the costs of moving

is especially difficult for the poor. This sort of added expense seems

unfair when in an inflated market the dwelling unit itself has not changed

in terms of condition but its value to the consumer has changed given the

increased demand. This is to say, other households are willing to pay a

higher price for the same unit. To avoid having sitting tenants pay an

increased percentage of their income for housing that has not changed in

terms of condition, the rent control policy acts as a way to prevent hard-

ship on the "trapped" tenantry. Rent control, by freezing the rents at

some fair market rate, maintains this equilibrium condition.

A third issue that helps to justify the existence of rent control is the

quickness with which demand increases and the slowness of the supply in

reacting to the increased demand. An increase in the demand for rental

units can occur in Cambridge very easily. All that is necessary to put

a strain on the housing supply of the city is an increase in the enrollment

in the universities in the area. This increased increment of demand

virtually all arrives in the market in September of each year. Unfortunately

the supply of dwelling units in Cambridge is, as with all other housing markets, subject to delays in reacting to the new demand. There are lags in the time it takes for investors to recognize the increased demand. Additional delays occur as developments are planned and constructed. Rent control is, then, a stopgap measure to bridge the time lapse between experiencing the strains of increased demand and, either the market's response to the increased demand through additions to the supply or, a decrease in the demand itself. Rent control prevents the market from achieving a higher short run equilibrium price for housing until the new supply returns the market to an acceptable level of long run equilibrium.

The fourth fundamental objective of rent control is the elimination of conditions that permit speculators to gain profits over and above what they could charge in an equilibrium market condition. During a period of excess demand some landlords may be tempted to obtain higher profits generated by the new and higher values given to existing dwellings due to the increased demand. Presumably these landlords share no concern for the displacement of tenants that have been long-term residents of the neighborhoods affected. To inhibit this type of operation rent control prevents, not a fair market profit, but a profit derived from the demand-inflated rents that can be charged during the housing emergency. It is important at this point to emphasize the "ceiling rent" objective of rent control. The rents that are permitted by rent control are not specifically designed to be below what a fair market condition would allow. They are, instead, to be at, but no higher than, the fair market rate. Thus, rent control is, in a sense, not designed to force lower rents as some mistakenly allege but is intended

only to place a ceiling on rents such that excessive profits are not allowed
due to increased demand.

If the rent control legislation is expected to respond to these considera-
tions then there must be some connection between the goals stated and the
particular design of the policy itself. First and foremost, the rent control
policy that is in effect in Cambridge places some, though not all, rental
units under the regulation of the Rent Control Board. The policy has no
method to link its operation to the tenants or the landlords themselves
other than through the decisions as to which units are to be controlled
and which are to be exempt. The conditions that must be met for the unit
to be exempt from rent control are, first, the building must have been built
after 1969 or, second, the building must be an owner-occupied two or three
family structure. All other rental units are to be under rent control.
The rent is fixed as a certain percentage over what the rent was in 1967,
deemed to be an equilibrium year in the market by the Rent Control Board.
Increases have been granted to all units from time to time; these general
adjustments are intended to cover the increased costs that have accrued to
the owners of rental property but no additional profit beyond that base
year level.[11] Some individual adjustments have been granted to landlords
that have applied for the adjustment and have been able to prove cause for
the increase.

Such a policy design assumes that there is some relationship between the
units that it draws into its control and the population that it intends to
serve. In addition, it can be concluded that the policy must be designed

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to cover those landlords whose activity is considered unfair. Finally, as the impact of the policy is not universal but selective, there must be some assumed relationship between the location and nature of the excess demand and the areas of the rental housing market brought under rent control.

The rent control policy is tied to the units and not to the tenants themselves. The Rent Control Board maintains vast files on the units under its control but knows nothing of the tenants that reside in the controlled units. If the policy is functioning as intended, the poor and the elderly are the tenants. This is an empirical question that can be resolved. The exemption of new housing must assume that these subpopulations do not live in this category of housing. This is not an unreasonable assumption as the new housing can be expected to command high prices and to be outside the older established neighborhoods that the policy seeks to protect. The exemption of the two and three family owner-occupied houses must also assume that this type of housing is not subject to the pressures or, at minimum, does not succumb to the pressures of the inflated market. This may be true if the location of this type of housing is such that it is not in the path of the increased demand.

The policy being tied to the units means that it directly affects the revenues of the landlords. The exemption of new units must imply that speculators do not operate in the new and higher price markets. The design of the policy assumes that this portion of the rental market is working well. The exemption of smaller owner-occupied dwellings may be justified in that landlords who own this type of property do not respond to the

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opportunity to increase rents to what the market will allow. Especially where the landlords are themselves residents of the neighborhoods, this line of thought may be valid. In any event with new and large housing, if speculators do raise rents it will be those best able to afford the cost of increased rents or the costs of moving who will be affected. If speculators operate primarily in older, larger housing, then the design of the policy may be correct.

A further operating assumption that may be inferred from the design of the policy is that the exemption of new units from rent control may have been an effort to avoid discouraging new construction from entering the Cambridge market. Obviously to alleviate the problem of increased demand in the long run, new housing units will be needed in the market. If new investors see their future earnings as being subject to the limits imposed not by the market but by the Board, then they may be reluctant to enter. It is assumed that exemption from rent control will alleviate this fear.

Finally, the provision for rent increases both across the board and granted individually is a recognition by the authors of the legislation that rent control cannot freeze the rents at some level without some allowance for cost increases. The purpose of the adjustments is to allow a fair net operating income to the property owners. The definition of what constitutes a fair net operating income is left, effectively, to the Board itself. The goal is clear however. Rent control is to allow the pass-through of the increased expenses suffered by the landlords but no more.

To summarize, the rent control policy is designed with a number of assumptions linking the market to the intended population. These assumptions are the crux of the issue of the social function of rent control. Rent control assumes that a link exists between the types of buildings brought under control and the target population that the policy intends to serve. It further assumes that the areas that it intends to protect, the established neighborhoods, are those areas where the controlled buildings are located. These assumed linkages can be tested by the identification of the actual beneficiaries of the policy and the geographical distribution of the controlled market.

ECONOMIC THEORIES ON RENT CONTROL

The operating assumptions that led to the design of the legislation defined the issue with regard to the social function of the policy. The economic function of the policy cannot be determined from an examination of the legislation itself. In order to define the issues involved in rent control's market impact it is necessary to examine the economic theories that have been developed with regard to rent control in general. Then, given the theories, it will be possible to examine the specific application of these theories to the rental housing market in Cambridge.

The areas of study covered in various economic theories regarding the impact of rent control are first, the consumers' position, the expenditure by tenants and the benefits derived, and second, the property owners' position, the income loss and the adjustments in operating expenses made due to rent control. To examine these two major areas some assumptions are necessary.

First, it will be assumed that the market is at equilibrium at the time rent control is imposed. This is not an unreasonable assumption for the Cambridge rent control process. The Rent Control Board recognized that, upon imposition of rent control, the market was not in equilibrium. To correct this situation the Board decided to adopt 1967 as a base year and to roll rents back to that year as it was, in the Board's view, a year of market equilibrium. Cost increases have been allowed on top of that base year, but the purpose was to allow for increases that cover these costs with no increased return on investment for landlords. Thus, given the

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Board's initial effort to fix rents to some base equilibrium time period,
it can be assumed that the market was in equilibrium at the time rent
control began its operation in Cambridge.

Second, each apartment is viewed as a good capable of providing a range
of different outputs. These outputs reflect the ability of housing units
to vary in quality. Any given unit may, with upgrading or downgrading,
provide a different amount of service measured in units of housing service.
A unit of housing service is a theoretical entity equating the quality of
a dwelling unit with its output. Higher quality dwellings are considered
to have higher outputs, that is, to produce a larger number of units of
housing service. For the purposes of pricing theory a dwelling unit is
considered to be a package of units of housing service.[12] With investment
in capital improvements the units will increase in quality and, therefore,
the output will increase. With no investment in maintenance the output
will decrease as the dwelling deteriorates over time. This is an important
issue in the debate over the impact of rent control. It has been argued
that if rent control is imposed such that rents are held below what the
landlords could realize in an uncontrolled market, then landlords may
attempt to reduce output.[13] Consumers, on the other hand, will attempt
to gain the benefits of the reduced rents from rent control through excess
consumption. In Figure One this is represented by a controlled market
with rents reduced from R_0 to R_1. In this situation the owners will attempt
to reduce the output from Q_0 to Q_1 and consumers will attempt to obtain Q_2
rather than Q_0 amounts of housing.

RENT

R_0 ..... A ..... B

R_1 ..... D C

SUPPLY

DEMAND

Q_1 Q_0 Q_2

QUANTITY OF
HOUSING
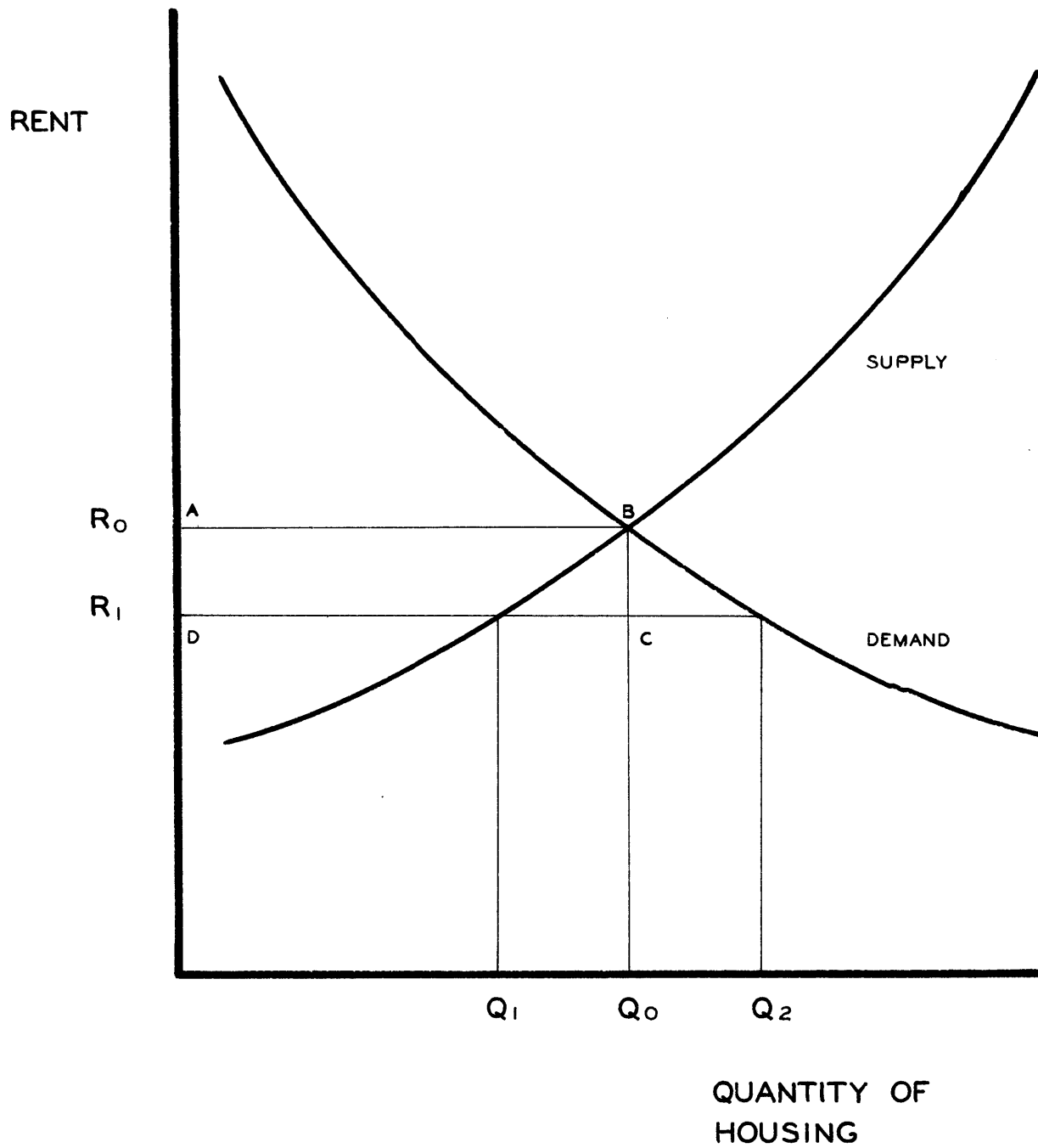
IMPACT OF RENT CONTROL
ASSUMING FIXED OUTPUT
OF HOUSING

FIGURE ONE

If the output from the housing stock is fixed, then, the argument runs, the benefit to tenants is the area ABCD. Until owners can remove the apartments from the market the dwelling units will continue to produce an output of Q_0 units of housing although they can only command a rent R_1, the ceiling rent, dictated by rent control.

This approach to the impact of rent control neglects the issue of deterioration in housing units. If a housing unit is capable of a variety of different output levels, then the owners will attempt to adjust the output of each dwelling so as to have it producing the amount of housing units of service that will provide maximum return.[14] This means that under rent control, a landlord may permit the output of his apartment to decline through a deterioration in the quality of the unit. If the rent control policy does not impose a reduced rent on the landlord who permits his dwelling to deteriorate, then the landlord may offset any revenue loss due to rent control with reduced investment in maintenance. This may allow the landlord to continue to earn profits under rent control assuming that the reduction in investment is sufficiently large as to fully compensate for the revenue loss due to rent control.

Because there is an option to disinvest in a dwelling unit so as to adjust the return on investment despite rent control, it is necessary to recognize that a dwelling is capable of a variety of output levels. Each landlord is constantly faced with cost and revenue functions and is therefore confronted with the ongoing problem of adjusting the output of his property so as to maximize his return. This means, as will be more fully detailed later,

there may or may not be a benefit to tenants. There is no automatic gain
to tenants since the level of output of housing is not fixed as in the
constant output argument but is, instead, capable of change. The issue,
then, will center around the property owners investment decision and their
choice of what is the optimum output level for their apartments.

Third, it shall be assumed here that rent control is a revenue constraint.
The landlord is permitted any combination of units of housing service and
price per unit of housing service as long as the product of the two does
not exceed the maximum rent allowed for the controlled apartment. This
is to say that rent control is not a constraint on the price of housing
expressed in terms of dollars per unit of housing service but is a con-
straint on the total revenue generated by an individual apartment indepen-
dent of the quality of that unit. This is a reasonable assumption as the
Rent Control Board does not actively enforce the code requirements written
to prevent downgrading of the housing stock. If the apartment deteriorates
from the quality level that existed at the time of initiating rent control,
the landlord is not forced to lower the rent charged for that apartment
unless the tenant seeks to have a housing code violation order granted.
Several forces militate against this procedure. First, it is difficult to
prove a specific violation. While the deterioration may be tangible, the
manifestation of the deterioration may or may not actually constitute a
housing code violation. Second, it depends upon tenant initiative which
may not be forthcoming since the tenant may not desire to create a conflict
with the landlord. Third, recognition of deterioration is difficult in
the short run. A decline in housing condition can be slow to materialize.

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Especially where there has been a turnover of tenants, comparative evaluation of the quality of a housing unit is difficult. Thus, as the quality of an apartment unit goes down and the rent charged for that unit remains unchanged, then the price per unit of housing service is allowed to rise under rent control.[15]

These assumptions can be applied to the situation existing for the firms operating rental housing in the controlled market. This analysis will not cover the decision processes of the firms seeking to enter the rental housing market, that is, looking to build housing units. It will, instead, deal only with the existing landlords who make up the largest part of the market. Each firm, it is assumed, is producing units of housing service that represent the maximum level of profit for that firm. It has been established, however, that not all landlords seek a profit maximizing position. A study of Boston's triple-decker housing concluded that the landlords' income expectations cover a full range from profit maximization to non-rational investment in the dwelling despite a negative cash flow.[16] It shall be assumed here that this makes little difference to the theories of rent control's impact upon the landlords. First, to the extent that non-rational investment behavior describes the small owner-occupier landlords, this type of landlord is exempt from rent control in Cambridge. Second, because the non-rational investors cannot escape the cost function that faces all landlords, whatever their income expectations, the costs of operating a unit in terms of time, cash expenditure and effort are the same for equivalent dwellings. Thus, the differences between landlords are not the costs that they face but the amount of operating income expected from

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the rents after expenses are paid. Rent control, as a revenue constraint, does not in any way lower costs; it is a limit on the operating income of landlords. To a rational, income-seeking landlord any delimiting effect of rent control is a reduction of the return on investment. To a non-rational landlord the difference is minimal. This type of landlord may continue to invest in the maintenance of his dwelling without calculation of the return received. If rent control reduces the revenue from the dwelling to a point below the total operating costs of the dwelling, fixed and variable, then the revenue loss is a tax on the personal income of this type of landlord. If the landlord continues to maintain his dwelling at a loss, the expenses must, of necessity, be out of pocket. Thus, rent control makes little distinction by landlord type, with or without a decrease in the expenditures for maintenance. Rent control imposes a constraint on the return to investment, whether the landlords calculate it or not.

In order to describe the impact of rent control on these firms, it is necessary to outline the nature of the market forces facing the landlord. The firm responds to the operating income received from the firm's output, which in turn dictates the return on investment. There are three basic determinants of income; the amount of output in units of housing service, the cost function in the market setting the operating expenses necessary with each level of output and the price structure existing in the chosen submarket. As only the decision processes of existing landlords are being considered here, the cost function and the price structure of the market are given. By virtue of already owning dwellings in the city, the landlord has already chosen a particular submarket and has accepted the cost function that operates in the area.

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In Cambridge, the rental housing market varies from neighborhood to neighborhood. This does not mean that generalities cannot be drawn with regard to the impact of rent control throughout the city. It shall be assumed here that the markets for rental housing differ one from another only as a function of the bid rent system operating in the city. In Cambridge, this means the distance of the neighborhood from Harvard Square. The closer the area is to this central place the higher the price structure operating in that submarket. This assumption neglects several other factors such as the various zoning regulations that direct the nature of development in the city or the influence of race on spatial mobility. However, there is evidence that the distance from Harvard Square is a good descriptor of the price variation in the city as a whole. The average gross rents per room for each of the 13 neighborhoods delineated by the Cambridge Department of Community Development vary as would be expected. Those areas immediately around Harvard Square have the highest rents and these rents decrease as the distance from Harvard Square increases. (See Table One, next page.) This indicator does not include the difference between the physical quality of the rooms but, to the extent that rooms are similar units of measure, the tendency that was expected of this simple bidding system was found.

Given that the markets differ as a function of price, for any given level of output in units of housing service, the rents in the submarket will be higher if the submarket price is higher. If price goes up with proximity to Harvard Square, an apartment, as a bundle of units of housing service, will command different rents depending on which submarket it is in. A landlord is not free to select the revenue which he believes will provide a given level of return on investment. The price is set by the market and

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VARIABLE: GROSS RENT PER ROOM PER MONTH

Neighborhood	Distance to Harvard Square (in Miles)	Rent per Room (Dollars)
1	1.97	35.35
3	1.36	57.99
4	1.21	36.64
5	1.06	66.02
6	0.61	61.20
7	0.45	46.34
8	0.45	56.89
9	0.76	63.07
10	0.76	51.04
11	1.67	46.55
12	1.83	33.50
13	1.67	33.33
All	1.15	49.00

CORRELATION ANALYSIS: DISTANCE TO HARVARD SQUARE AND RENT PER ROOM

   R   = - 0.656

   Slope = -14.56   (Decrease of $14.56 per mile from Harvard Square)

TABLE ONE   GROSS RENT PER ROOM BY NEIGHBORHOOD

acts as a constraint on the investment decision. A very high quality apartment in a low priced market will still be subject to the low price of that market despite the quality and this may not justify the high investment needed to produce the apartment. Of the three determinants of income, price is a fixed parameter and is not subject to the control of the landlords.

It will be further assumed here that the cost function faced by the landlords of Cambridge is the same independent of the submarket. This implies that the per unit cost of such components of operating expenses as heat, custodial help or repairs are the same no matter where in Cambridge the apartment is located. The only difference between the costs to one landlord and another is not the submarket in which they invest but the amount of housing service they produce. Greater units of housing produced mean higher costs. Again this is given in the market and is not subject to the control of the landlord.

The only determinant of income left to the landlord is the output decision as to the quality level at which housing will be produced. The landlord may continue to operate the housing at the same level or may alter that level. To raise the level the landlord may invest in capital improvements to generate more revenue or, through disinvestment, may allow the quality of the housing to deteriorate. The issue crucial to the condition of the housing stock is at what level the landlord will operate the housing given the cost and price structure operating in the submarket where the housing is located. To investigate this decision process Rothenberg has proposed a model to describe the investment opportunities before the landlord

with special recognition of the ability of the landlord to vary the quality of his housing.[17]

This model assumes that the cost and revenue functions in the individual submarkets are monotonically increasing with the level of output. Higher quality housing receives greater revenue but with the rate of increase in revenue falling as output increases. Higher quality housing also incurs increasing costs but with the rate of increase rising as output increases.

This assumes that there is not one price in the market but one for each output level. Likewise there is not one cost for operating a unit of housing service but one for each level of quality. The shapes of the cost and revenue functions assumed here follow from the concept that each increment of quality added to a dwelling unit adds to the operating costs of that dwelling. Further, the amount of increase in costs itself increases with each additional increment of quality improvement. In other words higher quality costs increasingly more to operate. Similarly with revenue, each increase in quality results in more rent. But the amount of added value that the market gives to added increments of quality decreases. No proof is offered to establish these curves. A unit of housing services is a hypothetical construct and, as such, is difficult to measure objectively. But calibration of this unit would be required to establish the true shapes of these functions. However, the relationships described conform to conventions that can be expressed most easily at the extremes. At the upper level of quality these functions would suggest that at some point further increases in quality cost more to operate than they are worth in added rents. At the lower level

of quality some investments in improvements are so essential that the value

given to them in the market is greater than the costs of operating them.

For the profit maximizing landlord, the decision is one of making adjustments

in the quality in the housing so as to achieve the highest difference between

revenue and cost. The firm selects its quality or output level such that

the slopes of the cost and revenue functions are equal. The necessary

condition to maximize profit is:

$$\frac{d\ R}{d\ Q} = \frac{d\ C}{d\ Q}.$$

The firm will maintain this position as long as there is no change in the

condition of the market, that is, the cost and price structures remain

constant. If, however, the cost and/or the revenue function do change,

the landlord will seek a new output level so as to maximize his profits.

If this market experiences increased demand, the demand for units shifts

outward. This alters the price per unit of housing service. The immediate

impact of this increase in demand is that the price of housing per unit of

service goes up. This creates a new revenue function which is above the

original revenue function as the proportionate increase in price is assumed

to affect all quality levels. The new demand is willing to pay more for

all housing in the market. However, the increase is not a fixed amount.

The increase is greater for higher levels of housing quality and less for

lower levels. The increase is a percentage increase in the price rather

than a fixed addition to all quality levels. The effects of this increase

are described in Figure Two. The original position of the landlord in the market is with output at level Q_0 and rent equal to R_0. With the increased revenue function an investment opportunity is created and the landlord will seek to adjust his output level in order to capture this opportunity through improvements. That is, unencumbered by rent control the landlord would seek to improve his property and obtain higher rents by moving to position Q_1, R_1.

The extent of this increase in rents and quality is dictated by both the amount of increased willingness to spend on the part of tenants and the elasticity of the supply. In Figure Three the increased demand is indicated by the outward shift in the demand curve. If the supply were completely inelastic the shift would result only in an increase in price. This is, of course, the case in the short run. The increased demand is instantaneous while the adjustments made to the supply take some time. The adjustments in the supply are constrained by such factors as zoning laws, availability of financing and the rate at which landlords react to the increased demand. With time the adjustments are made in the market and a new equilibrium is found with some of the increased demand causing an increase in the amount of housing output and some in increased price.

This means that sitting tenants will be forced to pay higher rents in order to retain the same dwelling units. This condition will continue to exist until the market responds with an increased supply. In the interim a good deal of turnover of units and dislocation of tenants will occur. That is, simply, a price approach to the problem of rationing the scarce housing. Such an approach can be averted with the timely imposition of rent control;

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RENT

REVENUE FUNCTION
WITH INCREASED
DEMAND

R_1

R_0

ORIGINAL
REVENUE

COST
FUNCTION

Q_0 Q_1

QUALITY LEVEL
OF HOUSING
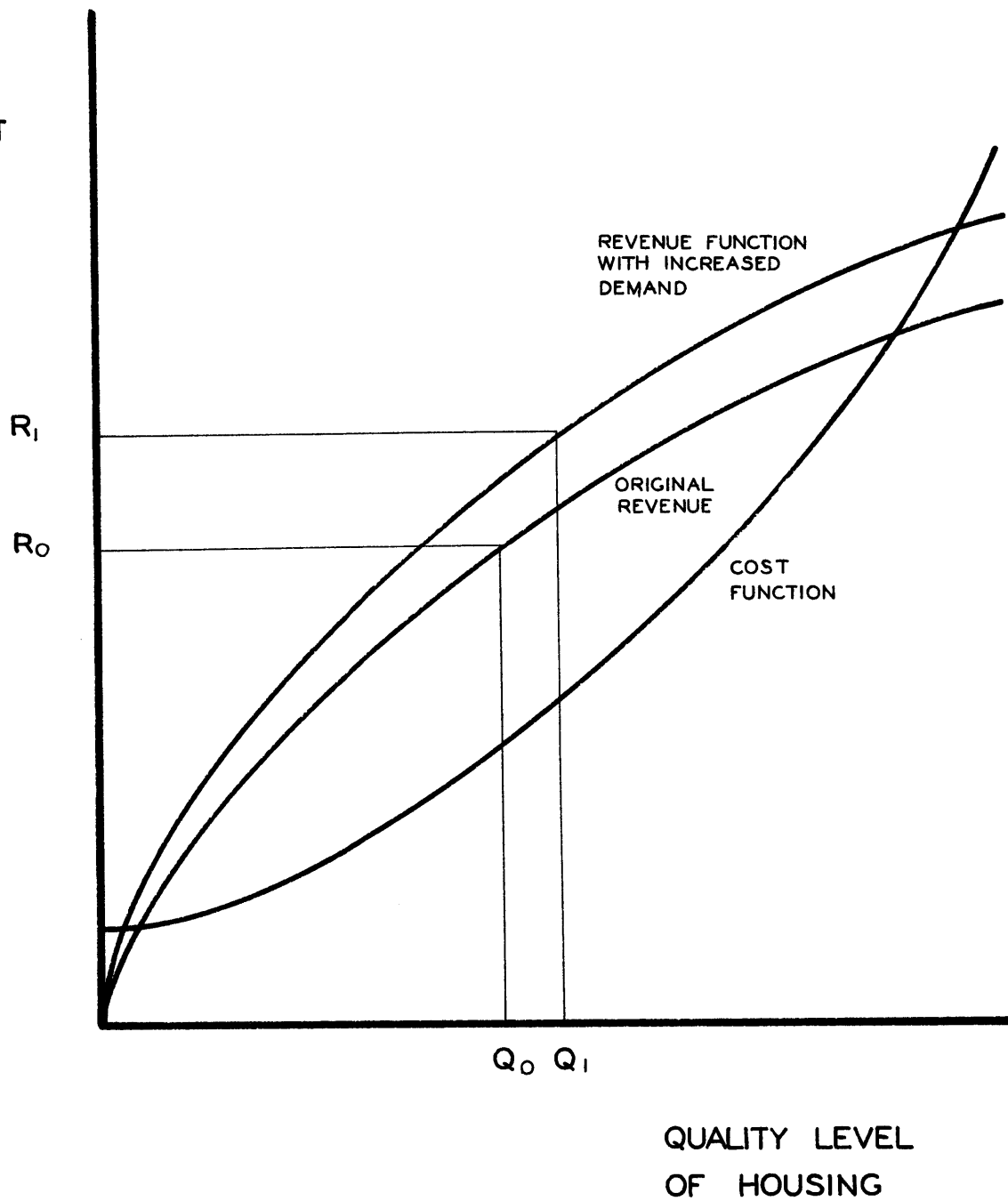
OUTPUT LEVEL OF DWELLING
SO AS TO MAXIMIZE PROFITS

FIGURE TWO

PRICE
PER
UNIT
OF
HOUSING
SERVICE

P_1

P_0

SUPPLY

INCREASED
DEMAND

ORIGINAL
DEMAND

Q_0 Q_1

QUANTITY OF
HOUSING SERVICE
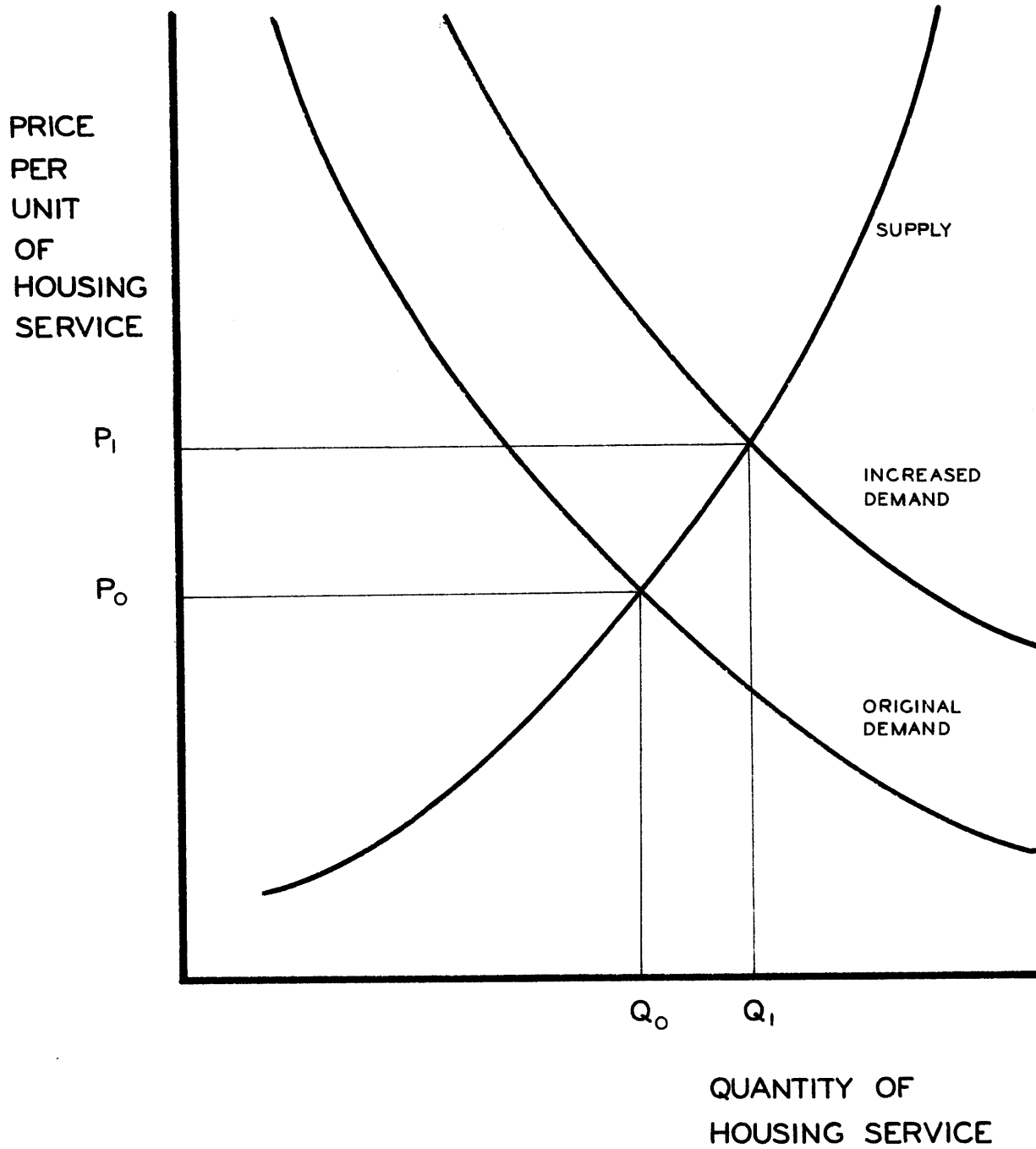
IMPACT OF
INCREASED DEMAND

FIGURE THREE

rent control is imposed so as to prohibit demand-inflated price change. A prime goal is to retain rents at the level that the market allowed before the increase in demand was experienced. To do so rent control must, as the second assumption states, be invoked before the market adjusts to the increased demand with higher prices. If it fails to do so, it must, as was done in Cambridge, roll rents back to that original equilibrium level. In addition, it is assumed that rent control allows for increased rents if the property owner experiences increased costs. In this case the amount of the cost increase is passed through into higher rents but no higher.

Rent control freezes the rents at the level that was operating in the market before the increased demand was experienced. Referring to Figure Four, the landlord has a new revenue function under rent control which follows the curve OBAF. Rents are frozen at the R_0 level unless improvements have been made. If that is the case, the amount of the cost of improvements can be passed through in higher rents but no more. The landlord may of course charge rents below the ceiling level if he chooses. The issue of special importance is at what operating level the landlord will produce housing given the constraints of rent control.

The original profit maximizing position is point A. If the landlord has made adjustments in the quality of the housing the allowed rents are fixed along the section of the revenue function by the curve AF. If the landlord has not increased his output with the increased demand, the allowed rents are level R_0. In either case any increases in rents that were made before rent control are rolled back to the level of OBAF revenue function. In

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RENT

R_1

R_{RC} R_0

REVENUE FUNCTION
WITH INCREASED
DEMAND

F

ORIGINAL
REVENUE
FUNCTION

B   A

COST
FUNCTION

O Q_2 Q_0 Q_1

QUANTITY OF
HOUSING SERVICE
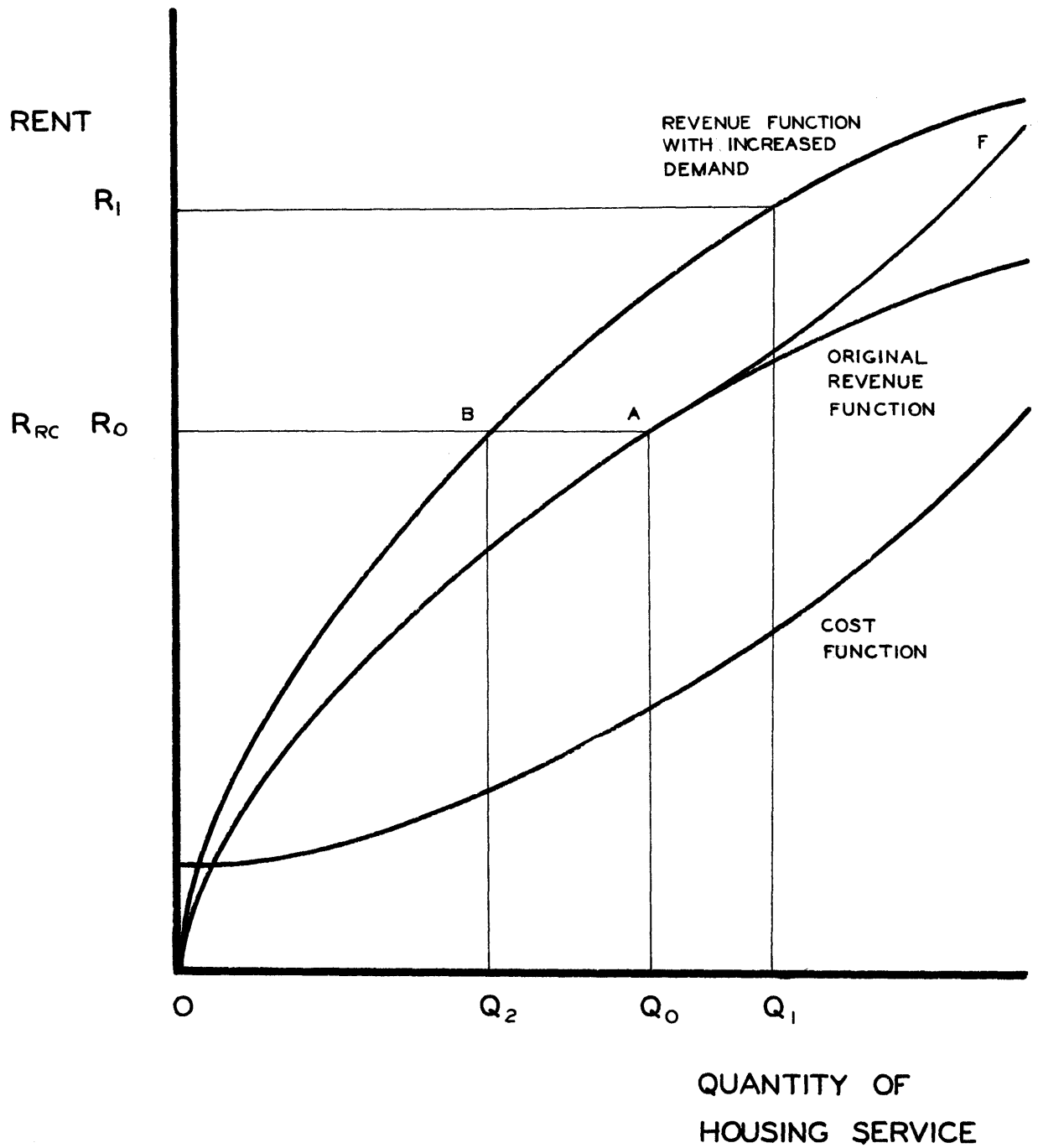
REVENUE FUNCTION
FOR A LANDLORD UNDER
RENT CONTROL

FIGURE FOUR

section AF the return to the investor is the same at all positions along the curve as it was in the initial position with output Q_0. This is because the increase in rents is only enough to cover costs. Thus the portion of the revenue function AF is parallel to the cost function. The property provides no greater return from added improvements. Given no increase in the revenue over costs the landlord will not invest in a higher quality level than the original Q_0 level. If the landlord has already adjusted the output of his housing, the allowed rents are rolled back to the level of return that the landlord was making before the improvements were made.

In the second section, curve BA, the landlord is restricted by the ceiling level Rrc. As the return rises with falling quality level, the landlord will allow the quality of the housing units to deteriorate to level Q_2. This assumes that there is no forced reduction of the ceiling rents with a decline in the output of housing units. In the third section, OB, the optimum position could occur anywhere as both the revenue and the cost functions decline. Thus, the point of maximum return to the landlord could occur anywhere as both revenue and cost functions decline. The point of highest return depends upon the shape of the curves themselves. However, it can be assumed that the new demand brought about a revenue function that is rising at a rate greater than the original curve. This shift in the curve means that the greatest return to quality level will occur as the output moves toward the original position of Q_0. This means that point B will be the optimum position for the operation of the property.

Owners will see it as to their advantage to convert their units down to the quality level Q_2. They will allow their units to deteriorate to a lower

quality level. Note that this is the case even if the ceiling rent is set

at a point equal to the equilibrium level established by the market before

the increased demand occurred. It has been theorized that rent control would

not cause landlords to reduce the quality of their housing if the rents were

frozen at "fair market values" rather than rolled back to some below market

level.[18] What this argument ignores is the presence of the new demand-

inflated revenue function. As long as this new revenue function exists in

the market, it will permit increases in the return to the landlord with

decreases in the quality of the housing at least to the extent that the

increased demand is willing to pay a higher price per unit of housing

service.

This can be further illustrated by plotting quantity of housing service

produced against the price per unit of housing service. In Figure Five,

the point of initial output is point A with an output of Q_0 and a price

per unit of P_0. The initial demand curve is D_0. With the increased demand,

the consumers' willingness to spend income on housing shifts outward from

D_0 to D_1. If the market is allowed to adjust, the new output with this

increased demand is the level Q_1 produced at price P_1. However, when rent

control is imposed the landlord is restricted to rents generated from price-

quantity combinations equal to those realized at the original level of

point A. These combinations are described by the rectangular hyperbola R.

Immediately upon imposition of rent control all rents are rolled back to

the initial equilibrium level of point A. If the landlord has not increased

the quality of his output this is the rent that is allowed. The opportunity

to invest so as to increase return on investment is lost and the incentive

PRICE
PER
UNIT
OF
HOUSING
SERVICE

P_1

P_0

P_2

SUPPLY

B

A

INCREASED
DEMAND

ORIGINAL
DEMAND

R

Q_2 Q_0 Q_1

QUANTITY OF
HOUSING SERVICE
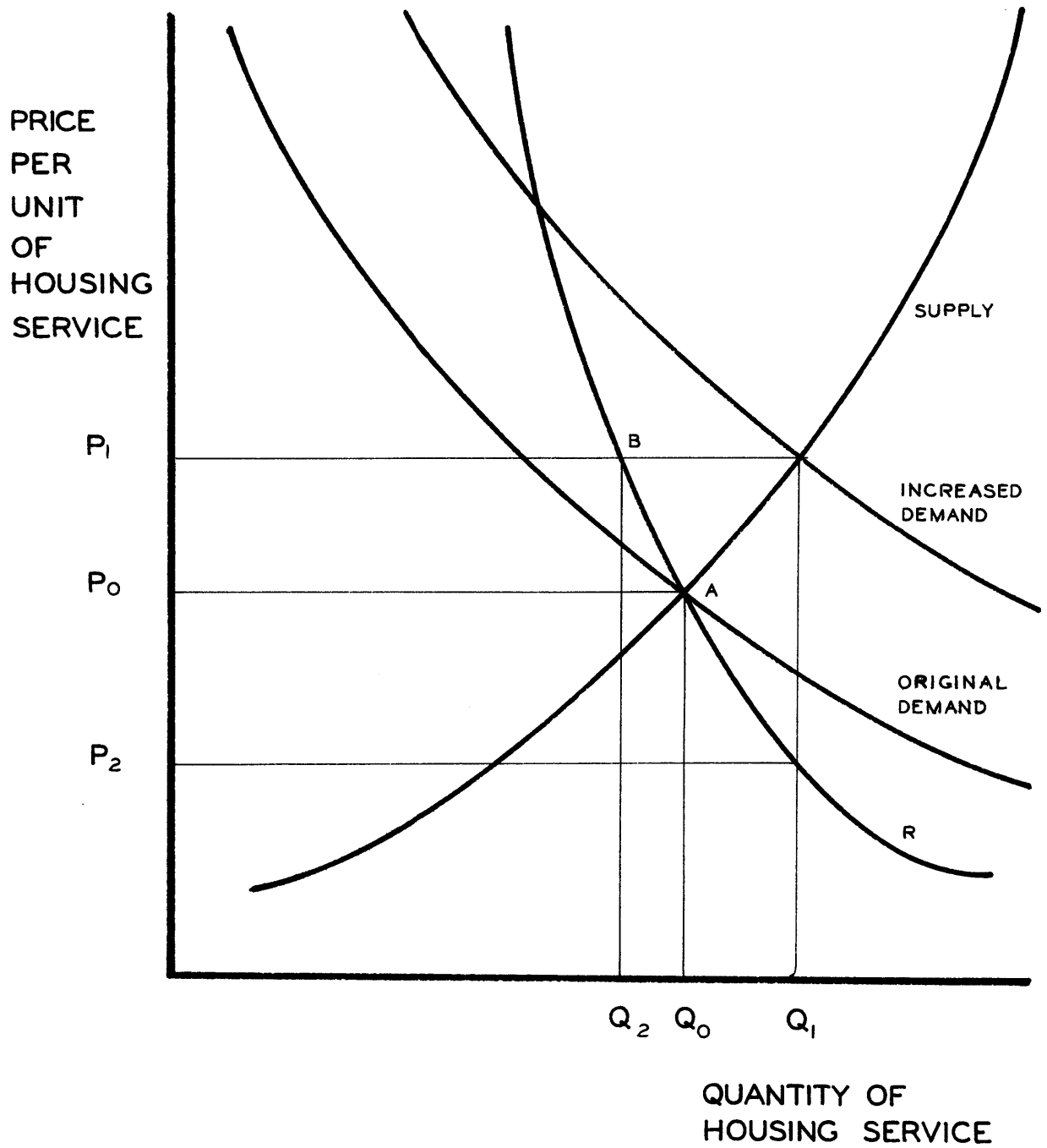
IMPACT OF
RENT CONTROL ON
THE FIRM'S OUTPUT

FIGURE FIVE

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to decrease output to some level below Q_0 is strong as this will permit an increased price of housing. This will continue until point Q_2 is reached, the point beyond which the increased demand is no longer willing to pay the increases in price. Note that at this point the price is above the original equilibrium level and the quality is below the original output level.[19] If the landlord had increased his output to point Q_1 before rent control was imposed, then assuming that an adjustment is granted to the rents, the owner is faced with a higher rent hyperbola reflecting the amount of investment. It is reasonable to assume that this rent level is below the price level that would have occurred without rent control, level P_1, as to grant this increased return is against the policy of the rent control program. Thus, this landlord will be in the same situation, the return on investment is set at the level that it was before the increased demand and the same incentive to disinvest will operate.

The rate of disinvestment is limited however. Even with no investment in maintenance, the dwelling unit continues to provide some output. Thus, the landlord cannot immediately adjust the level of output of housing. The deterioration will occur at a rate fixed by the value placed on the housing even without maintenance and the amount that housing deteriorates in a given time period. It could take a period of several years to reach the new equilibrium position. It will be to the landlord's benefit to allow the output to decline until point B in Figure Four is reached. At this point the market price for a unit of housing has reached the level where the consumers will no longer be willing to pay the same rent for further decreases in the quality of the housing. The uncontrolled market price for a unit of housing has been reached despite rent control. Unfortunately,

reaching this level has come at the expense of the quality of the housing stock.

One other area of interest in terms of the firms' output level is the impact of an administrative failure of rent control to grant increases in rent at the same rate as the rate of inflation of costs. If costs go up by some amount per unit then the cost function will shift upward. In Figure Six this is illustrated by the new cost function C'. If the original profit maximizing position of the landlord is position Q_0 given revenue function R, a new optimal position for the landlord will be reached by lowering the quality of housing unless a new revenue function, R_1, permits rents to increase at the same rate as the rate of inflation of costs. If rent control fails to allow this increased revenue function, then the landlords have an incentive to reduce the output of their housing.

There are then two types of incentives to disinvest, one due to the administrative failure to grant cost related rent increases and the other due to rent control limiting rents below the uncontrolled market level, assuming costs remain constant. The effects of these disincentives are not additive. What is important is the extent of the two disincentives; which has the more extreme impact. It is conceivable that a drastic failure to increase rents with costs could be the more direct cause of deterioration in housing maintenance.

It can be concluded that the landlord operates at the point where return is maximized. Rent control provides the means to increase return on investment with decreased output in existing housing. Rent control denies the

RENT

R_1

R

R'

R

C'

C

Q_1 Q_0

QUANTITY OF
HOUSING SERVICE
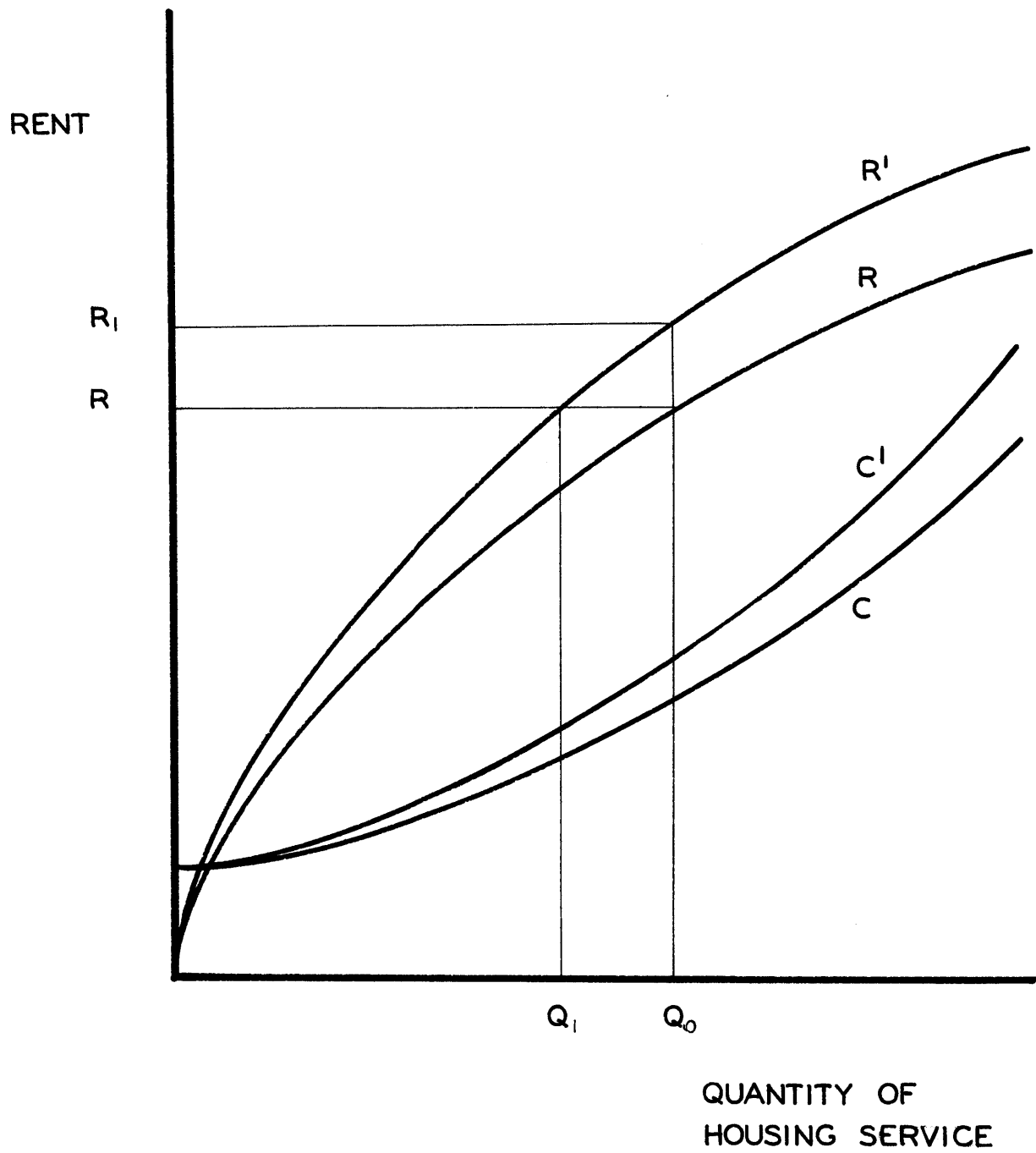
IMPACT OF
COST INCREASES

FIGURE SIX

landlord the opportunity to increase the return on his investment by
limiting the revenue function below the uncontrolled market level. If
rent control further fails to adjust rents with increases in costs, then
another form of incentive to disinvest is recognized by the landlord.
The extent of the deterioration depends upon which is the more severe of
the two market forces.

Turning now to the position of the consumer, it is assumed that the consumer
initially consumes a set amount of housing for a market price in an equili-
brium market. This is the assumption that the market is in equilibrium
before rent control is imposed. In Figure Five the consumer is initially
at position A purchasing Q_0 units of housing service at price P_0 per unit.
The increase in demand shifts the demand curve from position D_0 to D_1.
This shift moves along the relatively inelastic supply curve. The extent
of this shift is the amount of additional value that the consumers give to
housing in the submarket. The shift in supply from Q_0 to Q_1 is the amount
that existing units can increase in quality as a response to the increased
demand. The new level of consumption that would occur without rent control
would be $P_1 \times Q_1$ which is, of course, greater than the initial level of
$P_0 \times Q_0$.

The imposition of rent control freezes rents at the initial revenue-
consumption position before the increased demand was experienced. This
means that the tenants receive an income benefit equal to the difference
between the consumption they would have paid in the market and the level
of consumption they will be provided with under rent control. The sitting

tenants will consume either Q_0 or Q_1 units of housing service depending upon whether or not their landlord responded to the changed market and improved his property. If the tenant lives in a unit that did not improve in quality the rent is frozen such that it does not go above the price P_0. The income benefit in this case is the difference between the consumption of housing at this price $(P_0 \times Q_0)$ and the consumption that would have been required to retain this housing had the rent control policy not been imposed $(P_1 \times Q_0)$. Thus, the income benefit is the quantity $Q_0(P_1 - P_0)$. If the tenant lives in an apartment that did receive improvements before the beginning of rent control the income benefit is calculated in the same manner but the output level is the increased level attained by the improvements, say Q_1, and the price is a function of the amount of the rent increase granted by the Rent Control Board. The amount of price increase or decrease depends upon the Board's decision as to how much of an increase to grant. Given this new level, P_n, the income benefit to this category of housing is $Q_1(P_1 - P_n)$.

This income benefit does not remain constant for either type of housing, improved or unimproved. As rent control fixes the revenue received from a rental unit and not the price per unit of housing service, the income benefit will decrease with deterioration in the quality of housing. As the landlords permit the quality of their housing to decline the price of the housing will then rise and the income benefit to the tenants will decrease. The benefit is the difference between the price permitted by rent control multiplied by the quantity of housing service emitted during the time period in question. That is, $Q_t(P_1 - P_t)$ where the subscript t

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denotes the point in time since the imposition of rent control. As the quality of housing decreased from the position that would have occurred without rent control, the price P_t approaches the market price P_1. Obviously, as this occurs the amount of the income benefit to the tenants approaches zero.

The market may not witness the full development of this process however. The consumer does have some substitutes in the market. As not all of the dwelling units in the market are under rent control, the tenant at some point may prefer to move from the declining controlled market and pay un-controlled market prices for a different and more expensive bundle of housing services so as to receive the improved quality available in the uncontrolled market. This will be a function of the consumers' willingness to spend the increased increment of their incomes for housing, the ability to do so and the cost of moving from one dwelling to another.

It is of interest to hypothesize about the reactions of the sitting tenant to this market behavior. This tenant was part of the market before the increased demand was experienced which brought about the imposition of rent control. This is the tenant residing in the established neighborhood that rent control is intended to protect. It is completely reasonable for this tenant to be unaware of the increased value that has been placed upon the dwelling unit that he consumes when the increased demand occurs in the market. Not having changed place of residence or having had any tangible changes in the condition of the dwelling unit, the units of housing service appear to be no different. However, without rent control, the landlord is

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prompted to raise the rents in accordance with the increases in the value of the dwelling unit, that is, the higher price per unit of housing service.

When rent control is imposed upon this dwelling unit, the rent is frozen at the original level. However, in the long run the quality of the unit will decrease as the landlord reduces or eliminates investment in maintenance. However, the rent paid by the tenant will continue to be the same. Due to rent control, the tenant is paying the same rent for a lower quality of housing service without having moved from the dwelling unit. Had rent control not been introduced, however, the tenant would have had to pay a higher price for the same dwelling although there would have been no increase in the quality of that dwelling.

Rent control then places the consumer with a choice between two markets, one controlled and the other uncontrolled. The controlled market will have reduced rents but declining quality. It will appear to be the better bargain as the price is, at least initially after the imposition of rent control, artificially reduced. The uncontrolled market will have higher prices but with constant or increasing quality. Initially, this is the less preferred choice. However, in the long run, as the quality of the housing declines in the controlled market, this uncontrolled market will become an increasingly better option subject to the cost of moving from the controlled to the uncontrolled market.

The tenant will have a constrained choice in this matter. The problem is that to move from the controlled market is to improve the quality of housing

consumed but at a loss of the income benefits derived from the rent control policy. In the controlled market the tenant continues to reside in the same dwelling unit at an artificially reduced rent. To leave this dwelling unit would be to place a greater drain on personal income due to housing. This is especially true if the rents are set, as is often alleged, below even the initial equilibrium level. This could occur from the failure of the policy administrators to adjust rents with increases in the operating costs of rental housing. When this is the case, the rents in the controlled market are a particularly good bargain. To move from the controlled market is to improve the quality of housing consumed but is also to accept the loss of the income benefits derived from the rent control policy.

It can be concluded that the tenant as consumer of housing receives an income benefit immediately upon the imposition of rent control. The amount of this income benefit decreases with the deterioration of the quality of the controlled housing over time. The consumer is faced with the choice between the lower priced controlled housing market which is deteriorating in quality and the higher priced uncontrolled housing market which is stable or rising in quality. The choice between the two is a function of the price per unit of housing service that the consumer is willing to pay.

THESIS

The assumptions made in the design of the rent control legislation and the theories concerning the impact of rent control upon the rental housing market lead to a two part thesis. First, rent control, as enacted in Cambridge, assumes a relationship between the type of structure brought under rent control and the tenant population that the program intends to serve. If the relationship is strong, then the target populations will be the beneficiaries of rent control. If the relationship is weak or non-existent, then the rent control policy may fail to protect all that it should and may protect many tenants who are not among the target populations. The position taken here is that rent control has failed to protect the target population. Building type is, in fact, a very imperfect indicator of tenant characteristics.

Second, given the fact that rent control places ceiling rents on some though not all rental units, a dual market in rental housing has been created in Cambridge, one with rents controlled by a non-market administrative process, the other free to adjust rents with market pressures. The differences between the branches of this dual market are made significant due to the administrative failure of the Rent Control Board to adjust rents comensurate with increases in operating costs. The effect of this failure is to force rent control landlords to suffer an income loss on their rental property. It has its effect on the demand side by providing tenants with an income benefit that is used, not to improve housing consumption but to supplement non-housing consumption.

The first area of investigation is essentially one of identification of the tenants served by rent control and comparison of the characteristics describing these tenants with those of the target population. From the set of design assumptions and explicitly stated goals of rent control it is asserted that the target population is made up of the poor, the elderly, the long-term residents of Cambridge and the neighborhoods with a high incidence of tenants having these characteristics. This is to say that rent control was not designed to be indifferent as to who receives the benefits of the policy. Its goal is to seek out and protect certain populations. Obviously no program of this type will be able to single out all that it is intended to serve and be able to exclude all that are not the intended beneficiaries. A certain margin for error can be expected without considering the design of the program to be fundamentally in error. However, given that the program purports only to set a fair market ceiling on rents and not to lower them, the concept is that landlords do not suffer from inclusion in the rent control program. It could be expected then that there is no need to resist over-inclusion in the controlled market. Alternatively, to not include all that should be included is a more grievous error. If the program is intended to serve the poor, then it is difficult to reconcile any large scale omission of poor tenants with the purposes of the program. Thus, while the program cannot be expected to clearly identify the exact tenants that it hopes to serve, it can be expected to reasonably include most of the target populations even if that comes at the expense of over-inclusion by controlling rents for many tenant populations that are not among the intended beneficiaries.

The thesis furthered here is that the policy design when applied to the Cambridge rental market distributes very little of its protection to the intended beneficiaries. In fact, rent control in Cambridge tends to protect the very subpopulations from whom the intended beneficiaries are to be protected. Rent control is supposed to serve the established neighborhoods in general and the poor and the elderly residents of the city in particular. These target subpopulations are to be shielded from the incoming households. The policy design depends upon an assumed linkage between the type of structure brought under control and the intended beneficiaries. This linkage, it appears, breaks down in the highly mixed Cambridge housing market. This contention is derived from an examination of the Cambridge renter population and a comparison of the rent controlled tenants with the uncontrolled market tenants.

For the purpose of definition, the elderly are defined as those persons over 65 years old. Definitions of poverty range widely, and precise definitions may be a source of unnecessary complications. To avoid these complications, this problem will be treated as one of finding rent control's relationship with household income of all levels. This approach facilitates two forms of income measurement; first, simple household income as an indicator of the ability to pay for housing and second, the rent-to-income ratio, which is the annual gross rent paid by the household divided by the annual household income. Using both measures of income permits study of both housing burden (high rent-to-income ratio) and overall poverty (low household income). In either case it is assumed that rent control is intended to serve those tenants with the greatest financial problems. This

means that rent control should tend to select its tenants from the lower end of the income hierarchy if it is to serve the poor. Further it should serve the households with higher rent-to-income ratios as it should protect those whose housing costs constitute a larger drain on income.

If rent control is to protect the "established" neighborhoods of Cambridge this implies an underlying definition of which areas of the city are considered to be subject to the invasion of the new household and which are relatively immune. Several characteristics lend themselves to this process of neighborhood definition. First, by definition the invading households would not have been long-term residents of the city while the households that may be displaced would be the tenants who have been long-term residents of Cambridge. Thus, the neighborhoods that are served by rent control should display a tendency for the residents to have been long-term residents. It is possible that the neighborhoods served by rent control could be dominated by short-term residents and still be protecting the established households as part of the over-inclusion principle. However, if rent control tends to serve areas that are dominated by newcomers to the city then it would appear that the neighborhood does, in fact, serve a more transient group of tenants. It is difficult to see how this could be considered an "established" neighborhood. Thus, if the policy is to inhibit the disruption of established neighborhoods, then it seems fair to expect rent control to be protecting areas where predominantly long-term residents now live.

Another factor that may help to identify the areas that are to be served by the rent control policy is the "town-gown" split of the city. Much of

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the rationale for rent control assumes that students are much of the problem, if not the problem itself. Therefore, non-student neighborhoods should tend toward the controlled rather than the uncontrolled markets. This is especially true of those areas in the path of expanding student demand.

A third identifying characteristic is the nature of the household protected. To the extent that the established neighborhoods are believed to be populated by traditional families, the rent controlled population should show a tendency to include husband-wife families and families made up of related members as opposed to groups of unrelated households. This suggests a premise that transient populations are made up of unrelated households and that long-term residents are from traditional families. In a city with a large number of student households, this does not seem to be an unreasonable concept. Thus, it may be asserted that the rent control population should tend to protect the related households rather than the unrelated households and should particularly cover the neighborhoods characterized by this type of household.

To reiterate, the decision as to whether or not the tenants will receive the benefits of rent control is determined entirely by the type of building in which they live. A building is brought under rent control if it was built before 1969 and is not an owner-occupied two or three family structure. The policy must assume that the building type is a predictor of the population that is to be served. The first part of the thesis questions the accuracy of this assumption. The test is the examination of the tenantry covered by rent control, the tenantry not covered and the types of neighborhoods covered.

The second part of the thesis deals with the problems that ensue from the creation of a dual market in housing, one controlled and the other uncontrolled. The distinction between the two has meaning if, and only if, the rents permitted in the controlled market are lower than the rents for comparable apartments in the uncontrolled market. If this is the case the landlords must suffer reduced earnings in terms of reduced operating income as a percentage of total income from their rental property and, tenants may transfer these benefits into different housing consumption or may use the benefit as a subsidy for non-housing consumption.

The landlords are supposed to receive the protection of the Rent Control Board's actions to increase the ceiling rents equal to the increase in expenses paid by landlords. This means that the actual dollar amount of operating income should remain constant. If, as is claimed to be the policy of the Cambridge Rent Control Board, the buying power of the landlord's operating income is to be maintained, then rents must increase such that operating income as a percentage of the total rent roll remains constant. Supposedly this is an incentive to the landlords not to reduce the quality of their housing. Given the discretionary power vested in the Rent Control Board there are a variety of situations that could be created for the landlord depending upon the level of rents permitted.

The impact of the Rent Control Board's decisions can be assessed by comparing the changes over time in the operating income of controlled rental property with the changes in operating income in the uncontrolled market.

If rents are frozen at what is considered to be a level of equilibrium in the market then the revenues to the landlord under rent control are initially determined by a fair market process. But, as has been suggested in the Rothenberg model of the housing market, when the landlord is confronted with the increased revenue function due to increased demand, a new set of choices not seen in the equilibrium market is created. Given the fact that the marginal revenue of decreased investment is zero (the landlord will receive the same rent for reduced investment), it is economically rational for a landlord to reduce the quality of housing under rent control. This is true even with rents set so as to keep operating income constant.

This situation can be exacerbated by the introduction of cost increases and the limited ability of controlled property to obtain higher rents as a result of increased costs. This ability obviously depends upon the behavior of the Rent Control Board. They will, it is assumed, adjust rents to some extent. However, the amount of the adjustment may just cover the amount of the cost increase, it may be less or it may be greater so as to maintain a constant value of the return to the landlord. If the rent adjustment is equal to the amount of the cost increase, the dollar amount of operating income is held constant and the landlord has the same amount of money to spend on debt service and profit. Thus, his return on equity is the same in dollar terms, but the value of his profits is less, given inflation. If the rent adjustment is less than the amount of the cost increase then the situation is, of course, worse. The value of the profit is less as is the amount of operating income. In either of these two cases the rental property becomes a less desirable investment as the operating income as a percent of gross income is less.

If the adjustments in rents are sufficient to maintain the level of operating income as a percent of gross income, then the adjustment must be greater than the amount of the cost increase. It may not, however, be necessary to make this full adjustment in order to maintain the buying power of the landlord's profits. As virtually all of the financing of rental property is repaid in level constant payments, then the component of operating income going to retire debt need not be increased. However, if the landlord is to avoid loss in real terms, then the component of operating income going to profit must increase with the rate of inflation.

Thus, any adjustment that does not maintain the real value of the landlord's profit is, in a sense, a more extreme case of the output decision position described for a landlord after the initial imposition of rent control upon an equilibrium market. Where the landlord in the equilibrium market had an incentive to reduce output in order to maximize revenues, the landlord confronted with a reduced real value of his profits is similarly inclined to disinvest in his property. However, in this case the rents have not increased at the same rate as the rate of inflation. Rents in real terms have declined. This tends to make rent control housing an even better bargain than was the case with the initial condition of rents frozen at the equilibrium level. Therefore, tenants will be willing to accept an even greater reduction in the quality of the controlled housing before they will prefer the higher priced uncontrolled market as an alternative. As the landlord has an incentive to reduce his output to the point that the market will allow, the decline will be the rational alternative for him to follow. The limit to this decline is the point at which the price of

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housing per unit of service has increased to the maximum the consumer will pay before preferring the uncontrolled market.

The central issue in all three of these situations is the level of rents; have they been adjusted so as to maintain, increase or decrease the operating income generated by the property? This obviously depends upon the behavior of the Rent Control Board in granting adjustments to the rental property. But the impact of these adjustments can be assessed only through comparison with the uncontrolled market. A simple finding of a decreased net operating income as a percent of gross income to controlled property is insufficient to establish that rent control is at fault. If the uncontrolled market is also experiencing a decrease in operating income then the impact of rent control can be estimated only by the difference between the two rates of decline. For rent control to be a factor the decline in operating income must be greater in controlled property than in uncontrolled property.

Other factors could still enter into the comparison. If the costs of operating rental property in the uncontrolled market follow a different inflationary trend than those of the controlled market, then the operating incomes of the two markets could be different without rent control having had an effect. It shall be assumed here that the cost of operating rental property is roughly the same for all areas in Cambridge. Variation certainly does exist for different types of structures, and the expertise of one landlord may differ from another such that the actual expenses could be very different. However, the costs per unit are not likely to differ radically. Such components as the per unit cost of heat, payroll and

utilities probably differ little between equivalent apartments in the two markets. For these reasons it can be assumed that the cost function facing the two markets are the same. If a difference in operating income exists, it can be assumed to result from the different revenue functions operating in the two markets. The uncontrolled is given a market rent and the controlled is forced to accept the rents granted by the Board.

The key to this dual market problem is, then, the behavior of the Rent Control Board. If the Board has failed to raise rents comensurate with the increases in expenses, then it has established a rate of decline in operating income for controlled housing. If that rate is greater than the rate of decline in operating income in the uncontrolled market, then an income loss has been imposed upon the property owners by the rent control policy.

The other side of the dual market issue is the response by the tenants. If, in fact, the rents are artificially lowered by rent control, two responses can be envisioned. First, the tenant could change the amount of housing that he will consume. If rent control housing is available at a lower cost, as will be the case when the Board has not allowed rents to increase with costs, then the controlled stock is the better bargain of the two. The tenant can get either the same amount of housing in the con- trolled market at less cost or more housing at the same cost. If the tenant opts for the approach of consuming the larger amount of housing at the same level of expenditure, the tenant may move into an apartment that produces more units of housing service for a price that would not be available in the uncontrolled market. This is a process that can easily

occur in Cambridge. Many apartments turn over each year due to the largely transient student population. In addition many of the tenant households are unrelated and therefore can adjust their size to respond to changed housing consumption. If rents are lower in the controlled market the households could form into smaller sizes so as to enjoy a less crowded apartment without having to pay market rates for this luxury. This trend could be tested by the existence of a lower housing utilization rate among tenants in the controlled housing, especially among unrelated and student households.

Second, the tenants could continue to consume the same amount of housing that they would consume in the private market but do so at a reduced rent. This reduced rent is then an income benefit to tenants as the reduction of rent frees an equivalent amount of disposable income for other, non-housing consumption. This makes rent control an especially controversial type of housing program in that it may transform the income loss to landlords not into improved housing consumption by the tenants but into increased consumption of non-housing goods.

The key test of this response to rent control is the housing utilization rates in the two markets. If it is found that rent control permits a lower rate of housing use, then to some extent the benefits of rent control are being returned to the housing market through a less intensively used housing supply. If the presence of rent control has no effect on housing usage, then the benefits of rent control are going to non-housing consumption.

This form of analysis relies on the assumption that there is a relationship between the quality of housing, that is, the output in units of housing

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service, and the number of rooms in the apartment. If a household improves

its housing consumption, it increases the number of rooms that it rents

or forms a smaller household for the same number of rooms. This approach

may neglect moves between apartments of the same size but with an upward

movement in quality. As the controlled market was all constructed before

1970 the range of quality is somewhat constrained insofar as higher quality

means a newer apartment. A range of size of apartments is available in

the controlled market with the mean number of rooms being 4.13 and the

standard deviation being 1.61. Thus, it is not entirely unreasonable to

assume that a quality increase means a lower housing utilization rate.

The key contentions tested in this research are two. First, the rent

control policy selects its beneficiaries by the type of building in which

they reside. In Cambridge building type is not a good indicator of tenant

characteristics. The result is that rent control tenants are not the

intended beneficiaries. Second, the administration of rent control in

Cambridge has imposed income losses on landlords which tenants transfer

into income benefits to non-housing consumption.

DATA SOURCES AND RESEARCH METHODS

The primary source of data for this research is the 1975 partial census
of Cambridge made available by the Department of Community Development of
the city.   This census covered approximately 4% of the city's population
or some 1,400 households and 3,700 persons.   The sample surveyed was
selected so as to be representative of the entire city.   Information was
obtained on both social and housing characteristics of the respondents.
Social characteristics include, among other things, race, household
income, household size and occupation.   Among the housing charactertistics
recorded are the rent paid by tenants, the cost of utilities if paid by
the tenant, the number of rooms and the location of the residence in the
city by census block.[20]

Unfortunately the census did not code the cases by whether or not the
tenant lived in a rent controlled apartment.   This necessitated the
coding of the cases by a separate means.   Toward this end a separate data
base, the Rent Control Board Master File, was used.[21]   This file contains
data on the location of all controlled apartments and the rents allowed
for those apartments.   The problem was to join the two data sets.

In order to protect the confidentiality of the respondents in the census
the addresses of the cases were not entered into the data set.   The only
locational material was the census tract and census block.   Thus, it is
impossible to say with certainty whether or not an individual case is or
is not under rent control.   In order to get around this problem each block
covered in the census was coded by the incidence of rent control in that

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block. The number of dwelling units in each block was obtained from the

Department of Community Development's housing inventory, the addresses of

all structures in each block were obtained from the Assessor's maps of the

city and the addresses of all rent controlled units were obtained from the

Master File of the Rent Control Board. Given this information it was

possible to find the percentage of the total number of dwelling units in

each block that are in the rent control market. This percentage becomes

the probability that each case is included in the rent control market.

The new variable, incidence of rent control, becomes the key variable in

the examination of the social and housing characteristics. It can be used

to identify whether or not the variation in the cases' incidence of rent

control is associated with variation in other variables, particularly those

variables that rent control is intended to address such as income and age

of tenant. Further, this incidence of rent control variable can be used

to select cases to be in one of two samples; one controlled households and

the other uncontrolled households. For this purpose, any case with an

incidence of rent control value of less than 30% was placed in the uncon-

trolled sample, and any case with a value of greater than 70% was placed

in the rent control sample. All remaining cases were considered indeter-

minate.

These values were chosen in a trade-off between representativeness of the

samples and confidence in their accuracy. To narrow the range of values

in each sample (choosing a value greater than 70 and less than 30) would

increase the probability that the sample members are actually part of the

universe that they are to represent. However, to do so excludes census

blocks from the samples sacrificing the breadth of their geographical distri-

bution throughout the city. Because these objectives work in opposite

directions, it was necessary to find a middle ground. The values chosen

provide both a fair geographical distribution over the city and reasonable

confidence that they are actually drawn from the market that they represent.

Two other divisions were made in the census sample. Only those blocks

that did not contain public housing were included in the statistical analy-

sis. This was because the rents in the public sector are not subject to

the control of the rent control policy nor are they part of the uncontrolled

market process. They are set by the agency in charge of the project and

represent not a fair market rent but the amount that the government is

willing to subsidize the cost of operating the project. For this reason

this portion of the uncontrolled market which does not represent a free

market determination of rents was excluded from the samples altogether.

Also the census was screened selecting only rental tenure cases. The

design of the rent control Act in no way seeks to alter the market process

dealing with homeownership. To include homeowners in the study would be

to include cases with little meaning in terms of the rent control Act.

The final data base is, then, made up only of tenants in the private rental

market with each case coded by the incidence of rent control for the block

in which they reside.

Given this data base the first step was to test the issues raised in the

subpopulation identification portion of the thesis. In order to describe

the distribution of the population a frequency distribution was plotted

along a large set of variables. These variables were age of tenant, length

of residency in Cambridge, type of household, household income, gross rent

per apartment and per room, rent-to-income ratio and a breakdown of these

characteristics by neighborhood. Tables have been compiled describing these

distributions.

The next step was to test for significant differences between the samples

to see if the theories of who is and is not served by rent control are borne

out. This was done by a series of tests for the probability that the

differences between the samples' mean values of test variables could occur

simply by chance.

More specifically, samples were drawn from the data as a function of some

criterion variable such as age. The mean value of some test variable such

as incidence of rent control was then calculated for the samples. The

means were then compared to see if the difference could reasonably be

attributed to the effects of the criterion variable or the effect of

sampling error. In all cases if the probability of the difference between

the means of the test variable occurring by chance is less than 0.05, then

the difference is considered to be statistically significant.

Three sets of tests of this sort were performed with different test variables.

Using the incidence of rent control as the first test variable, samples were

chosen along two criterion variables. These were age, whether or not the

tenant is over 65 years old, and student status, whether or not the tenant

is enrolled in an area college or university. Household type was tested

through the use of pairs of samples with each pair comparing a single

household type against the remainder of the cases. The household types are husband-wife families, single-parent female head, single-parent male head, other related adults, single individuals, unrelated groups of two to five persons, unrelated groups of six or more persons and mixed related and unrelated persons. The neighborhoods were tested by creating samples from each of the thirteen neighborhoods delineated by the Department of Community Development. Each test was made comparing one of these individual neighborhoods samples against a sample containing all the cases not in that neighborhood.

A second set of tests was made using household income as the test variable. The criterion variable was the incidence of rent control used to define the controlled and uncontrolled samples described earlier. This test was run three times, first for all households to see if any differences in income exist for the rent control and the uncontrolled populations, second to test the issues but only among households made up of elderly persons and, third to test the issues but only among non-student households.

The third set of tests was performed using housing utilization rate, measured in persons per room, as the test variable. The criterion variable was, again, the incidence of rent control used so as to create the samples representing the controlled and the uncontrolled markets. This test was run four times to compare the intensity of housing use between controlled and uncontrolled samples including all households, only elderly households, only households made up of related persons and only households made up of unrelated persons.

After the frequency distributions were run and the difference of means tests were completed, possible relationships between rent control and the various metric housing and social characteristics were identified and tested for significance through the use of correlation analysis. This third and final set of statistical tests were run to see if, in fact, there is a relationship between the variable incidence of rent control and a variety of other variables that are descriptive of the intended operation of rent control and the rent-to-income ratio, the length of residency in Cambridge, the age of the tenant, the gross rent per apartment and per room, the household income and the housing utilization rate. As with the difference of means tests the relationships were considered to be significant if the probability of the observed relationship occurring by chance is less than 0.05.

The second major area to investigate is the impact of rent control upon the revenue received by the landlords. Initially it was hoped that the data from the 1975 census could be used in this phase of the analysis. The goal was, using regression analysis, to formulate an expression describing the impact of rent control upon the rent that an apartment will command and an expression describing the impact of rent control upon the amount of rent that a household is willing to spend. This would, on the supply side, indicate whether or not any income loss occurs when, controlling for many other supply characteristics, the unit is in the rent controlled market. In an equivalent manner but this time on the demand side, this would indicate whether or not the presence of rent control affects the tenants' willingness to spend on housing controlling for differences in the social characteristics of the tenants. This analysis

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would have provided the means to test the impact of rent control on the market by defining the extent of revenue loss to landlords and the extent of income benefit to tenants.

However, the results were such that no statistically reliable conclusion could be made. (These results are presented in Appendix A.) For this reason it was necessary to utilize different data sources in order to determine whether or not there has been a revenue loss to rent control property.

Information on the income from rental property, the operating expenses to rental property and the net operating income to controlled property is available from the Rent Control Board.[22] The Board has engaged in several studies to assess the behavior of expenses to rental property in Cambridge. This information has been pooled with the pattern of general adjustments to rental property to derive information on the operating income received. This can be compared with the level to which rents would have risen had they been adjusted according to the rate of inflation for all goods and services. This provides the means to compare the controlled property and the uncontrolled property assuming rents in the uncontrolled market rise with inflation. Checks of this approach can be made by comparing this information with that of the Institute of Real Estate Management.[23] The Institute publishes annual reports of the expenses and income to rental property in the greater Boston area. As this is data from actual rental property it can be considered as descriptive of the trend in rental housing income and expenses in the area.

Specifically, the Rent Control Board data will describe the changes in expenses and rents in the controlled market indicating the rate of change in operating income, that is, income after expenses are paid. This rate can be compared to the same rates for the uncontrolled market through two different approaches. First, the rate of change in the amount of actual operating income remaining to controlled property can be compared to what it would have been had this rate kept pace with inflation, that is, had the real value of operating income been held constant. Second, the rate of change in the amount of operating income as a percentage of gross income to the controlled property can be compared with the equivalent rate found in other Boston area markets. Any difference between the rates of change of operating income between the two markets is an indication of the income loss to rental property due to rent control.

FINDINGS

An analysis of the data sets was performed and the findings reported here.
The findings are presented by the characteristic being tested. The
accompanying tables present the numerical outcomes of the statistical
tests.

The first variable tested was household income. If rent control is to
serve the poor the analysis should find a strong negative relationship
between incidence of rent control and household income. The relationship
found was negative but very weak. (See Tables Two and Three.) The correla-
tion coefficient was -0.0628 with a significance of 0.043. When samples
from the two markets were compared for the mean household income it was
found that the mean income for the uncontrolled market is $12,167 with a
standard deviation of $8,994. The controlled market has a mean of $10,632
with a standard deviation of $7,902. The difference between the means is
not statistically significant. The large standard deviations indicate
broad distributions of income in both samples. If it can be assumed that
students are not the intended beneficiaries of the rent control policy and,
as student incomes tend to vary widely, then the relationship may be tested
including only those tenants that are non-students. When this was done
the difference between the two market samples became even less with a mean
for the controlled sample of $11,030 compared to $12,063 for the uncon-
trolled sample. It can be concluded that rent control is virtually indif-
ferent to the income of the tenant. Both markets appear to have a broad
range of household incomes including high, moderate and low income house-
holds.

VARIABLE: HOUSEHOLD INCOME

DIFFERENCE OF MEANS TEST

Group	Sample	Cases	Mean	Std Dev	T Value	T Prob
All Households	URC	212	12167	8999	1.93	0.054
	RC	214	10632	7902		
Non-Student HH's	URC	174	12063	9044	1.17	0.244
	RC	182	11036	7568		

CORRELATION ANALYSIS: INCIDENCE OF RENT CONTROL AND HOUSEHOLD INCOME

R   = - 0.0628

Sig =   0.043

TABLE TWO   HOUSEHOLD INCOME ANALYSIS

VARIABLE: HOUSEHOLD INCOME

ANALYSIS OF FREQUENCY DISTRIBUTION

Group	Income in 1000's: 0-5	5-10	10-15	15-20	20-25	Total
Uncontrolled						
Number of Households	46	54	51	25	16	192
Percent of Group	24.0	28.1	26.6	13.0	8.3	
Rent Controlled						
Number of Households	65	65	53	30	16	229
Percent of Group	28.4	28.4	23.1	13.1	7.0	
All Households						
Number of Households	174	209	169	96	55	703
Percent of Group	24.8	29.7	24.0	13.7	7.8	

TABLE THREE   HOUSEHOLD INCOME DISTRIBUTION

If the policy does not select tenants according to absolute poverty, it may be asked whether or not the policy selects tenants that suffer from a higher housing burden. This burden is measured by the ratio of rent to income. If rent control is to protect those tenants for whom housing is a greater drain on their incomes then a strong positive relationship should be found between incidence of rent control and rent-to-income ratio. The correlation is significant at the 0.025 level but weak as the coefficient is +0.06. (See Table Four.) This weak relationship indicates that there is effectively no relationship between rent control and housing burden.

The next variable examined was the age of the tenant. If rent control is to serve the elderly, a strong positive relationship would be expected between incidence of rent control and age of tenant. No effective relationship was found as the correlation coefficient is -0.06 and the significance value is 0.003. (See Tables Five and Six.) However, the policy is less concerned with the full spectrum of age than it is with just the elderly, those over 65 years old. To test this the tenants were divided between two groups, those over 65 and those under 65, and these groups compared for the incidence of rent control. The mean for the elderly sample is 44.3 while that of the non-elderly is 50.8. The difference between the means is significant at the 0.007 level. This indicates a tendency for the elderly to live in the uncontrolled market. It may be, however, that the policy is not concerned with all of the elderly but only with the protection of the poor elderly. To test this possibility the mean household income of the elderly households in the controlled market was compared with that of the uncontrolled market. These means were found to be insignificantly different.

VARIABLE: ANNUAL GROSS RENT AS A PERCENT OF HOUSEHOLD INCOME

ANALYSIS OF FREQUENCY DISTRIBUTION

Group	Rent as Percent of Income 0-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50+	Total
Uncontrolled	47	32	36	18	15	13	7	4	32	204
	23.0	15.7	17.6	8.8	7.4	6.4	3.4	2.0	15.7	
Rent Controlled	45	44	28	24	21	10	9	6	53	240
	18.8	18.3	11.7	10.0	8.8	4.2	3.8	2.5	22.1	
All Households	159	133	106	67	52	42	24	18	134	735
	21.6	18.1	14.4	9.1	7.1	5.7	3.3	2.4	18.4	

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CORRELATION ANALYSIS: INCIDENCE OF RENT CONTROL AND RENT BURDEN

$R = + 0.0636$

$Sig = 0.025$

TABLE FOUR   GROSS RENT AS PERCENT OF INCOME ANALYSIS

VARIABLE: AGE OF TENANT

DIFFERENCE OF MEANS TEST (Tenants' Incidence of Rent Control)

Group	Cases	Mean	Std Dev	T Value	T Prob
Under 65	2173	50.77	26.96	-2.68	0.007
Over 65	132	44.50	26.25		

CORRELATION ANALYSIS: AGE OF TENANT AND INCIDENCE OF RENT CONTROL

$$R = -0.0569$$

$$Sig = 0.003$$

DIFFERENCE OF MEANS TEST (Elderly Households' Income)

Group	Cases	Mean	Std Dev	T Value	T Prob
Uncontrolled	34	8062	9497	0.72	0.475
Rent Controlled	15	6600	4680		

TABLE FIVE   AGE ANALYSIS

VARIABLE: AGE GROUP

ANALYSIS OF FREQUENCY DISTRIBUTION

Group	Age in Years: 1-18	18-24	25-34	35-44	45-54	55-64	65+	Total
Uncontrolled								
Number of Tenants	107	124	240	35	30	37	53	626
Percent of Group	17.1	19.8	38.3	5.6	4.8	5.9	8.5	
Rent Controlled								
Number of Tenants	76	182	272	35	16	12	29	622
Percent of Group	12.2	29.3	43.7	5.6	2.6	1.9	4.7	
All Tenants								
Number of Tenants	432	534	838	155	117	97	124	2297
Percent of Group	18.8	23.2	36.5	6.7	5.1	4.2	5.4	

TABLE SIX

AGE DISTRIBUTION

It can be concluded that the elderly tend to live in the uncontrolled market and that rent control is indifferent to income among the elderly population.

The next variable examined was the length of residency in Cambridge. If rent control is to serve the long-term residents and protect them from the influx of new household into their neighborhoods then a strong positive relationship would be expected between incidence of rent control and length of residency in the city. The opposite was found. Significant negative relationships were found testing both with all tenants and just non-student tenants. (See Table Seven.) Among all tenants the correlation coefficient is -0.128, and among only non-student tenants the correlation coefficient is -0.166. These relationships are still weak, but they indicate a tendency for rent control tenants to have been residents of Cambridge for a shorter amount of time than is the case for tenants in the uncontrolled market.

The next area of analysis covers an attempt to identify what, if any, selection bias rent control has according to household type. The first and most general test was between households made up of related members and those made up of unrelated members. The related households have a mean rent control incidence of 48.3, and the unrelated sample has a mean of 55.3. (See Tables Eight and Nine.) The probability of this difference occurring by sampling error is less than 1 in 1000 indicating a tendency for unrelated households to be in the rent controlled market and the opposite for the related households.

VARIABLE: LENGTH OF RESIDENCY IN CAMBRIDGE IN YEARS

ANALYSIS OF FREQUENCY DISTRIBUTION

Group	Years Residency: 0-1	1-2	3-5	6-10	11-20	20+	Total
Uncontrolled	94	83	94	55	162	526	1050
	17.9	15.8	17.9	10.5	7.2	30.8	
Rent Controlled	128	104	116	75	26	103	552
	23.2	18.8	21.0	13.6	4.7	18.7	
All Tenants	355	310	374	234	117	491	1881
	18.9	16.5	19.9	12.4	6.2	26.1	

CORRELATION ANALYSIS: LENGTH OF RESIDENCY AND INCIDENCE OF RENT CONTROL

Subpopulation	Correlation Coefficient	Significance
All Households	-0.1280	0.001
Non-student Households	-0.1657	0.001
Student Households	+0.0774	0.120

TABLE SEVEN

LENGTH OF RESIDENCY ANALYSIS

VARIABLE: INCIDENCE OF RENT CONTROL BY HOUSEHOLD TYPE

DIFFERENCE OF MEANS TEST

Household Type	Cases	Mean HH Type	Mean Others	Std Dev	T Value	T Prob
Husband-Wife	342	47.50	54.47	27.37	-3.72	0.000
Single Female Head	53	50.17	52.23	24.71	-0.53	0.597
Single Male Head	4	69.00	52.05	16.87	1.23	0.220
Other Related Adults	38	49.74	52.22	24.47	-0.54	0.588
Single Individuals	285	56.62	50.21	27.25	3.30	0.001
Unrelated 1-5	234	53.80	51.61	28.80	1.01	0.313
Unrelated 6+	3	55.00	52.11	26.00	0.18	0.856
Mixed Fam/Unrelated	18	49.83	52.16	26.83	-0.35	0.723
All Related	437	48.31	55.30	26.71	-3.94	0.000
All Unrelated	522	55.30	48.31	27.94	3.94	0.000

TABLE EIGHT   HOUSEHOLD TYPE ANALYSIS

VARIABLE: HOUSEHOLD TYPE

ANALYSIS OF FREQUENCY DISTRIBUTION

Group	Household Type: HW	SPFH	SPMH	ORA	SI	UI5	UI6	MRU	Total
Uncontrolled	101	13	0	9	73	61	1	7	265
	38.1	4.9	0.0	3.4	27.5	23.0	0.4	2.6	
Rent Controlled	74	11	1	11	123	78	1	5	304
	24.3	3.6	0.3	3.6	40.5	25.7	0.3	1.6	
All Households	324	53	4	38	285	234	3	18	959
	33.8	5.5	0.4	4.0	29.7	24.4	0.3	1.9	

HW   - Husband-Wife Family
SPFH - Single Parent Female Head
SPMH - Single Parent Male Head
ORA - Other Related Adults
SI   - Single Individuals
UI5 - Unrelated Individuals in Groups of 5 or less
UI6 - Unrelated Individuals in Groups of 6 or more
MRU - Mixed Related Unrelated

TABLE NINE   HOUSEHOLD TYPE DISTRIBUTION

This tendency to serve certain household types was further tested by comparing pairs of samples with the pairs being made up of one sample including households of only one type and the other sample containing all the remaining households. Only two household types emerged as having significantly different incidence of rent control values. These are the husband-wife families and the single individual households. These two types do, however, make up a large part of the total tenant population with 34% of the total households being husband-wife families and 30% of the total being single individuals households. The husband-wife households showed a tendency toward the uncontrolled market with a mean rent control incidence value of 47.50 compared to 54.47 for all other households. The difference is significant at less than 0.001. The single individual households have a mean incidence value of 56.62 compared to 50.21 for the remaining households with the difference significant at 0.001 indicating a tendency toward the controlled market.

If these two household types tend toward different markets in a significant manner, then a comparison of these two groups by income, length of residency and occupational status may indicate differences between the groups beyond just household type. (See Table Ten.) First, comparing husband-wife families with single individual households by income it was found that husband-wife families have a higher income with a mean of $13,203 compared to $7,183 for the single individuals, but they obviously have more members in their household for whom they must provide housing. Second, in terms of length of residency the husband-wife households have been residents longer than is the case for the single individual households. This difference is significant at the 0.20 level. Third, occupational status was measured by

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VARIABLE: COMPARE HUSBAND-WIFE FAMILIES VERSUS SINGLE INDIVIDUALS

DIFFERENCE OF MEANS TEST

| Group	Cases	Mean	Std Dev	T Value	T Prob
Test Variable: Household Income					
Husband-Wife	310	13204	8174	+10.43	0.000
Single Individuals	305	7183	5951		
Test Variable: Percent Professionals					
Husband-Wife	383	29.7	45.8	-2.60	0.009
Single Individuals	358	38.8	48.8		
Test Variable: Length of Residency in Cambridge					
Husband-Wife	383	4.21	1.79	+2.33	0.020
Single Individuals	358	3.89	1.86		

TABLE TEN   COMPARISON HUSBAND-WIFE FAMILIES WITH SINGLE INDIVIDUALS

the percentage of each household type with the head of household being a professional. Using completion of a college education as an indicator of professional status, the single individual households have a significantly higher percentage of professionals at 38.8% than is the case with husband-wife families with 29.8%. This difference is significant at the 0.009 level.

If as is indicated here, rent control tends to benefit some categories of tenants more than others, then the next area of analysis is to question if rent control tends to be dispersed evenly throughout the city or if the neighborhoods differ in any significant manner in terms of incidence of rent control. For this purpose the division of the city into neighborhoods as delineated by the Cambridge Department of Community Development was employed. These neighborhood boundaries tend to follow main roads and railways. (See Diagram, next page.) The incidence of rent control in each of these neighborhoods was determined and these values compared to find geographical trends in the policy's impact.

It was found that those neighborhoods with a tendency toward the uncontrolled market are numbers 1 and 4 in East Cambridge and numbers 10, 11, 12 and 13 in West Cambridge. Those with a tendency towards the controlled market are numbers 6 and 8 in Mid-Cambridge. Even for those neighborhoods where the incidence of rent control is not sufficiently strong one way or the other to consider them statistically significant, the trend is instructive. (See Table Eleven.) Those neighborhoods with a negative sign for the test statistic, indicating a tendency toward the uncontrolled market are numbers

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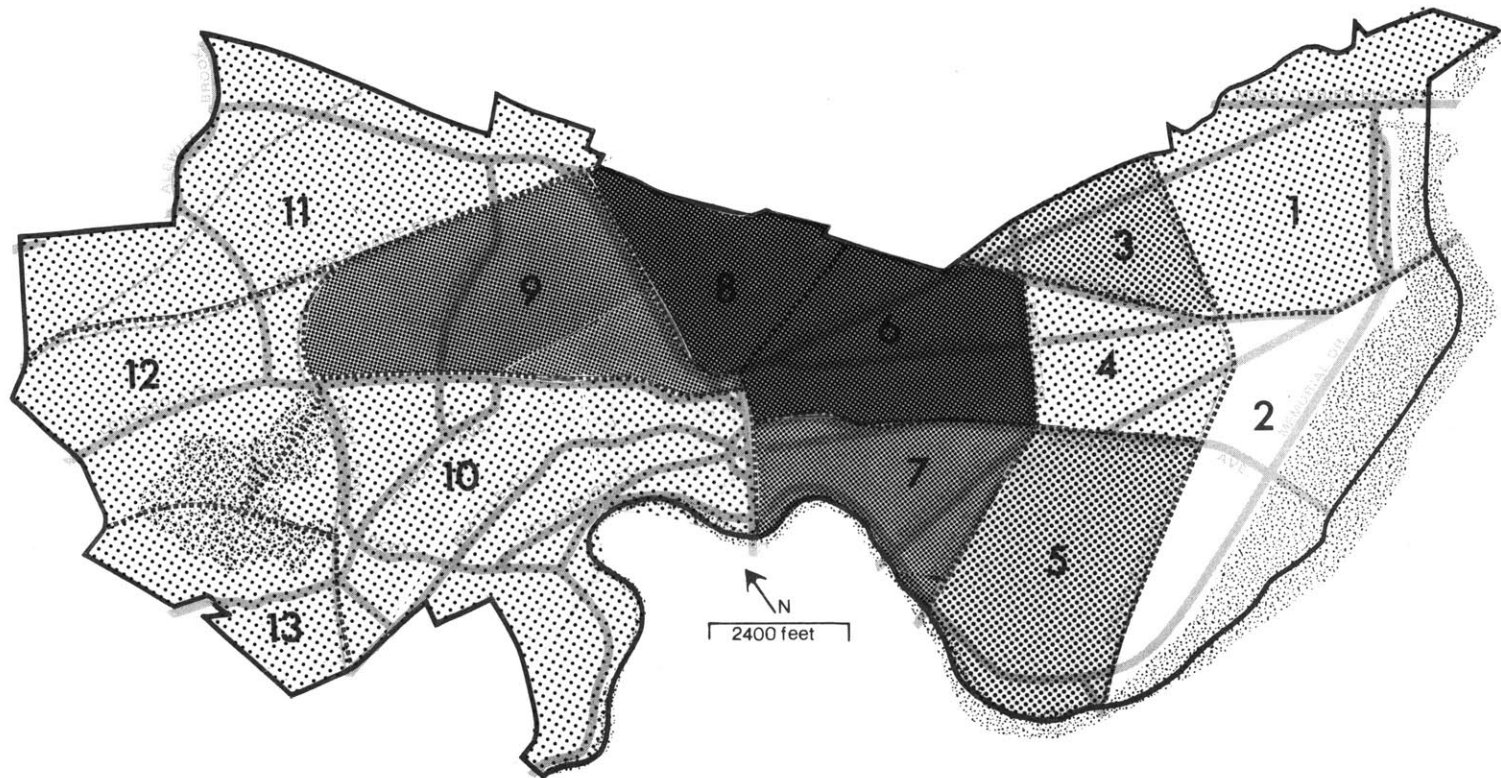
SIGNIFICANT TOWARD RENT CONTROL
WEAK TOWARD RENT CONTROL
WEAK TOWARD UNCONTROLLED
SIGNIFICANT TOWARD UNCONTROLLED
NON-MARKET

FIGURE SEVEN   INCIDENCE OF RENT CONTROL BY NEIGHBORHOOD

VARIABLE: INCIDENCE OF RENT CONTROL BY NEIGHBORHOOD NUMBER

DIFFERENCE OF MEANS TEST

Neighborhood	Cases	Mean Neigh	Mean Others	Std Dev	T Value	T Prob
1	50	42.48	52.65	17.73	- 3.80	0.000
2	0	-	-	-	-	-
3	73	55.67	51.83	26.44	- 1.10	0.638
4	80	42.52	52.99	18.10	- 4.68	0.000
5	88	50.05	52.33	19.91	- 0.98	0.329
6	211	72.97	46.24	18.99	+16.37	0.000
7	74	56.23	51.77	30.21	+ 1.34	0.182
8	75	62.97	51.20	10.86	+ 7.47	0.000
9	123	53.78	51.87	32.34	+ 7.47	0.534
10	75	35.72	53.51	24.47	- 5.44	0.000
11	84	19.63	55.32	21.42	-14.25	0.000
12	3	8.00	52.26	0.00	- 2.78	0.005
13	23	32.13	52.61	11.39	- 8.06	0.000

TABLE ELEVEN   NEIGHBORHOOD ANALYSIS

1, 3, 4 and 5 to the east and numbers 10, 11, 12 and 13 to the west. Number

2 is the M.I.T. campus and as a non-market area was not included. Those

neighborhoods with a test statistic that is positive, indicating a tendency

toward the controlled market are those to the east and north of the Harvard

campus. The uncontrolled areas tend to be those further away from Harvard,

i.e. East Cambridge, North Cambridge and the Fresh Pond area.

If these are the neighborhoods selected by rent control and the policy tends

to select certain types of households to serve, then there should be a

selection in the types of households that reside in these areas. To test

this the controlled neighborhood households were pooled as one sample and

compared with a sample made up of the households from the uncontrolled

neighborhoods. (See Tables Twelve and Thirteen.) As expected, the con-

trolled neighborhoods tended to be student areas, 28% in the controlled

areas as compared to 15% in the uncontrolled. They also tended to be the

areas with professionals, 49% compared to 25%. But the biggest difference

and, thereby, what may be the best descriptor of the controlled market

tenants is the household type. The controlled neighborhoods have 69% of

their households made up of unrelated members while the uncontrolled

neighborhoods have 39%. While no significant relationship was found between

gross rent and incidence of rent control, a test between the controlled and

uncontrolled neighborhoods illustrated that the controlled areas tend to

have higher per room rents (a mean of $60.20 per room compared to $42.11)

indicating that the controlled areas are given a higher value by the market

independent of whether or not the apartment is controlled or uncontrolled.

(See Tables Fourteen and Fifteen.)

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VARIABLE: COMPARE RENT CONTROLLED NEIGHBORHOODS VERSUS UNCONTROLLED NEIGHBORHOODS

DIFFERENCE OF MEANS TEST

Group	Cases	Mean	Std Dev	T Value	T Prob
Test Variable: Percent of Tenants that are Students					
Uncontrolled	1108	15.34	36.1	- 6.09	0.000
Controlled	643	27.99	44.9		
Test Variable: Percent of Tenants that are Professionals					
Uncontrolled	1108	24.8	43.2	-10.10	0.000
Controlled	643	48.7	50.0		
Test Variable: Percent of Households Unrelated Members					
Uncontrolled	399	39.35	48.9	- 8.01	0.000
Controlled	305	68.52	46.5		
Test Variable: Gross Rent per Room					
Uncontrolled	384	42.11	20.88	- 9.16	0.000
Controlled	297	60.20	28.64		

TABLE TWELVE   NEIGHBORHOOD COMPARISON

VARIABLES: MEAN NEIGHBORHOOD VALUES

ANALYSIS OF NEIGHBORHOOD CHARACTERISTICS

Neighborhood	Income	Rent per Apt	Rent per Rm	Rooms per Apt	Persons per Rm	Length Residen	% Non White	% Student	% 65+
1	11481	152.98	35.35	4.49	.681	3.68	18.5	22.3	5.2
3	9392	197.42	57.99	4.11	.679	3.34	10.7	21.7	9.0
4	8074	154.70	36.64	4.29	.640	2.64	25.2	34.2	5.5
5	8353	231.64	66.02	3.54	.723	3.40	10.0	33.8	21.7
6	11658	220.74	61.30	4.06	.539	2.54	17.2	43.2	4.2
7	9295	202.47	46.34	4.68	.504	2.91	27.3	45.6	4.3
8	10798	248.69	56.89	4.57	.490	3.09	15.3	47.6	9.6
9	7730	231.37	63.07	4.03	.538	2.97	26.5	42.2	9.2
10	10989	256.56	51.04	5.09	.439	3.06	26.7	34.4	8.9
11	8135	190.93	46.55	4.57	.635	2.41	43.3	42.3	4.1
12	-	195.00	33.50	6.00	.542	4.30	-	-	-
13	8622	168.26	33.33	5.00	.662	2.71	28.0	30.6	7.6

TABLE THIRTEEN   NEIGHBORHOOD CHARACTERISTICS

VARIABLE: GROSS RENT PER APARTMENT PER MONTH

ANALYSIS OF FREQUENCY DISTRIBUTION

Monthly Rent per Apartment:

Group	000 -100	100 -125	125 -150	150 -175	175 -200	200 -250	250 -300	300 -350	350 -400	400 -450	450+	Total
Uncontrolled	6	11	28	30	37	75	31	20	4	5	5	252
	2.4	4.4	11.1	11.9	14.7	29.8	12.3	7.9	1.6	2.0	2.0	
Rent Controlled	13	18	28	48	52	76	37	9	11	3	4	299
	4.3	6.0	9.4	16.1	17.4	25.4	12.4	3.0	3.7	1.0	1.3	
All Households	36	54	106	136	152	225	102	57	26	9	19	922
	3.9	5.9	11.5	14.8	16.5	24.4	11.1	6.2	2.8	1.0	2.7	

CORRELATION ANALYSIS: INCIDENCE OF RENT CONTROL WITH GROSS RENT PER APARTMENT

R   = + 0.0039

Sig =   0.452

TABLE FOURTEEN

VARIABLE: GROSS RENT PER ROOM PER MONTH

ANALYSIS OF FREQUENCY DISTRIBUTION

Group	Monthly Rent per Room: 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100+	Total
Uncontrolled	0	3	25	60	62	50	21	13	5	3	10	252
	0.0	1.2	9.9	23.8	24.6	19.8	8.3	5.2	2.0	1.2	4.0	
Rent Controlled	0	3	12	66	73	46	39	19	20	10	11	299
	0.0	1.0	4.0	22.1	24.4	15.4	13.0	6.4	6.7	3.3	3.7	
All Households	1	25	79	221	214	148	103	50	33	18	9	371
	0.1	2.7	8.6	24.0	23.2	16.1	11.2	5.4	3.6	2.0	2.4	

CORRELATION ANALYSIS: INCIDENCE OF RENT CONTROL WITH GROSS RENT PER ROOM

   R   = + 0.0400

   Sig =   0.108

TABLE FIFTEEN   RENT PER ROOM ANALYSIS

Having identified the "who" and the "where" of rent control the analysis

shifts direction to attempt to identify what if any market impact results

from the policy. At issue is whether or not rent control forces rents below

fair market levels thereby imposing a revenue loss on landlords and providing

an income benefit to tenants. Unfortunately, only aggregate data are

available for this portion of the analysis and, therefore, all units are

treated as the same. This data can, however, provide an indication of the

expenses and incomes to rental property. (See Table Sixteen.) The first

issue is the rate of change of expenses. It has been found that they have

increased at an annual rate of about 8% per year since 1970. This of course

describes expenses as a whole. Individual components of operating expenses

have had vastly different changes since the imposition of rent control, most

notable of which is the increased cost of heating oil since 1970. This 8%

figure was derived by taking the Bureau of Labor Statistics rate of infla-

tion for each component and adjusting it for its contribution to total

expenses. Thus an overall rate of increase of costs was constructed.

This rate of increase of costs can be compared to the average rate of

increase of controlled rents. Changes in rents are a function of two forces,

general adjustments granted by the Rent Control Board to all eligible

units and individual adjustments sought and obtained by individual landlords.

In order to reflect both influences on rents, the level of allowed rents

was determined by the actual rents allowed to all units and averaged by the

total number of units rather than taking just the average apartment rent

allowed upon the imposition of rent control and adjusting it for the amount

of general adjustments made by the Board. It is important to note here that

VARIABLE: INCOME, EXPENSES AND NET OPERATING INCOME TO CONTROLLED PROPERTY

ANALYSIS OF OPERATING INCOME

Year	Actual Income	Actual Expenses	Expenses % Income	Actual Op Inc	Op Inc % Income	Income Adj CPI	Op Inc Adj CPI	Op Inc % Inc Adj CPI
1967	119	52	43.7	67	56.3	119	67	56.3
1968	119	54	45.4	65	54.6	122	68	57.7
1969	133	58	43.6	75	56.4	130	72	55.4
1970	150	66	44.0	84	56.0	142	76	53.6
1971	154	72	46.8	82	53.2	154	82	53.2
1972	154	79	51.3	75	48.7	163	84	51.5
1973	154	83	53.9	71	46.1	172	101	58.7
1974	156	93	59.6	63	40.4	192	129	60.8
1975	164	100	61.0	64	39.0	207	107	51.7
1976	172	104	60.5	68	39.5	218	114	52.3

TABLE SIXTEEN   INCOME AND EXPENSES BY YEAR

these figures do not merely reflect the rents allowed to apartments as a matter of right. Had the landlord not sought and obtained an individual adjustment he would not have experienced a rate of rent increase as great as is depicted here. This is to say that the annual rate of rent increase is not automatic; rather it is a function of the initiative and expertise of landlords in seeking and obtaining individual rent adjustments. Even with this factor included it was found that rents have increased at an inflation rate of only 3% per year.

It is difficult to tell the full story by simply comparing the 3% increase in rents to the 8% in expenses. In the years prior to 1970 when rent control was enacted rents had been increasing at a rate of about 10% per year. The rate of inflation for these years, 1967 to 1970, was about 7% per year. This indicates that there was some increase in rents over and above the rate of inflation of expenses during this period. Because the amount of operating income to rental property was increasing faster than the amount of expenses, the real value of the operating income was increasing. However, after the imposition of rent control the operating income as a percentage of income dropped from 56.0% in 1970 to 39.5% in 1976. Therefore, the real value of the operating income to the landlord has decreased.

Net operating income will fall as a percentage of gross income any time the rate of increase in rents does not keep pace with the rate of inflation of expenses. This means that the absolute value of the rent increase expressed in actual dollars will have to be more than the absolute value of

the expenses increases, also in dollars, for the return to the landlord to be stable. Anything less will mean a decreased real value of the operating income. However, rents may increase at a dollar for dollar pace with increases in expenses resulting in a fixed dollar net operating income. At issue is the absolute amount of the rent increases in dollar terms compared to the absolute amount of increases in expenses. From the sample of rental properties studied it was found that the mean monthly cost of operating a rental unit in Cambridge is rising about $6.33 per year. The actual dollar increase in monthly rents has been about $3.67 per year. Thus, even in absolute dollars the increases in rents have not kept pace with the increases in expenses resulting in an actual reduction of operating income each year.

Had rents been allowed to increase with the rate of inflation of other goods and services, then the values of the operating income to landlords would be constant. Had this been the case, the operating income to the landlord would have been stable at the 55% level. In order to maintain this level, the rents would have had to go up by a significantly greater amount than the actual amount of cost increases. Given that monthly rents averaged about $150 in 1970 they would have to have risen about $11.20 per year since then to maintain the level of operating income. This is obviously greater than the annual dollar increase in expenses per unit of $6.33.

As indicated earlier, the net operating income to rental property is not necessarily fixed in real terms. Had the Rent Control Board permitted the rents to rise with the rate of inflation it is conceivable that the net operating income would not have remained constant. This is due to the

national trend of rents to not keep pace with inflation. Data on this trend in the Boston region are contradictory but indicate that the fall in the value of operating income is not great. The Institute of Real Estate Management data indicate that operating income as a percent of gross income is dropping at a rate of 0.55% per year.[24] The Sternlieb study of rental property in Boston indicated a slight increase in the amount of the rental dollar left to operating income for the region.[25] Thus, even accepting the data indicating a drop in the value of operating income, the decrease is considerably less than the decrease imposed by the ceiling rents permitted in Cambridge. While not all of the decrease in the real value of the operating income to controlled property may be attributable to the action of the Rent Control Board, any decrease due to an overall trend in the industry is small.

If there is an income loss to landlords as is indicated with this analysis, then the tenants receive a comensurate income benefit since they are protected from market pressure to pay more for their housing and, thereby, have more income free for purchasing either more housing in the controlled market or more non-housing goods. If the tenant tends to use the income benefit for increased housing consumption, then the effect of rent control is to create a form of housing subsidy; the tenant gets more housing for the same money. If the tenant tends to use this benefit for non-housing consumption, then rent control creates a subsidy to non-housing goods.

The difficulty in measuring this change in consumption patterns stems from the difficulty in identifying a "unit of housing service." If the quality

of the housing has deteriorated significantly, as would be predicted by the economic theories dealing with rent control, then the benefit to tenants is no longer the full amount of the income loss to landlords. The benefit has been reduced by the higher price per unit of service paid for deteriorated housing. In this analysis the extent of deterioration relative to the amount of income benefit is considered to be small such that the income loss to landlords and the income benefits to tenants are roughly equal. This assumption is supported by the very strong demand found in the rent control areas. If the housing stock had deteriorated extensively then there would be a tendency for tenants to leave those areas for the uncontrolled, and higher quality, areas. Demand would fall, and rents would approach the city average. As this has not occurred, there is reason to believe that the extent of loss of income benefit due to deterioration is not great.

In addition there are problems in linking greater housing consumption with the size of the apartment. The test of this issue has been set up as the correlation between housing utilization rate and incidence of rent control. As has been the rule with other correlations found here, the relationship is very weak. The test was run for several types of households, including all households, all student households, all non-student households, all related households and all unrelated households. Only the related and the unrelated households proved to have a significant relationship, but the direction of the relationship is positive. (See Table Seventeen.) This would indicate, if anything, that rent controlled housing is more intensively used than is the uncontrolled housing despite the presumably lower rents. It can be assumed that rent control does not bring about a

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VARIABLES: HOUSING UTILIZATION RATE (PERSONS PER ROOM)

DIFFERENCE OF MEANS TEST

Group	Sample	Cases	Mean HUR	Std Dev	T Value	T Prob
All Households	URC	265	0.518	0.259	-0.66	0.512
	RC	304	0.533	0.273		
Elderly Households	URC	36	0.378	0.171	-1.77	0.082
	RC	20	0.473	0.273		
Unrelated Households	URC	123	0.604	0.253	-0.75	0.456
	RC	97	0.630	0.247		
Related Households	URC	55	0.488	0.156	-1.38	0.170
	RC	87	0.540	0.288		

CORRELATION ANALYSIS: INCIDENCE OF RENT CONTROL WITH HOUSING UTILIZATION RATE

Subpopulation Selected	Correlation Coefficient	Significance
All Households	+ 0.0051	0.437
Student Households	+ 0.0877	0.092
Non-student Households	- 0.0222	0.275
Unrelated Households	+ 0.0739	0.046
Related Households	+ 0.0353	0.021

TABLE SEVENTEEN   HOUSING UTILIZATION ANALYSIS

significant change in the amount of housing consumed (at least of the type indicated by this form of test). This would indicate that persons do not form smaller households in order to utilize the housing in a less crowded manner. People tend to purchase the same amount of housing but simply pay less for it. The income benefits derived from rent control go to non-housing consumption.

ANALYSIS OF FINDINGS

The findings can be summarized best in terms of the original questions asked

of the rent control policy the first of which deals with identification of

the beneficiaries of the policy. Is it serving the poor? The results

indicate that the policy makes little distinction among tenants as a function

of income. What relationship exists between rent control and household

income is weak, and the distributions of income among the two markets are

broad. This means that for all household types high, low and moderate

income tenants are included in each market. Rent control serves as full

an array of tenants in terms of income as does the uncontrolled market.

If it does not select the poor as its beneficiaries, does rent control at

least tend to serve those with high rent-to-income ratios? Effectively, no

relationship was found. There is some indication that the controlled market

serves those with a higher housing burden but, the link is very weak and

cannot be viewed as a successful response to the policy objective. It

appears that rent control tenants do not suffer from a significantly higher

housing burden than do tenants in the uncontrolled market.

Is rent control serving the elderly? No; in fact, there is a significant

tendency for the elderly to be in the uncontrolled rather than the controlled

market. Further, income is not a factor in describing who among the elderly

are to receive the benefits of rent control. While the elderly have a

significantly lower household income than does the remainder of the popula-

tion, rent control does not, as structured now, do much to serve this

subpopulation as they tend to reside in uncontrolled structures.

Is rent control protecting the established neighborhoods? If length of
residency is an indication of what is meant by the term "established," then
at issue is whether or not rent control tends to serve the long-term resi-
dents of the city rather than the new and incoming households. Among
non-student households, which presumably are the households that are to
be protected from the increased demand created by the new households, there
is an indication that rent control tends to serve the short-term rather
than the long-term residents. The relationship is weak but significant;
it certainly is not the strong positive relationship that was expected of
the policy.

If "established" neighborhoods are identified by their household types,
then the findings do not follow from the expectations. Among the individual
household types, the two major categories in the population have significant
and opposing tendencies. Those households made up of related members,
especially the traditional husband-wife families, tend toward the uncontrolled
market. Those households made up of unrelated members tend to the controlled
market with the tendency strongest among the single individual households.
If to protect the established neighborhoods means to protect the traditional
families from the influx of new non-traditional families, then the policy
has done quite the opposite. The beneficiaries of rent control tend to be
the single individuals. These households tend to have been residents of
the city for a shorter length of time and also tend more to professional
occupational status. All of this indicates that it is not the native

Cantabrigian who is being served by rent control but the single professional.

In terms of actual neighborhoods served by rent control these findings coincided with the physical distribution of tenants throughout the city. Rent control tends to concentrate in the Mid-Cambridge area whereas the uncontrolled market tends to the East and West Cambridge areas. These controlled neighborhoods can be distinguished from the uncontrolled ones by the incidence of students, professionals and households with unrelated members. These three household types are heavily represented in rent controlled areas. In the controlled neighborhoods 69% of the households are made up of unrelated members, while in the uncontrolled neighborhoods 61% of the households are made up of related households. Rent control, it appears, tends to benefit the "wrong" household types and the neighborhoods in which they reside.

The second set of questions deals with the market impact of the rent control policy. Have the rents in the controlled market been adjusted with the increases in operating expenses? No; expenses have risen since the inception of rent control, but rents have not kept pace. The inflation rate for expenses has been about 8%, while the rate of inflation for controlled rents has been about 3%. Thus, net operating income for controlled property has not only dropped in real value terms but has also dropped in absolute terms, providing an added incentive for the landlord to disinvest in controlled housing.

How has the operating income to controlled property compared to that of the market as a whole? The data on the aggregate market are mixed, but assuming the worst, the operating income has fallen only slightly in the period since rent control was initiated. Boston metropolitan data indicate that the fall in operating income is at worst less than 1% per year. In any event this fall is considerably less than the rate of deterioration in the value of the return to debt service and profit offered in the controlled market of Cambridge. This rate has been nearly 3% per year. Had rents not kept pace with inflation but had they followed the rate of increase found in the rental market as a whole, the value of operating income would still have declined but at a rate much less than has been imposed by the low ceilings with rent control.

Have the income benefits to tenants gone to improve their housing consumption or their non-housing consumption? Presuming that an income loss to landlords is transferred into an income benefit to tenants by the freeing up of income, rent control may allow tenants to improve their housing condition through the use of this income benefit to purchase more housing. To the extent that this housing consumption pattern can be measured in terms of housing utilization there may not be a particularly strong need for this type of subsidy in the Cambridge market. The mean housing rate is about 0.5 persons per room with the standard deviation from that mean being approximately 0.26. This indicates that the vast majority of the tenant population lives in uncrowded conditions (which are usually defined as situations where the housing utilization rate is less than 1.0). In Cambridge the effects of rent control appear to be minimal along this measure of housing

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consumption. Households do not appear to use their income benefits to increase the amount of housing that they consume. Thus, it would appear that the income benefit to rent control tenants is used for non-housing consumption. As rent control does not show a significant tendency to serve just the poor, this type of income subsidy is particularly hard to justify given that it goes to many without need for an income benefit whatever the source.

To summarize, rent control is not serving the poor, the elderly, the long-term residents or the traditional families in any significant manner. It tends not to serve the neighborhoods in East and West Cambridge. It tends to serve the non-elderly and the professionals and the non-traditional families. It tends to concentrate in the area of Mid-Cambridge, that is, the area around Harvard University. The administration of the policy has failed to maintain the constant real value of the operating income to rental property; in fact, it has failed to maintain even the actual dollar amount of operating income. This means an income loss to all rent control land-lords and an income benefit to non-housing consumption to tenants.

Alternative interpretations of these findings may be suggested. One of the first that can be investigated is the theory that rent control has not failed to serve the intended population because the city is not one single market for rental housing but actually is several individual markets. If the purpose of rent control is to serve just those areas where there is increased demand for rental housing causing rapid inflation of rents, then rent control may be serving its purpose if Mid-Cambridge is that sort of

area. The higher gross rents in this area indicate that the market in this area is tighter. The markets may follow a bid rent system with rents higher as the proximity to Harvard increases. If this higher value placed on nearness to Harvard is much of the source of the increased demand for rental housing and thereby the cause of inflated rents, then possibly rent control has approximated its target population in terms of responding to increased demand. If this is to be the theory supporting rent control, the delineation of the rent control population may be by design. The lack of coverage of the areas of East and West Cambridge is not a problem as, it can be assumed, the lack of increased demand means that the market in these areas is being allowed to function properly.

However, if this interpretation of the findings is, in fact, the description of the real intent of the rent control policy, then several complications arise. If this approach to rent control is the basis of the policy design, then it is difficult to justify the extension of the policy to all neighborhoods of the city. The income loss imposed by rent control is to all controlled landlords not just those in the area faced with increased demand. Income loss to the landlords not in this area is particularly damaging. There is no reason to believe that the cost function confronting these areas is any different from that operating in the remainder of the city, and costs have risen over time. The failure of rents to follow a similar rate of increase forces the landlords to lower their investment in the property at the expense of the quality of housing. The areas with increased demand have the advantage that even with decreased quality of the housing stock, the housing units will be sought after because of the

higher values given to them. This may not be the case elsewhere. Where the demand has not increased, there may be a market disruption due to the new availability of controlled housing at reduced rents. Because rent control units will be on the market at lower rents, the demand may shift towards these units in an otherwise stable market. Rent control may cause the deterioration of the housing in an area unaffected by the cause of rent control, the increased demand.

A second interpretation similar to the first is that rent control does not really seek to identify and protect certain classifications of tenants but seeks to regulate the market in areas where speculators operate. The goal of the policy would then be to prohibit the inflationary practices of this type of landlord. If the policy were actually designed to follow this line of thought, then it can be assumed that excess demand is the market condition that permits the operation of speculators and, therefore, rent control needs only to regulate the areas where excess demand is experienced. This is to say, rent control is needed only in Mid-Cambridge as that is the only area where speculators could operate. If this be so then the rent control policy is highly inappropriate to the task. The policy covers all landlords presumably, many of whom are not seeking to gouge the system. From limited data available on the landlords of Cambridge it appears the Cambridge rental property is owned by many smaller landlords rather than by a few larger landlords.[26] The policy is taxing existing landlords greatly for the benefit of tenants who may not, given their income and future earnings expectations, have a great need for the benefits. The benefits of this policy are going to non-housing rather than improved

housing consumption. In addition the program requires an extensive admin-
istrative machinery to regulate all rents of all controlled housing--all of
this just to stop what appears to be a minority of the landlords restricted
to a small area of the city. A more appropriate response to the need to
inhibit speculators would be the careful enforcement of the violation pro-
visions of the building and housing codes presuming that speculators will
seek maximum return by making no investment in maintenance of the property.
Or a tax on excess profits from the income of rental property could be
levied. This would be easier to administer and would avoid the complica-
tion of income loss to all landlords in the city.

A third possible interpretation would contend that the real purpose of
rent control is simply to inhibit the displacement of tenants in estab-
lished neighborhoods due to the inflation of rents. Even if other, non-
target tenants (not elderly, poor or long-term residents) do benefit from
the program being over-inclusive, this is not a problem. It is considered
a necessary part of a program designed to prevent harm to established
neighborhoods. If this line of argument is correct, then the costs of
over-inclusion should be minimal. They are not. Significant benefits are
being accrued by non-target subpopulations of tenants through the reduc-
tion of controlled landlords' operating income. Inherent in the rent
control policy is the choice to raise operating income by reducing the
quality of housing. As the findings show that the beneficiaries of rent
control are very much a mixture of intended and unintended beneficiaries
living in target and non-target areas, then many of the benefits of the
program are lost to the established neighborhoods' long-term residents.

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The benefits go, in large measure, to the "wrong" tenants. This is the cost of over-inclusion.

In any event, rent control will not, in the long run, eliminate the problem of inflation of rents. The demand must subside or the supply be increased for the price of housing per unit of service to return to the original level in the market before increased demand occurred. Therefore, rent control by itself will not solve the problem; it is a temporary "stopgap" measure. Rent control cannot be considered a permanent policy to be employed to protect established neighborhoods. It must be short-term to avoid a decline in the quality of housing. Further, it must be augmented with an increase in the supply suggesting that a production program should accompany any rent control program where the increased demand is a permanent market condition.

A final, and conceivably more reasonable, interpretation of the findings is that rent control is a tool with very limited use and that its use appears to be incorrect in the market now operating in Cambridge. When initiated in Cambridge the case for rent control may have been justified. Rents appear to have been rising rapidly. The market was tight in that the vacancy rate was very low. The supply may have been slow in responding to the increase demand.

But rent control is a form of revenue constraint upon rental housing and will not by itself eliminate the problems. It in no way increases the supply or reduces the demand; it simply sets a ceiling upon the rents

that can be charged for controlled housing. The administration of the policy is difficult. Even after the very difficult period of initiating the program, the pressures of careful administration of the ceiling rents are plagued with problems. The pressures upon the Rent Control Board to moderate their adjustments in response to factors unrelated to the operating costs of rental property are great. Adjustments granted are at the Board's discretion. They are not tied to some cost increase index. Had they been so indexed the rents would most assuredly have been higher. In the absence of this form of automatic review process the rents have not kept pace with the increased costs of operating rental property. A fair net operating income, mandated by the Rent Control Enabling Act, has not been provided.

The administration of the program is expensive and complicated. It is necessary to maintain a large staff to review complaints, monitor rents and provide for efficient administration of the rents of the entire controlled market, some 20,000 units.

Rent control is designed to serve the poor, the elderly and the long-term residents, but designing a policy to deliver benefits to just these tenants is a difficult task. Tenants are not registered; buildings are. This process has shown itself to be a very imperfect means of providing benefits to just the target populations. Many others receive the benefits as well.

Furthermore, rent control has a negative impact upon the market even if a fair net operating income is maintained. As long as there is an

increased revenue function operating in the market due to increased demand, the landlord has the rational choice of reducing investment in his property. This reduces the quality of the housing but maintains the same rents. This is the means left open to landlords to increase their net operating income in spite of fixed rents. This increase in operating income obviously comes at the expense of the condition of housing because it is obtained by lowering the output, or quality, of the dwelling unit.[27] This is an important point that is often ignored in the debate over rent control. Even to maintain rents at a fair market level is to confront the landlord with the rational alternative of lowering the quality of his housing. When this fact is coupled with the lower operating income provided by a failure of rents to increase with costs, a bad matter becomes worse.

Finally, the benefits of this income loss go to many persons who transfer these benefits into non-housing consumption making the policy a very odd form of housing program.

To the extent that the market has loosened through a slightly higher vacancy rate and increased supply for the target elderly population, the need for rent control is less evident at the present.[28] To the extent that the increased demand is a permanent fixture in the Cambridge rental housing market, then it appears to be concentrated in the Harvard Square neighborhoods. There is no indication that the residents of these neighborhoods are any poorer than the tenant population at large. Thus, they are no less able to withstand the increased prices demanded in the market. In fact, they appear to have greater income available to house themselves

than is the case for the traditional families. The beneficiaries of the rent control policy are certainly better educated and more mobile than the tenants of the uncontrolled market, which indicates that they are more able to fend for themselves than is the population that is supposed to benefit from the rent control policy.

To continue rent control, especially without an automatic cost increase mechanism, would be to further worsen the problem of reducing the income stream accruing to the rental housing landlords. This can result in only one of two outcomes. If the landlord is a non-rational operator who maintains his property no matter what the revenue received, then rent control becomes a tax on his personal income, since the money to pay the increased expenses must come from sources other than rents, that is to say, the personal earnings of the landlord. If the landlord is a rational profit maximizing landlord, he will reduce his variable costs, that is, maintenance. This implies that to continue rent control is to continue to provide benefits to those who are not really the deserving poor at the expense of many who are blameless for the level of rents in the market and at the expense of the quality of housing in Cambridge.

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9. Harbridge House, p. III-22.

10. These implicit goals are derived from a series of interviews with
    persons who have been active in the rent control program. They
    include Councilor Barbara Ackerman; Councilor David Clem; J. Kenneth
    Griffin, Executive Director, Cambridge Rent Control Board; Charles
    Laverty, Tax Assessor and Richard McKinnon, Secretary to the City
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11. Interview with J. Kenneth Griffin, Executive Director, Cambridge
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23. Institute of Real Estate Management, A Statistical Compilation Analysis of Actual Income and Expenses Experienced in Apartment, Condominium and Co-operative Building Operation, Chicago, Editions for years 1969 through 1975.

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26. Derived from a review of the Rent Control Master File and an Interview with J. Kenneth Griffin, Executive Director, The Cambridge Rent Control Board.

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28. Re. vacancy rates: Harbridge House, p. III-22, and re. additional public housing units for the elderly: Interview with Ellen Beatrice, Program Coordinator, Department of Community Development, Cambridge.

29. This regression model is a modified version of the model used to assess the impact of rent control on the rental housing market of New York City by Joseph S. DeSalvo, "Reforming Rent Control in New York City: Analysis of Housing Expenditures and Market Realities," Presented at the 17th North American Meeting of the Regional Science Association, November, 1970.

APPENDIX A: REGRESSION ANALYSIS[29]

A regression analysis was attempted using the data from the 1975 partial census of Cambridge with the goal of determining the extent of income loss to landlords due to rent control and the extent of the impact of rent control upon a household's willingness to spend on housing.

The objective was two equations, one on the supply side and the other on the demand side. The supply equation would have gross rent per month as the dependent variable predicted by the independent variables describing the size, location and condition of the dwelling unit. To this equation would be added a dummy variable indicating whether or not the unit is under rent control to determine if the impact is significant, controlling for all other supply characteristics. The regression coefficient for this rent control variable would be an estimate of the impact of rent control. If the operating assumptions of the rent control policy are correct, the expected value of the coefficient would be zero, indicating that there is no difference between the rents allowed under rent control and under the uncontrolled market. This follows from the theory that rent control is to place a ceiling on rents not allowing them to rise beyond a fair market level. If the coefficient were found to be positive then it would indicate that the rents had been allowed to respond to the inflated demand and that the controlled market was not being held to a desired fair market level. If the coefficient were negative then it would indicate that the rents had been held to a ceiling below a fair market rate, imposing a loss on landlords.

The demand equation would also have gross rent per month as the dependent variable. This time, however, the predicting variables would be descriptive of the household consuming the housing. To this set of variables would be added the dummy variable for whether this household was in the rent control market or the uncontrolled market. The coefficient found for this variable would be the impact of rent control on the tenant's willingness to pay for rental housing, controlling for all the differences in the social characteristics of the households. If the value of the supply impact coefficient is zero, then the expected value of the demand impact coefficient is also zero. This follows from the premise that, if rents between the two markets are the same, then the only difference in the value placed upon the housing by the tenants is the intrinsic value placed upon the housing by such measures as quality or location. Thus, if the rents are the same any willingness to pay more would be an indication that the consumers do value the controlled housing more than the uncontrolled housing. But if the market is structured such that rent control limits rent increases only to fair market levels, then the household will not have to pay more for the controlled units and, therefore, no increased demand will be noticed. The coefficient for the rent control variable in the demand equation would be zero.

If the supply rent control coefficient indicated that rents in controlled housing are higher, then tenants are willing to pay more for the housing and, therefore, this will result in a positive coefficient for the demand rent control variable.

If the supply analysis indicates that the impact of rent control is negative then there are several possibilities for the demand rent control coefficient. It may be zero indicating that rent control has no effect on the tenants' willingness to spend on housing. This means that the rent control tenants are spending the same amount on housing that they spend in the uncontrolled market, and the income benefit to tenants is being spent in the housing market. The subsidy in this case is to housing consumption. If the demand rent control coefficient is negative, it indicates that rent control does reduce the tenants' willingness to spend on rental housing. That is, the same household in the uncontrolled market would spend more on housing, so the income benefit to controlled tenants is going to non-housing consumption. To the extent that this demand coefficient falls between zero and the value of the supply coefficient it would indicate the proportion of the income benefit that is spent on housing and the proportion of the income benefit that is spent on non-housing.

It is also conceivable that the demand coefficient could be positive. This could occur where a threshold effect in housing has been reached with the impact of rent control. If the reduction in the cost of housing due to rent control is such that it prompts the tenants to spend more in order to get a particularly good bargain offered in the controlled market, then the coefficient could be positive. This would correspond to the household that spends more to get into a much nicer controlled apartment but one that is more costly than the one that they would consume in the uncontrolled market.

It was necessary to utilize census block variables due to the problem of the units not being coded individually by rent control status. Thus, the incidence of rent control variable had to be used in lieu of the dummy variable. This necessitated using block means for the other independent variables.

The supply variables include the building information of number of stories, number of apartments, number of basement units, and whether or not there is an elevator. Unit information includes the number of rooms, the number of bedrooms and whether or not the apartment is furnished. The location of the unit is coded by neighborhood and the condition is coded by the percentage of buildings in the census block in each of the six categories of condition as coded in the condition survey performed by the Cambridge Department of Community Development.

The demand variables include household income, household size, household type, ethnicity, race, the percentage of elderly and the percentage of students.

The regression equations are:

$$RENT_k = B_0 + \sum_i B_i \, (\bar{X}_{ik}) + B_{rc} \, (\overline{RC}_k).$$

Where:

$RENT_k$ = Average census block gross rent

B_0 = Constant

$\bar{X}_{ik}$ = Block average for predicting variable i

$\overline{RC}_k$ = Census block incidence of rent control

B_{rc} = Impact of rent control.

The results of the regression analysis are listed in tabular form.

Demand Regression:

$RENT_k$ = 203.07

B_0 = - 37.78

B_{rc} = 0.51   (Standard Error = 21.20)

R Square = 0.3753

Supply Regression:

$RENT_k$ = 203.07

B_0 = 35.89

B_{rc} = - 10.73   (Standard Error = 23.22)

R Square = 0.3706

The results in both equations are not statistically significant. The correlation coefficients for both equations are acceptable with R Square values of .371 for the supply equation and .375 for the demand equation. The supply rent control impact coefficient is -10.73 indicating a $10.73 loss in rents per month due to rent control. However, the standard error of this coefficient is 23.22 making it impossible to reject by traditional standards the opposite conclusion that, in fact, rent control causes no reduction in rents. On the demand side the results are the same. The coefficient is 0.51 indicating a 51¢ increase in demand per month which

is effectively zero. Again, however, the standard error of the coefficient is too large to permit confidence in this estimate as it is 21.20.

In both cases the confidence interval around the estimates is too large to permit drawing inferences from the analysis. What is needed is very much smaller standard error figures so as to permit confidence intervals around the estimates that would permit inferences to be drawn regarding the extent of rent control's impact.

Conceivably, the cause of these high standard error figures is the lack of having each unit surveyed in the 1975 census coded by whether it was in the controlled or the uncontrolled market. This forced the analysis to work with input data aggregated to level of census block which, possibly, caused "noise" to be added to the system. Had the input data been made up of individual households or individual dwelling units, each coded as controlled or uncontrolled, then the regression analysis may well have produced significant findings.

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