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Evidence from New York

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Do Housing and Social Policies Make Households Too Small? Evidence from New York

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Abstract:

      How many adults should live in a house? How do people actually divide themselves up among households? Average household sizes vary substantially, both over time and in the cross-section. In New York City, we find that housing and income maintenance policies exert powerful influences on household size and composition -- more powerful than race, culture, or ethnicity. These policies make households smaller (measured by number of adults). We review arguments why governments might want to influence household sizes, and discern no reason for trying to make households smaller than they would be in the absence of these housing and income maintenance policies. Small average household size can be extremely expensive in terms of physical and environmental resources, higher rents, and possibly homelessness. Our results indicate that New York City may well have too much of it.

Almost all people care deeply about how many people they live with and who those people are. In this paper, we ask whether housing policies and other social policies influence the decisions that people make about household composition. We conclude that they do. Generally, these policies cause New York households to be smaller than they would otherwise be, where size is measured by number of adults. Many housing policies make explicit reference to household size, and so in part our results are not surprising. Housing authorities and homeless assistance units have precise rules about acceptable apartment sizes for different families, depending on size, age composition, gender mix, and relationships. Overcrowding is one of the ills that housing programs are supposed to alleviate, and so we expect some effect on household size. Yet we also find that other policies, like the rules of the food stamp program, exert strong influences on how households form, even though their stated goals have little to do with household composition.

We believe this paper begins to fill a serious gap in the study of housing markets. Housing researchers have paid almost no attention to household formation. Almost all theoretical housing models and academic debates about homelessness and housing policy take household composition as exogenous, even though it is clearly a matter of personal choice.

This omission is perhaps all the more surprising given how much these decisions matter. If households across the United States contained as many people as those in Queens, the nation's entire population could be housed without using any of the housing in either Texas or New Mexico. Put another way, given that the U.S. housing stock is currently valued at over $10 trillion, it's not a bad approximation to say that Americans have invested $1 trillion in leading

2

more solitary lives than the people of Queens.[1] Whether that trillion dollars has been well spent, and conversely, whether the people of Queens would be better off if they lived more like other Americans, seem to us sufficiently important questions that household composition should not be considered exogenous.

In this paper, then, we begin to explore how subsidies and regulations affect decisions about household composition, and in particular about how many adults live in a household. Like the other papers in this volume, we focus on the case of New York City.

We start with descriptive statistics about households in New York City and in the nation. The size of the average household in the United States has shrunk dramatically over the last several decades. We show the ways in which New York households differ from national averages, and how households in the different boroughs differ from each other. The key conclusion is that average household composition varies greatly over time as well as space. There is plenty of variation that needs explaining.

In the second section, we describe some of the major public policies that might affect household size and composition, both directly and indirectly. We demonstrate that a wide variety of government policies take aim, intentionally or not, at living arrangements. The third section considers the determinants of household size and composition more generally and generates some testable hypotheses about how different policies might shape living arrangements.

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[1] In 2000, total residential fixed assets in the U.S. amounted to $10.7 trillion (U.S. Bureau of Economic Analysis, 2001).

Section 4 is the empirical heart of the paper. Drawing on data from the Social Indicators Survey for New York City, we use Poisson regressions to learn what determines household size, testing the predictions from section 3. The results are striking. Housing and social policies have effects on household size that are both statistically and economically significant. This result holds when we use two different measures of household size -- the number of adults and the number of adults other than the head of household's partner. Food stamp receipt, section 8 participation, and public housing tenancy all make households smaller; public assistance receipt may also do so. (Collinearity makes it difficult to parcel out independent effects of these programs.) To give one example, we find that the typical household receiving a Section 8 rental subsidy has 9 percent fewer adults than comparable households who do not receive such a subsidy. Just as surprising as the strong confirmation of economic theory in these regressions is the weak role that race, culture, and ethnicity play, once income and program participation are controlled for. These variables are rarely significant.

Finally, we turn from positive analysis to normative. We ask why we do not all live alone, why we do not congregate in one enormous commune, and what sorts of market failures might keep household sizes from being optimal. Implicit in many of the social policies that are described below, for instance, is the idea that people left to their own devices will sort themselves into households sub-optimally. We review the literature to see what evidence there is that larger households impose costs. We find no reason for thinking that New York City households would be systematically too big or too small in the absence of housing policies and social programs that aim (consciously or not) at changing their size.

1. How New Yorkers Live

        The first two columns of table 1 compare the composition of the average household in

2000 in New York City with that in the United States as a whole. While there is little difference

between the total numbers of people living in the average New York City household and the

average household in the United States, the mix of people differs greatly. Households in New

York City contain many more adults and many fewer children. Moreover, the adults living in

New York's households are typically not spouses or partners, but more typically adult sons and

daughters, more distant relatives, and non-relatives. Consider that New York City households

contain an average of 0.54 adults who are neither a spouse nor partner of the householder; in the

United States as a whole, households include an average of only 0.36 such adults. (These are not

trivial numbers: the U.S. had 105.5 million households in 2000, and 0.36 adults per household

means over 36 million people.) Similarly, New York households have more kids who are not

children of the householder and fewer kids who are. Put simply, New York households have

more of the people who might live elsewhere and fewer of the people who have traditionally

lived together.

        TABLE 1 AROUND HERE

        Table 1 also contrasts the borough with the smallest households, Manhattan, and the

borough with the largest, Queens. Manhattan households are far smaller than the national

average; Queens households far larger. But even Queens households have fewer spouses and

own children of the householder than the national average, and even Manhattan households have

more non-relative adults and unmarried partners than the national average.

        Table 2 compares New York City with the remainder of the Consolidated Metropolitan

3

Area. The contrast is very similar to the contrast with national averages. Households in the suburbs have more spouses and minor children of the householder but fewer others. Suburban New York households include an average of 0.44 adults who are neither spouse nor partner of the householder--about halfway between the City and U.S. averages.

TABLE 2 AROUND HERE

A quick look at households in other large cities demonstrates that New York City is not an extraordinary outlier among big cities. Table 3 shows that households in seven of these cities are actually larger than those in New York City and three contain more adults who are neither a partner nor a spouse of householder. In Los Angeles, the typical household is in fact larger than that in Queens (though it has fewer adults). New York appears to look the most like Los Angeles, Chicago, and Detroit. The other cities have large households too - but much of their large size is accounted for by the presence of children, partners, or spouses of the householder.

Certainly, New York City's households are not large compared to the other large central cities within the New York metropolitan area. Households in New York City are actually *smaller* on average than households in any of the six other cities with over 100,000 people, and they have fewer adults who are not spouses or partners of the householder than households in four of these other cities.

TABLE 3 AROUND HERE

Table 4 shows how household size and composition changed between 1990 and 2000. Average household size grew in New York, but fell in the rest of the nation.[2] Even Manhattan

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[2]There is some reason to believe that the growth in household size in New York City may

4

households got a little bit bigger, while the growth in Queens was considerable -- the typical

Queens household went from 2.68 people to 2.81 people. Among adults, the pattern of change in

household composition looks pretty similar across areas: fewer spouses and adult children, more

of everything else. The number of children of both kinds grew in New York, but fell in the

nation.

TABLE 4 AROUND HERE

Table 5 provides a longer, national time series on household size. Between 1940 and

2000, average household size in the U.S. fell by 29 percent, and the number of adults per

household fell by 24 percent. The trend is monotonic. One might presume that this trend is due

to the aging of the population -- that is, the population is getting older and older people are more

likely to live alone.[3] But such aging in fact accounts for only a small share of the increase.[4] The

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have been even greater than Table 2 indicates. The 2000 Census records a gain between 1990-
2000 of approximately 200,000 households, while city records only indicate that only about
80,000 new housing units were built over the decade. Many observers attribute this discrepancy
to a reduction in the undercount. If small households were more likely to be overlooked in 1990
(smaller things being more difficult to find), and less likely to be undercounted in 2000, then the
actual growth in New York City households size was considerably larger than that shown in
Table 2.

[3]While older individuals may also be more likely to live in two-person households, the
increase in households made up of two people over this time period was far more modest than
the gain in single person households. Between 1960 and 2000, the proportion of two-person
households rose by 19 percent, in comparison to the 95 percent gain in the proportion of one-
person households.

[4]Consider the share of households with only one person - which swelled from 13.1
percent of the population in 1960 to 25.8 percent in 2000. To test how much of this increase was
due to an increase in the proportion of older households, we estimated the percent of single-
person households that would have existed in 2000 had the proportion of households with
individuals 65 and over been the same in that year as it was in 1960. Had this proportion
remained steady, we estimate that the share of households living alone in 2000 would have been
24.8 percent - only slightly smaller than the actual percentage.

actual likelihood of living in smaller households, controlling for age, seems to have increased over these decades.

TABLE 5 AROUND HERE

How significant are these time series and cross-sectional contrasts? The introduction pointed out that if all Americans shared housing the way people in Queens do, we could manage without several large states or about a trillion dollars worth of investment. Another way to underscore the social and economic significance of these differences is to point out that with far smaller increases in size, U.S. households could easily absorb the homeless population. In fact, if existing households took in the full population of homeless people in the U.S., average household size would probably increase by less than 0.01 persons (from 2.59, say, to 2.60).

In short, these tables show tremendous and significant variation in household size and composition over time and space. Even within a single city, we see large contrasts. In the next sections, we explore the extent to which public policies, and housing policies in particular, might contribute to this variation.

2. Public Policies Affecting Household Size and Composition

Official concern about appropriate living arrangements is legislated into numerous laws and regulations in the United States. Many of our social policies, as well as many provisions in our tax code, favor certain arrangements over others. This section outlines many of the ways that social policies and tax policies give preference to different households and reviews the evidence on their influence on actual behavior. We then consider the ways in which housing policy might shape household size.

6

Food Stamps

The food stamp program is one of the mainstays of New York City's welfare state. Among means-tested programs only medical insurance and school lunches have more recipients, and the food stamp program spends considerably more money than school lunches (refer to Irv paper). The program has several provisions that discourage large households.

The maximum monthly allotment is not proportional to household size; instead, additional household members raise the monthly allotment by decreasing amounts. Income eligibility limits follow the same pattern: if two people whose income makes them each eligible individually form a household, that household's income may be above the guidelines for a family of two. Households with more than $2,000 in assets are also ineligible--no matter how big the household is. The food stamp benefit that a household actually receives is the difference between the maximum monthly allotment and 30 percent of the amount the household has available to spend on food. The calculation of how much is available to spend on food disadvantages larger households in three ways: first, because every household receives the same standard deduction from its income regardless of size; second, because the deduction for child care is capped at the same amount regardless of the number of children in the household; and third, because households that pay more than half of their net income on rent get to deduct this added amount from the total available to buy food.

The interaction between all these provisions can be very powerful, especially among low-wage earners in a high-rent city like New York. Consider two individuals, each earning $550 a month and paying $300 a month for a room. Living alone, they would each receive

$74.30 a month in food stamp benefits (using fiscal year 1998 parameters). If they moved in together and shared an apartment with $500 a month rent, the food stamp benefit for the combined household would amount to only $38.30. Together they would lose $110.30 a month in food stamps--more than they saved in rent.[5]

These strong incentives in favor of small households are somewhat mitigated by regulations that allow some individuals who live together to be treated as two separate households for food stamp purposes. A brother and sister who live together, for instance, can be treated as two separate households for food stamp purposes, provided that they purchase and prepare food separately. The same is true for two unrelated individuals. But the opportunity for people living together to be counted separately is limited. Boarders cannot qualify separately. Husbands and wives, parents and children under 21, and minors under 18 living with persons exercising parental authority are all barred from separate application. These are some of the most popular ways of forming households. Households that want to save time and money by buying and preparing meals together, or who value the experience of shared meals, are also barred from the separate application option, no matter how they are related.

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[5]To give another example, consider two parent-child households, each earning $900 a month and paying $500 a month in rent and $150 a month in child care (the child being more than two years old). Each household on its own would get $177.80 a month in food stamps. But together with a rent of $700 a month and $250 in child care expenses, they would get only $109.20. Joining together would cost them $246.40 in food stamp benefits.

Public Assistance

The link between welfare assistance and living arrangements has long been debated, with many charging that welfare assistance, especially in its former incarnation - Aid to Families with Dependent Children (AFDC) - encourages people to remain single and have children out of wedlock (Murray 1984). Under AFDC, two-parent families could receive limited or no benefits and women with more children were awarded larger allowances than those with fewer children.[6]

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[6]In the past, some states cut two-parent families from the welfare rolls if one parent worked more than 100 hours per month, regardless of income or needs.   Many also required one parent in a two-parent family to have a work history in order to qualify for benefits.

While the evidence about influences on actual behavior is mixed (see Moffit 1998), living arrangements were certainly a key objective of the 1996 Personal Responsibility and Work Opportunity Act (PRWORA). Among the stated purposes of the act was to promote ... marriage, to encourage the formation and maintenance of two-parent families, and to provide assistance to needy families so that children may be cared for in their own homes or in the homes of relatives. Certainly, many provisions aimed directly to discourage pre-marital childbearing - the law, for instance, permitted states to enact family caps which freeze benefit levels and provide no additional funds if a woman has another child while receiving welfare.[7]

But if the welfare reform law aimed to decrease the number of children living in poor households, it has generally favored an increase in the number of parents and other adults. Most directly, it has allowed states to relax restrictions on two-parent families (Acs and Nelson 2001). In addition, the time limits, work requirements, family caps, stepped-up child support enforcement introduced -- or permitted -- through the welfare reform law make single-parent households less attractive.

The promotion of two-parent families (and marriage) is also a central goal of the Bush Administration's proposal to reauthorize the 1996 legislation. Under the Bush plan, states must, as part of their state plan, describe their efforts to promote healthy marriages as part of their state

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[7]Evidence on effectiveness of caps is mixed - Camasso et al. (1998) find that the family cap led to reduced births among welfare recipients in New Jersey, but Turturro, Benda, and Turney (1997) find no effects in Arkansas. Two studies using national data on individuals suggest that family caps have little effect on fertility (Acs 1996; Fairlie and London 1997).

plan and to provide   equitable treatment of two-parent, married families   (White House 2002).

What has welfare reform meant in New York? On the one hand, the state has relaxed restrictions on two-parent families applying for welfare (Acs and Nelson 2002). In other respects, New York's public assistance programs still appear to favor small households. The two major public assistance programs in New York are the Family Assistance Program (FAP--the New York name for Temporary Assistance to Needy Families) and Safety Net Assistance (the New York name for general assistance). The maximum benefit per capita (including shelter allowance) decreases sharply as household size increases. Per capita maximum public assistance benefits for a family of four are 44 percent of per capita maximum benefits for a family of one (HRA Facts, 2002). The comparable figure for food stamps is 84%. The asset limit and the earnings disregard for public assistance are also independent of household size, as with food stamps, so that they are less beneficial to households with more adults.[8]

New York public assistance programs also discourage recipients from living with wealthier step-parents or grandparents. Any income these individuals have over $442 a month is "deemed" to be available to the recipients, and their grant is reduced accordingly (Urban

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[8]Part of the New York public assistance grant is a shelter allowance equal to actual rent, up to a maximum. If the cap were not binding, this would strongly discourage larger households, since economizing on rent is one of the more important reasons to form a larger household. But the caps are usually not binding (74.3 percent of public assistance households received the maximum shelter allowance in June 1999 [HRA Facts, 2002]), and so the shelter allowance cannot be considered a major incentive for smaller households.

Institute, 2002). On the other hand, FAP forbids 16-year-old and 17-year-old parents from forming their own households. Such minor parents must live with a parent or guardian of their own if they are to receive benefits. This provision in part offsets many of the other provisions in the public assistance programs.

Evidence about the impact of welfare reform on living arrangements is just emerging. Acs and Nelson (2001) find that during the late 1990s (i.e., post welfare reform), the share of families composed of a single mother with children declined and the share of families made up of couples with children increased. They find further that these changes were greater for low-income and less educated families   the families, that is, most likely to be affected by welfare reform. This provides some support for the idea that the welfare reform law has contributed to larger numbers of adults per household, though the expansion of the Earned Income Tax Credit may have played a role too (see below). In a subsequent paper, the authors find further evidence that certain provisions of the welfare reform law -- family cap policies and more aggressive collection of child support -- are correlated with declines in single parenting and increases in two-parent households (Acs and Nelson 2002).

Bitler, Gelbach, and Hoynes (2002) also find evidence that welfare reform has had an effect on living arrangements among some subgroups. Among Hispanic children and black children living in central cities, for instance, their results suggest that reform has led to a decrease in the proportion living with an unmarried parent. But effects vary widely across subgroups and across states, so it is difficult to draw any links between specific policies and particular outcomes. In summary, public assistance may still encourage smaller households, but these studies suggest that these incentives are less powerful than before.

12

Supplemental security income

Although it is talked about far less, Supplemental Security Income for the aged, blind, and disabled (SSI) is actually a larger program in New York City than traditional public assistance (see Irv's paper). This program also encourages smaller households. The incentives come partly from the structure of benefit payments. As is the case with food stamps, payment per person is less for larger households of eligible individuals. The incentive extends to households where recipients are living with ineligible individuals, too. When this happens, SSI "deems" part of the ineligible person's income to be available to the recipient, and reduces the recipient's benefits accordingly.

Child Protection

Foster care is another example of a social policy that likely favors smaller households. In order to provide care for foster children, households must meet licensing requirements in their state. Standards vary, but applicants in all states must demonstrate that they can provide a safe living environment and adequate bedroom space to accommodate the child (Connect for Kids). Applicants are required to disclose the names of all persons who will be living with the foster child and most states require a home inspection to assess the likely living arrangements (National Foster Parent Association, Inc.). In New York State, the home or apartment must have separate bedrooms for children of the opposite sex over four years of age, and no child above the age of three can sleep in the same room with an adult of the opposite sex (Neff 2001). These restrictions likely make it difficult for larger households to participate.

Tax Policy

The treatment of marriage and children has also been central in recent debates about tax

reform.[9] Since the Tax Reform Act of 1969, which established a separate tax schedule for single

persons, critics have charged that the tax code penalizes married couples, who through filing

jointly, face higher marginal tax rates.[10] Republicans in Congress have recently proposed

several bills to address this marriage "penalty." In reality, the story is more complicated because

many couples may receive a bonus from marriage, depending in large part on the couple's

relative earnings (CBO 1997). It is possible that the winners outnumber the losers. Alm and

Whittington (1996) demonstrate that while the magnitude of the marriage tax is highly sensitive

to the method of calculation, the different measures all suggest a rise in the penalty in recent

years.

As for actual effects on behavior, James Alm and Leslie Whittington have written several

papers on the topic and find consistent evidence that taxes influence both the timing of marriage

as well as the marriage (and divorce) decision itself (Alm and Whittington 1995; Alm and

Whittington 1997; Alm and Whittington 1999). In their most recent paper, they estimate that

for women, the elasticity of the probability of marriage with respect to the marriage penalty (the

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[9]For a comparative perspective, see Pechman and Engelhardt (1990), who offer a review of the tax treatment of the family in 11 industrialized countries.

[10]The tax code also arguably encourages fertility. First, the federal government provides an exemption for dependents, which effectively lowers the cost of having a child. Whittington, Alm, and Peters (1990) find a positive and significant relationship between the tax value of the exemption and the national birth rate. Their estimates of elasticity range from 0.127 to 0.248. A ten percent increase in the value of the exemption, in other words, would raise the current fertility rate by between 1.3 and 2.5 percent - or add more than 50,000 new births. Second, the government also provides tax credits for families with children, which were recently increased in the Tax Relief Act of 2001. Third, the federal government allows working parents to pay for child care and dependent care expenses without taxes being withheld.

increase in tax liability a woman faces when she marries) is -0.23.[11]   If the marriage penalty for

women were to increase by 10 percent, that is, this would decrease the probability of marriage

for the average woman by 2.3 percent.

Earned Income Tax Credit

During the Clinton Administration, the Earned Income Tax Credit (EITC) was expanded

dramatically. Like the income tax, the program's treatment of marriage is complex. In general,

the EITC provides a strong marriage bonus for single, non-working parents and a large marriage

penalty for single parents who are working. Ellwood (2000) finds that the majority of families

face penalties. Yet, he finds little evidence that these incentives have had much of an effect on

marriage. He finds modest evidence that they have encouraged cohabitation, at least among

older women.

Housing Policy

Living arrangements are perhaps most central to U.S. housing policies and practices.

From at least the time of Jacob Riis and other Progressive Era reformers, policy makers in this

country have had a concern in this country about the crowded living conditions of the poor. Riis

and his fellow reformers worried that overcrowded housing bred disease and ill morals. In their

eyes, bad housing made bad people. Riis described overcrowded tenements, as the   day-to-day

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[11]Marriage tax/subsidy can differ for women and men. On average, it is larger for
women because they typically have lower earnings.

nurseries of crime and of the vices and disorderly courses which lead to crime   (Riis YEAR).

Such beliefs were embodied in the first tenement law of 1901, which legislated that every adult and child be allotted a minimum amount of space. Specifically, the act provided that each adult have 400 cubic feet of air and each child under 12 have 200 cubic feet of air. According to reformer Lawrence Veiller, this   privacy   provision was written to discourage the   practice of tenants taking lodgers and boarders into their apartments   (Friedman 1968, p. 35).

New York City's housing code continues to stipulate such restrictions. Today, the city's housing code requires that each adult living in rental housing have at least 80 square feet of living space (hallways and bathrooms are not counted in floor space).   In addition, the code prohibits families from renting rooms to more than two   boarders, roomers, or lodgers.

Subsidized housing programs are even more restrictive, both in New York and around the country. The guidelines typically target persons per room - but given the distribution of available units, they effectively constrain household size. To get into public housing or to obtain a Section 8 voucher to help with rent payments, for instance, an applicant must provide a list of all persons who would be living in the housing unit, their sex, date of birth, and relationship to the family head. In the case of public housing, the housing authority will then put the applicant on the waiting list and notify her if an apartment becomes available that the housing authority deems to be sufficiently large to comfortably accommodate her family. In the case of Section 8 housing, applicants are notified when an apartment becomes available, but they are required to rent an apartment that the housing authority deems large enough for the family.

Table 6 summarizes the occupancy standards employed by the New York City Housing Authority (NYCHA). As noted, the guidelines embody certain assumptions about social

16

acceptability, gender mixing, etc. Strictly applied, they suggest that no more than two people may share a bedroom and that with the exception of partners, people of opposite gender may not share a bedroom. To give one example, a two-parent family with a son and a daughter cannot use a Section 8 voucher to move into a two-bedroom apartment.

The Department of Homeless Services in New York also has guidelines for acceptable living arrangements. When an applicant for emergency shelter reports that her family's previous residence was overcrowded, the agency is required to investigate this claim. The agency will then arrange for a visit to determine whether or not the location remains appropriate and available to the family (and therefore the family is ineligible for assistance and must stay in the housing unit).

The actual guidelines used are similar to those used by NYCHA, but they are somewhat less strict. For instance, that same two-parent family with a son and a daughter could rent a two-bedroom apartment if the children were under the age of 12 or if the living room had appropriate sleeping accommodations.   The agency also finds it acceptable for as many as four children to share a room, as long as every child has a bed and the entrance to the room is unobstructed. Unacceptable features include shared sleeping rooms by children of different sexes over the age of 12; shared sleeping rooms by unrelated adults of different sexes, excluding those involved in an ongoing partner relationship; shared beds by a greater number of persons than intended for normal use; shared beds by unrelated adults, excluding those involved in an ongoing partner relationship (New York City Dept of Homeless Services 2002)

3. Determinants of Household Size

In this section we consider the determinants of household size, with a particular focus on the role of housing policy. We concentrate on the number of adults per household. The central question is as follows: Given a fixed number of adults, how do they sort themselves into different households? We are developing a detailed way of answering this question in another paper and will present a summary of the analysis here.

The model in that paper omits from consideration two important classes of people: children and potential immigrants (both into New York City and out of it). We leave direct consideration of children out of the model for two chief reasons. First, children cannot form households on their own; the decision to invite more children into one's household or to bring them in does not therefore directly affect the total number of households or the number of required housing units in turn. The policy implications are thus quite distinct. Second, children are rarely permitted to make decisions for themselves about which households they will join. We abstract from migration considerations in the other paper merely to simplify notation. Thinking about migration is an easy extension.

Rent levels are one consideration in sharing decisions. Because of economies of scale in housing, it is cheaper to share housing than it is to live alone. And when rents are higher, the advantage of sharing is greater. Thus, we expect to see a greater proportion of sharers when rent levels are higher. More sharing, in turn, means less demand for housing stock. Sharing decisions thus produce a downward-sloping demand curve for housing units as a function of rent. Equating supply with demand produces both an equilibrium rent and an equilibrium average household size. When we think about policies, we will think about how they shift demand and supply curves, and how these shifts perturb the equilibrium.

Ceteris paribus, we expect adults with lower incomes and lesser wealth will be more likely to share housing. While they might wish for greater solitude, it comes at too great a price in terms of forgone consumption of other goods.

Holding rents constant, people also have different tastes for sharing housing, or rather different preferences for living alone. Tastes for sharing may be correlated with demographics. Most clearly, we expect that immigrant households should have a greater number of adults, because they face a higher price for housing in terms of forgone non-housing consumption. Certain ethnic groups may also be more apt to choose multi generational living arrangements and therefore live in households with a greater number of adults (Geronimus 1997).

People also have attributes that make them more or less attractive roommates to others. Consider the net effect that children have on the number of adults in a household. On the one hand, the presence of children may make an adult caregiver eager for helpers, and so be willing to sacrifice in other dimensions to bring other adult caregivers into the household, or to keep them there. On the other hand, some adults may find that a household with children in it affords them less peace, quiet, and solitude than an otherwise similar household without children, and therefore be less eager to join that household or to stay in it. Thus we do not have a strong prior belief on whether the presence of children increases the number of adults in a household or reduces it.

Various social policies also contribute to decisions about sharing housing, through lowering or raising the cost of caring for older dependents, living with a partner/roommate, or being married. Certain policies subsidize households to stay small. The food stamp, TANF, SSI, and section 8 programs are all good examples. The market effect of these programs

depends on how their beneficiaries would have behaved in the absence of the program. To the extent that people choose to live in smaller households than they would otherwise, these programs shift the demand curve for housing to the right. At any given rent, more housing units are demanded and households are smaller on average.

The elasticity of housing supply determines whether this demand shift translates into higher rents or a larger housing stock. Inelastic housing supply--the likely short-run response-- means higher equilibrium rents. These high rents mean that other sharers replace the would-be sharers who received government subsidies and average household size stays the same. Notice that this is inefficient: sharers who find sharing less distasteful are replaced by sharers who find it more distasteful.

In the longer run, housing supply is much more elastic and builders will create a larger equilibrium housing stock to accommodate the greater demand for housing units. This is also inefficient: the benefits that the subsidized small households gain from being small are less than the cost of constructing additional housing.

On the other hand, these programs do not move the demand curve for housing if they do not induce any households to be smaller than they would otherwise be. For instance, if section 8 vouchers go exclusively to people who would live in small households anyway, the vouchers are merely transfers to those households and have no further implications in the housing market. One of the goals of the empirical research, therefore, will be to try to gauge the extent to which food stamps, public assistance, and section 8 make recipients act differently.

The analysis of public housing is similar. Only 26 percent of the apartments in New York City's public housing developments have more than two bedrooms and only four percent

include more than three bedrooms (NYCHA documents). The guidelines in table 6 thus severely

reduce the eligibility of large households. Ex post doubling up is also strongly discouraged. The

effect on the demand curve is just the same as the effect of section 8 and food stamps: to the

extent that public housing induces some households to be smaller than they would be otherwise,

it shifts the demand curve out.

Public housing differs from those programs, however, because it also affects the supply

curve: more units are available at any (private market) rental. If (private) housing is supplied

perfectly elastically, this makes little difference: public housing crowds out private, equilibrium

rents don't change, but the final housing stock is bigger because demand has shifted out. With a

less elastic supply curve, part of the supply effect of public housing is translated into lower rents-

-more precisely, rents lower than the demand shift by itself would have caused. Since with

inelastic supply the demand increase raises rents, the overall effect on rents--and hence on

sharing by people who are not admitted to public housing--is ambiguous. Empirically, then, it is

important to find the extent to which admission to public housing affects household size, since

the shift in the housing demand curve is a key variable.

Two other parts of the New York City welfare state also shift the housing demand curve

out, but do so indirectly. These are rent control and Jiggetts relief. Jiggetts relief grew out of a

1997 lawsuit in which a state judge found that New York's shelter allowance (the part of the

welfare grant set aside for rent) was so low that families living on public assistance could not

afford to live in New York City. Until the State implements a shelter allowance that is adequate

in New York City, the judge ordered that the state pay for part or all of the ongoing rent for

families on public assistance who are at risk of eviction for not paying their rent (Community

Service Society 2002).

These programs operate primarily through an income effect. Their recipients have greater income after paying their rent, and so may be expected to acquire more of every normal good, including the peace, serenity, and security attendant to small household size. Rent control adds a further constraint against moving, since a household that moves loses the low rents that rent control produces. Often, joining a larger household entails moving, since the larger household will use more space or because the household one is joining stays put, and the constraint against moving may also discourage rent-controlled households from growing in size. Fear of being accused of violations that could result in loss of lease may also discourage rent-controlled households from taking in boarders, friends, or relatives.

To the extent that these considerations lead Jiggetts recipients and rent-controlled tenants to live in smaller households than they would otherwise, the demand curve for housing units shifts out. All the market effects of section 8 and food stamps follow. So we will also try to gauge the effect on household size of Jiggetts and rent control.

The other major housing program in New York City are the series of measures that lower the cost of homeownership, particularly the ownership of detached single family homes. Homeowners (regardless of physical structure) in the U.S. receive favored federal tax treatment and therefore face effectively lower housing prices. Moreover, in New York City, the property tax burden on 1-3 family homes (class one properties) is far lower than that for larger residential buildings (class two). The key is the assessment ratio. Properties in New York City are not assessed at their full market value, but only at some proportion of that market value. The assessment ratio applied to the fair market value of a class one property is currently just 8

22

percent, while that applied to larger buildings is 45 percent (City of New York 2002, p. 42).

There are also caps on the rate of growth of assessments for class one properties and smaller

class two properties. Increases in assessments for class one properties are limited to six percent

per year and 20 percent over five years. For class two properties of under 11 units, annual

assessments are restricted to eight percent per year and 30 percent over five years. For larger

class two properties, there are no restrictions on assessment increases (City of New York 2002,

p. 42).

The effects of these programs are more difficult to analyze. We think of these programs

as supply side programs--the subsidy is attached to the housing unit, not to the persons

occupying it. Since owner-occupied and single-family houses are generally larger than other

kinds of housing units,[12] the subsidy in our model (developed in more detail in the other paper) is

attached to physically larger rather than smaller housing units.

It is most convenient to think about the implications of such a subsidy in a world with

two markets--big houses and small houses. The subsidy to big houses reduces the price in that

market (except in the highly unlikely case of totally inelastic supply), which induces some

households already living in big houses to get smaller, and some people originally living in small

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[12]In 1999, the average single-family home in New York City was 1,581 square feet; the average apartment in rental buildings with more than 3 units was just 893 square feet. (Source: author s calculations from New York City s RPAD file, an administrative data set gathered for the purpose of assessing property taxes. Note that mixed use properties are excluded and mean square footage in multifamily buildings includes common space.)

23

houses to shift to big. This shift of people from small houses to big moves the demand curve for small houses down, which reduces the equilibrium price of small houses. Households originally living in small houses get smaller, too.

The overall effect of the subsidy on household size is ambiguous, however. There are three kinds of people: those who live in small houses regardless of subsidy, those who live in large houses regardless of subsidy, and those whom the subsidy induces to move from small houses to large. Among the first two groups, the subsidy causes household size to fall, since it cuts the price of housing for them. Among the third group, however, household size is unlikely to fall for anyone and it may rise for some. This rise in average household size among switchers from small to large houses may or may not be large enough to offset the decline in the first two groups.

The regressions that we present in the next section show that homeownership, particularly ownership of a single-family home, is associated with larger household size. But this association does not necessarily imply that encouraging homeownership encourages larger households.

4. Empirical Tests of Household Size

As noted above, the empirical analysis in this paper is focused on New York City. Using a pooled sample of households from the 1997 and 1999 Social Indicators Survey, we undertake a cross-sectional analysis of household size. It is worth underscoring here that with cross-sectional data in a single city, we are limited in our ability to identify causal relationships. Moreover, we cannot test how the introduction of subsidies in a market is likely to alter

24

equilibrium household size. However, we can test a number of hypotheses outlined above - most notably, we can see the extent to which receipt of housing subsidies and participation in income transfer programs is correlated with smaller households.

We focus on two dependent variables: number of adults per household; and number of adults in the household, other than the spouse or partner of respondent. We consider these variables separately because the decision to take on a roommate may be influenced by somewhat different considerations than the decision to get married or to live with a partner. Characteristics that make someone a highly attractive spouse may not be as relevant to a roommate, and while many have a preference for sharing housing with a partner or a spouse, fewer actually prefer having a roommate. For example, while higher incomes and receipt of subsidies might lead to fewer non-spousal adults in households, such factors may not affect the presence of a partner or spouse.

Table 7 presents descriptive statistics for the variables used in our analysis. We include four categories of independent variables. The first set of variables are demographic, since, as noted above, tastes for sharing may also be correlated with demographics. This includes race, nativity, and number of children. As shown, the sample is about 60 percent minority and 38 percent foreign-born. The second category covers socioeconomic status - here we consider average income per adult in the household (averaged over respondent, his or her partner/spouse if present, and any other adults for whom income is reported) and average asset levels - again averaged over adults for whom assets are reported.

The variables most central to the analysis are the dummy variables that indicate participation in various types of income and housing subsidy programs. As shown, ten percent

of households receive public assistance, 13.7 percent receive food stamps, and 4.3 percent receive SSI. As for housing assistance, approximately one quarter of survey households live in rent controlled apartments, while another 14 percent either live in public housing or receive Section 8 vouchers to subsidize their rent. We also consider whether a household owns their housing unit and whether the household lives in a house (i.e., 1-3 family home) as opposed to an apartment. As noted, homeowners and residents of smaller buildings receive favored tax treatment in New York City. Roughly one third of households live in 1-3 family homes and 30 percent own their homes.

Finally, when considering the number of adults other than a spouse or a partner in the household, we also include a variable indicating the presence of a partner or spouse. This allows us to test whether these other adults serve as substitutes in part for spouses or partners. (Moreover, many of our independent variables are correlated with the presence of partner or spouse -- i.e., children, subsidies, homeownership.) Just over half of respondents have a partner or spouse living with them.

TABLE 7 AROUND HERE

Before moving onto regressions, Table 8 shows the mean number of adults and non-spousal adults for a number of different household types. The first thing to notice about table 8 is that not one of these differences is statistically significant at conventional levels. The contrasts, therefore, are meant only to be suggestive. In the first column, we look at the total number of adults per household. Looking at the demographic variables, the major differences seem to be between immigrants and non-immigrants (or between the ethnic groups who have been in New York City longer and those heavily represented among more recent arrivals).

26

Immigrant households have more adults, and assisted housing households have fewer.

Households with children tend to have a greater total number of adults, although not more adults who are neither parents nor partners/spouses of parents. As for income, households with average incomes (averaged over adults) above the sample median tend to have fewer adults.

TABLE 8 AROUND HERE

Participation in transfer programs appears to make some difference. Households that received some welfare payments or food stamps in the last year are smaller than those who did not. Finally - housing appears to matter too. Rent controlled households have somewhat fewer adults, and housing subsidies appear to make an even larger difference, with assisted households having fewer adults. There also appears to be a difference between homeowners and renters. Households that own their homes have more adults, and those who live in houses (as opposed to multifamily apartments) appear to have more still. Finally, the presence of a partner or spouse in the household is linked to a greater total number of adults in a household, but to a smaller number of   other   adults.

We have used Poisson regressions on pooled 1997 and 1999 SIS data to test some of the predictions from section 3.[13] The first set of regressions, shown in Table 9, models the number of adults in a household other than the respondent. We show results with and without assets included, since the sample size falls when this variable is included. We also show results with and without   homeownership   and   house   variables, since the regressions answer somewhat different questions. Consider the coefficient on rent control. With the ownership variable

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[13]As a test, we also estimated these regressions using OLS, and the results were qualitatively the same.

27

included, this coefficient shows the extent to which households living in rent-controlled apartments are smaller than other renter households. This is a valuable question, but it effectively assumes that ownership decision was already made at some point in the past. In fact, ownership decision may be jointly determined with rent control (decision to own is affected by availability of rent-controlled apartment), and thus it may be more appropriate to ask whether households in rent-controlled apartments are smaller than all households.

The second set of regressions, shown in Table 10, models the number of adults other than the respondent and his/her partner or spouse and include most of the same independent variable. (The one difference is the inclusion in models 2-5 of a variable indicating the presence of a partner or spouse.)

Starting with table 9, it is worth pointing out that none of the coefficients on the race and nativity variables is statistically significant in any of the regressions. What appears to matter instead (other than the presence of children, which is consistently linked to larger numbers of adults), are the economic variables. Income and wealth, for instance, are clearly linked to the number of adults. The relationship between income and the total number of adults is curvilinear. The number of adults declines with income, but less sharply as income rises. When we add in asset levels (model 2), we see that higher asset levels are linked to fewer adults.

TABLE 9 AROUND HERE

Subsidies matter too, and in the direction we predicted. Certainly, receipt of food stamps is strongly linked to fewer adults.[14] The coefficients on SSI and public assistance are

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[14]This is not simply an income effect. When we add food stamps income into total income calculations, the coefficient on food stamps remains almost as large and highly significant.

insignificant, but this is partly due to their high correlation with food stamps, which makes it impossible to identify independent effects for all three variables. Most people who participate in these transfer programs also get food stamps. (The correlation between receipt of food stamps and public assistance, for instance, is 0.75.) When we drop food stamps from the regressions, the coefficient on public assistance becomes consistently negative and significant and the coefficient on SSI becomes consistently negative and sometimes significant.

Housing subsidies also appear to make households smaller. As expected, receipt of Section 8 subsidies is also linked to fewer adults, and the results suggest that households living in rent controlled apartments are smaller too, at least until the last model, when the house variable is included in the regression. It may be that rent control is masking an apartment effect, but it may also be that the high correlations among these variables make it impossible to identify independent effects. The coefficient on Jiggetts is not significant, but this may be due to the very small number of households in our sample who report receiving assistance through Jiggetts.

The results also suggest that households living in public housing have fewer adults, ceteris paribus, while homeowners and households living in a house, as opposed to an apartment, tend to have more adults. As discussed, one cannot draw causal inferences about the effects of ownership and single-family homes, however, since owner-occupied units and units in houses are in fact larger on average than rental units and those in apartment buildings.

The magnitude of these effects are quite large. Consider the average household receiving a Section 8 rental subsidy; its expected number of adults falls from 1.90 to 1.72 when the household receives a rent voucher. For the typical household receiving food stamps, its expected number of adults falls by 18 percent, from 2.1 to 1.73, when the household receives food stamps.

29

These probabilities translate into a significant shift in housing demand. Our estimates suggest that the 393 households in our sample receiving food stamps would occupy 70 fewer housing units in the absence of the food stamp program. The 210 households receiving Section 8 would demand 20 fewer housing units in the absence of Section 8 subsidies.[15]

When we consider the determinants of the number of adults, other than the respondent and partner (table 10), we see that the coefficients on some of the race and nativity variables are statistically significant in the first two models. Until we control for household assets, the coefficients on black, Hispanic, and foreign-born are positive and statistically significant. Once we control for assets, however, these coefficients no longer emerge significant, suggesting that differences in asset levels may explain the apparent racial differences.

The effects of income and assets are largely the same here - higher incomes and wealth are linked to fewer adults (though again in the case of income, the effect is predicted to diminish and ultimately reverse as incomes rise). The presence of children does not appear to matter here, at least once the presence of a partner or spouse is taken into account. Finally, the effects of

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[15]To arrive at these estimates (using the example of Section 8), we first calculated (for the average household receiving a Section 8 subsidy) the expected number of adults with and without the rental subsidy. We then multiplied this difference by the total number of households in the sample receiving Section 8 to get an estimate of the total number of people who have to find housing units as a result of Section 8. We then divided this number of people by expected household size without section 8 for a rough estimate of how much Section 8 shifts the demand curve for housing.

subsidies are largely the same - subsidies (in particular, food stamps, section 8, rent control, and public housing) are linked to fewer other adults. And once again, homeownership and living in a house are positively associated with a greater number of   other   adults.

The presence of a partner or spouse is strongly associated with a smaller number of other   adults. If you live with a partner or a spouse, you are far less likely to live with another adult relative or unrelated adult. These other adults, in other words, appear to be substitutes to some extent, for partners or spouses.

5. <u>Normative analysis</u>

Are households in New York the right size? We have seen household size growing-- should we be happy about this, sad about it, or indifferent? Can different policies affect household size in ways that create potential Pareto improvements? In this section we will follow the positive analysis of the last several sections with the beginning of a normative analysis.

A. Why share housing?

Housing serves many purposes, and for many of those purposes, increasing returns to scale operate. Policies that reduce household size force people to forgo these increasing returns to scale; they make housing more expensive.

The most obvious source of increasing returns to scale comes in the use of houses as shelter--protecting residents and their possessions from weather and marauding animals, both human and non-human. The cost of shelter is basically the cost of building a box. The output of box-building is the number of cubic feet enclosed within the box, since this determines the

31

number of people who can take refuge within the box and use it to protect their possessions. Hence the (2/3)-rule from engineering applies: cost is proportional to output to the (2/3) power. Doubling the number of people a box or house can shelter increases the cost of building that box by roughly 59 percent.

This argument also applies to many consumer goods. Refrigerator construction obeys the (2/3)-rule; so do furnace and air conditioner construction. Closets, desks, and dressers are just boxes, too; so are pots, ovens, dishwashers, clothes washers and dryers, and microwaves.

Similar geometric considerations also point to increasing returns to scale in the connections households have to many utilities. Houses serve as the means for households to receive mail, electricity, water, cable TV, television, and broadband, and to dispose of sewage. Doubling the capacity of these connections generally requires far less than doubling the cost of construction. A water pipe, for instance, with a 41 percent greater diameter carries twice as much water per minute. A single antenna or satellite dish can serve two television sets.

Food, also, can be purchased more cheaply in bulk. Food packaging obeys the (2/3)-rule, and packaging costs represent a substantial portion of retail food prices. Some foods naturally occur in large sizes (or, because of the (2/3)-rule, are prepared in large batches), and larger households internalize the cost of splitting up these foods, and probably do it better than commercial entities.

Other economies of scale come from better scheduling. A second person in a heated or air-conditioned room imposes very little additional cost on the heating or ventilating system, and a room used continuously for two hours at 70 degrees Fahrenheit is not twice as expensive to heat or cool as the same room maintained at 70 degrees for one hour. Lazear and Michael (1980,

p. 92) point out some goods are public within a household: their consumption by one member does not diminish their availability to other members. Examples abound: electric light in a room, the beauty of art work on the wall, the security provided by a locked bolt on the door, etc.

Most people spend most of their time outside of their residences, and even when they are home, people are not always using the couch, the comfortable chair, the can-opener, the kitchen, the bed, the bathroom, and the computer simultaneously. Because of this down-time, doubling a household's size does not require doubling the household's stock of consumer durables in order to maintain the same standard of availability.

Scheduling also helps in food preparation. Unlike a supermarket, a household with several people in it does not have to worry about who will eat the second half of a can of soup. Food preparation is also less time-consuming: cooking a meal for three takes little more time than cooking a meal for one.

Household economies of scale come from specialization and assignment according to comparative advantage, too. The size of these economies within households is probably quite limited on average, however. Market production rather than household production is likely to dominate activities with great economies of specialization.

Finally, there are great advantages from living with other people, aside from any reduction in cost. Some things are just easier with more people. Moving a sofa any great distance by yourself is extremely difficult, but with two people it is very easy. Sharing a house provides insurance, both against income uncertainty and health uncertainty (it's nice to have someone around to take care of you when you are sick and to call the ambulance in an

emergency). For many people loneliness is a great psychological burden. People acquire

animal companions and lavish care upon them partially to offset loneliness, but non-human

animals are not perfect substitutes for humans (even if they never hog the shower when their

human companions want to use it). Some people derive great joy from the presence of a

particular other person.

The need for companions is particularly strong for children. Children can suffer greatly

in the absence of adult supervision. Children are likely better off when several adults are around

to help them out. McPherson and Stewart (1991), for instance, cite the advantages for child care

of having several adults in a household. Munroe and Munroe (1971) found that infants in more

crowded households were held more often and were responded to more quickly than infants in

less crowded households. This work was carried out in Kenya.

Most of these services, of course, could be performed for money by someone outside the

household who left when he or she was done performing them. By the same token, unused time

for a household's can-opener or sofa could be leased on the spot market. Transactions costs--not

the least of which is the transportation of an outsider to call the ambulance or use the can-

opener--are often a formidable barrier to such outside dealings, however.

B. Empirical evidence on economies of scale

Economies of scale in household operation have been the subject of extensive empirical

study, although most of this study has not used this term (exceptions are Lazear and Michael

[1980] and Nelson [1988]).

Economies of scale in household operation are more difficult to measure than economies

34

of scale in firm operation because the "output" of households is more difficult to conceptualize and to observe. Two different approaches have been taken to this problem. One approach has been to rely on expert opinion about what sorts of goods households of various sizes should have in order to achieve what the experts feel are decent ways of living. This approach is most frequently used by governments when they attempt to make regulations to treat households of different sizes similarly. We call this the "expert approach." The other approach, more favored by economists, is to use the indirect evidence of expenditure patterns to infer the levels of income needed to keep utility-maximizing households "just as well off" as their size changes. Many controversies have arisen among practitioners in this field about what "just as well off" means: whether it refers to desire-satisfaction, for instance, or some different measure of well-being; and whether the "household's well-being" refers to that of its head or to some social welfare function including the well-being of all members, including children. We call this the "economist approach." See Nelson (1993) for an illuminating discussion of these issues.

Studies also differ in whether they concentrate on just one aspect of household consumption, or on total expenditure. Among the studies that concentrate on single aspects, those on food and housing are most important.

For food, the U.S. Department of Agriculture (USDA) has calculated the cost of purchasing a "Thrifty Food Plan" for households of various sizes, and uses this as the basis for making payments under the Food Stamp program. This is an expert study. The idea is that if two households of different sizes both spend wisely the Thrifty Food plan amount for food, and share reasonably, members of both households will eat "equally well," and minimally adequately, as both of these terms are judged by USDA experts. Table 11 shows the per person

35

cost of the Thrifty Food Plan for households of different sizes, all expressed as a ratio to the cost for a one person household.

Table 11 also shows the results of an economist approach study to food expenditure, that of Nelson (1988), and shows what food expenditures would be if costs followed the (2/3)-rule. Both Nelson and the USDA results suggest definite economies of scale, with Nelson showing much larger economies. As household size increases, USDA per person costs fall more slowly than the (2/3)-rule, while Nelson's per person costs fall considerably faster.

TABLE 11 AROUND HERE

Since food accounts for about 12 percent of the expenditures of the average one-person household in 1999, moving in with another person and sharing food saves about 1 percent of total expenditure, using the USDA estimates (U. S. Bureau of the Census, 2001, table 660). Nelson's estimates would indicate a savings more than four times as large.

For housing, the U. S. Department of Housing and Urban Development (HUD) does not set similar standards directly, but determines fair market rentals (FMRs) for various kinds of apartments under the section 8 program, and local housing authorities decide the size of households that will be permitted in which apartments. Implicitly these two steps create a rental cost per person for households of different sizes. Table 12 shows these relative costs for New York City (and Rockland and Putnam counties) for fiscal year 2002. As noted, the New York City Housing Authority's (NYCHA) occupancy standards specify two different apartment sizes for some household sizes, depending on gender compositions (see table 6). Thus in table 12 we show different costs per person for some household sizes. We also present Nelson's housing estimates, and the (2/3) rule for comparison.

36

TABLE 12 AROUND HERE

Not surprisingly, economies of scale in housing are much greater than economies of scale in food. By every estimate, they are greater than the economies implied by the (2/3)-rule. The average one-person household devotes about 30 percent of its expenditures to shelter and utilities, and so doubling up saves about 11 percent of expenditure on the more conservative HUD-NYCHA estimate. It saves about twice as much on Nelson's estimate.

Finally, there have been many attempts to construct estimates of total expenditure. The best known of these is the Orshansky poverty scale, a product of the expert approach (for a discussion of the Orshansky scale and its history, see Nelson [1993]). More influential are the USDA eligibility standards for food stamps, also a product of the expert approach. Exactly what these standards measure is unclear, but is probably best thought of as the minimum expenditure needed to be well off enough not to merit government assistance, or the minimum expenditure required for basic needs. Table 13 shows the relative per person costs of achieving these levels of well-being. (The food stamp program uses two measures of income, net and gross, to establish eligibility, but relative per person costs are the same under both measures.) This table also includes the results of an economist approach study, that of Lazear and Michael (1980).

TABLE 13 AROUND HERE

The economies of scale on all three measures are considerably larger than those implied by the (2/3)-rule. Doubling up saves between a third and a half of income.

All of these studies, both the expert approach and the economist approach, leave out the non-pecuniary benefits of large households--companionship, child care and child development, insurance, assistance with day-to-day tasks and problems. In that sense, they greatly

underestimate the benefits some people derive from larger households. The most serious

weakness in these studies, however, is that they leave out the non-pecuniary costs of larger

households. Such costs must be considerable: otherwise no one would live in a small household.

 These costs will be the subject of the next sub-section.

Before discussing these non-pecuniary costs, however, it is important to note that the

economies of scale from household size seem to be captured mostly by the household itself.

There do not seem to be many large externalities, either positive or negative. That does not

mean that household decision making properly recognizes the gains that all member of the

household realize. While children are members of the household, they may be incapable of

recognizing what is in their best interest, or exerting much influence over household decision

makers.

Being internalized makes these economies of scale no less real and no less substantial.

Some transfer programs seem to be designed to offset them. Pendakur (1999, p. 2), for instance,

writes,   An accurate equivalence scale may allow decision makers to design transfer programs

that do not create incentives for program participants to change their household type to increase

their level of welfare.   Designing transfer programs so that participants have no incentives to

choose better household sizes seems no more sensible than designing programs so that

participants have no incentive to refrain from swallowing cleaner fluid or amputating their

fingers. Ceteris paribus, transfer programs should encourage participants to realize these

economies of scale, not try to make them indifferent.

C. Costs of larger households

There are many different non-pecuniary costs of added household size. Some of them can be mitigated by incurring additional costs--often by increasing the amount of space a household occupies--but some cannot. The story we are telling about households is similar to the traditional story urban economists tell about cities: they exist because of economies of scale, and they are limited in size because of congestion and externalities. Optimal size of each city and each household is determined by the outcome of a battle between scale economies and congestion diseconomies.

The best documented congestion diseconomies are health problems, particularly communicable diseases. Household economies of scale arise from having people in close contact with others in the household, sharing consumer goods, and using the same durable equipment. Germs and viruses spread quickly within households. The bigger the household, the greater the exposure each member of it has to diseases spread by other members.

Most of the medical evidence is about crowding rather than large household size per se. But crowding is quite correlated with large household size: in the SIS, if we use the conventional definition of crowding as more than one person per room, the correlation between crowding and household size is 0.47. The average crowded household has 5.09 people; the average uncrowded household, 2.97. Thus we can interpret much of the evidence about crowding as applying to large household size. The medical literature also concentrates on children rather than adults.

Children in crowded conditions are more susceptible to respiratory ailments (Mann et al., 1992), stomach illnesses (Galpin et al., 1992; Mendall and Northfield, 1995), and, among Australian Aborigines, cerebro-spinal diseases (Pierce et al., 1995). Children brought up in crowded conditions die younger (Coggon et al., 1993). There is also some evidence of greater

morbidity among adults (Mann et al., 1992; Mendall and Northfield, 1995).

Because it appears to arise primarily from crowding, the increased susceptibility to disease that larger households suffer from can alleviated in part by larger houses. The literature is unclear on this issue. But larger houses are expensive--just like other measures that reduce the risk of infection like vaccines and scrupulous cleanliness. Moreover, even the largest mansions allow personal contact among household members, such as sharing a common mailbox, doorknob, or kitchen. Thus part of the documented costs to health are undoubtedly due to household size per se, not just crowding.

Larger households also expose their members to greater risk of crime. The walls and doors of a house are one of the main forms of protection that people use against criminals, but they afford no defense against criminals within the household. In fact, a great deal of crime takes place within households. In 1999, 14.0 percent of violent crimes occurred in the victim's home--over 900,000 incidents in all (U. S. Department of Justice, 2002a, table 61). Moreover, 7.6 percent of violent crime victimizations (not including murder) were attributed to relatives of the victim (U. S. Department of Justice, 2002a, table 33).[16] About 600 children under five are murdered every year, most by their parents, and in 1999, 836 adults were killed by their spouses and 743 by boyfriends or girlfriends (U.S. Department of Justice, 2002b). Aside from violent crimes, many thefts occur within households, but no data are available.

Larger homes may partially reduce the dangers of intra-household crime by alleviating some of the pressures of interpersonal contact and by affording moderately good hiding places for valuables. Any such effect, though, is likely to be small.

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[16]We have not included former spouses as among relatives for this tabulation.

Large households also face the problem of being unable to reconcile the divergent desires of their members for goods that are public within the household. Basically, a household is going to have only one location, only one color house, only one type of stove or brand of washing machine, only one mode of celebrating the December holidays. To the extent that its members have divergent views on these matters, somebody will always be disappointed and sometimes everybody will be disappointed. This trade-off between variety and scale economies is well-known in industrial organization and in studies of fiscal federalism.

Sorting in household membership mitigates these difficulties, but it does not eliminate them. Households share many goods and attributes, and sorting on one of them is not likely to lead to agreement on all. A household with extremely compatible views about religion may include both cat-lovers and people allergic to cats, and a household of dog lovers may find itself in serious disagreement about smoking. Trust, moreover, is critical to household formation, and further constrains the degree of sorting that can occur. Even if two people agree completely about pets, religion, kitchen architecture, and the desirability of living near Route 22, they will not form a household if one thinks the other is likely to swindle her.

More rooms and more space allow more variety within a household on some matters, but not on all. A household can eliminate fights over what program to watch if it has enough rooms to house multiple television sets and enough money to buy them. Pets, perhaps, can be confined to certain parts of a large house, but stopping dogs from barking is not easy. On matters like location and architectural style, however, more rooms do not provide any added scope for variety.

Living in a large household, especially in a small house, also imposes a series of costs

from incessant human contact--loss of privacy, the stress of congestion, the annoyance of continual compromises, a feeling of loss of control. Early animal studies (for example, Dubos [1965]; Christian, Flyger and Davis [1960]; and Calhoun [1971]) suggested that crowding could have rather grave psychological and physiological consequences, and during the next two decades, social psychologists and sociologists studied extensively how crowding affects humans.

Many of these studies found virtually no effect of crowding. American naval personnel (Dean, Pugh, and Gunderson 1975), Peace Corps volunteers (MacDonald and Oden 1973), Hong Kong residents (Mitchell 1971), and children in !Kung communities (Draper 1974) have all been found to function excellently under conditions far more crowded than almost anything existing in New York today. While some other studies suggest crowding imposes costs, they used unsophisticated ecological correlation techniques that are not currently viewed as very convincing (see, for instance, Booth, Welch, and Johnson [1976] and the criticism by Higgins, Richards, and Swan [1976]).

This literature contains more positive, credible results for children and for college students than for adults. Shapiro (1974) found that nursery school boys from high density homes exhibited less fine and gross motor competence than boys from low density homes. This finding is consistent with laboratory observations that when children were placed in higher density environments, their body movements were inhibited and they played in more passive ways (McGrew 1972). Home density, however, made no difference to motor competence among nursery school girls.

Rodin (1976) found that crowded lower class children showed higher levels of learned helplessness and competed even when competition harmed them. Booth and Edwards (1976)

found that crowding increased sibling fights and physical punishment by parents, but had few other effects on family relations. Booth and Johnson (1975) showed that school authorities more often contacted the parents of children from high density households about school problems.

Crowding also seems to reduce cognitive abilities. College students who were forced to triple up in rooms designed for two students saw significant drops in grade point average relative to students in less crowded dorm rooms--and the drops disappeared when they returned to two-student rooms (Karlin, Rosen, and Epstein 1979). Numerous laboratory studies have shown that people perform complex tasks more poorly in crowded environments, but performance on simple tasks does not suffer (see, for instance, Nagar [1998] for results and a literature review).

For adults, the results are less strong. Only one pathology has been rigorously associated with residential crowding: increased rates of psychiatric hospitalization (Freedman, Heshka, and Levy 1975; Freedman 1975; Epstein 1981). In laboratories and in prisons, however, crowding can induce physiological reactions indicative of stress, like high blood pressure and palmar sweat, and so it may have other deleterious effects on health and general well-being (D'Atri 1975; Paulus, McCain, and Cox 1978; Cox. Paulus, McCain, and Schkade 1979).

Finally, large households impose costs on neighbors because they generate more noise, more foot and car traffic, and more school children. More infections within the household also imply more infections outside it. The noise externality can be mitigated by spending money on land and thick walls, although the large household has no incentive to do so, absent some form of compulsion. The other externalities are more difficult to mitigate with existing institutions. But for traffic and school children, concentrating attention on a particular neighborhood where a large household is located greatly overstates the size of these externalities. People in this

neighborhood would be better off if the large household were broken up and its members dispersed more widely, but people in other neighborhoods would be worse off. Whether the traffic and schoolchildren associated with a large household are on net a cost or a benefit to the rest of society thus depends on the curvature of the relationship between traffic or schoolchildren and external harm. No a priori answer is possible.

D. Equilibrium, optimality, and market failures

Despite the presence of modest economies of scale in household formation, markets can achieve a reasonably efficient equilibrium under certain conditions. The case for government intervention is built around the failure of these conditions.

Ellickson, Grodal, Scotchmer, and Zame (1999) (EGSZ) presents the basic results about how markets can assign people to households optimally. In a world with a continuum of agents who both trade goods and join clubs, they show that a competitive equilibrium exists and is Pareto optimal. Households are an example of clubs. Agents take as given the prices of goods as well as the membership fees for various clubs (which can discriminate based on characteristics). Clubs have to be small relative to the measure of agents.

These results depend on four strong conditions being met:

(i) Agents care about what clubs they belong to, and about who else belongs to these clubs, but membership imposes no obligations beyond paying the fee, which is perfectly observable and costlessly verifiable.

(ii) All agents know their utility functions over goods and clubs, and get to maximize utility.

(iii) Externalities may operate among agents in the same club, but nothing that happens within a club (which is only joining or not joining) affects agents outside the club.

(iv) All distortions are eliminable. Governments and monopolies play no role. There are no taxes or transfers, price floors or ceilings, or goods priced wrongly.

None of these four conditions for the EGSZ result holds for households in New York today. In this section we will consider each condition, examine how it fails and what the consequences of its failure are, and ask what sort of policies these market failures imply.

(i) Conditionless club membership with verifiable fees

The obligations and privileges of household membership in New York are not governed by verifiable contracts, for the most part. At best, households are governed by relational contracts, with a few items (inheritiances, divorce terms, gross physical abuse, health insurance and some pension terms) subject to review by judicial authorities. Promises to other members of one's household are generally not enforceable. The husband who fails to bring home the orange juice he promised his wife is not subject to judicial sanction.

It is easy to see the effect of such limitations on contracting. In the limit, if no contracts of any kind, relational or explicit, were possible on household formation, no households would have more than one member. Households would be inefficiently small. In general, we should think of contracting limitations as working in this direction (although we are aware of no theorem that proves this). Contracting limitations prevent some Pareto-improving increases in household size from occurring.

45

Thus governments can often make Pareto improvements possible by enforcing implicit or explicit contracts that help households form. The traditional state support of heterosexual monogamous marriages is a good example of such a policy; so is the traditional effort governments make to enforce scrupulously the terms of legitimate wills. In the same vein, implicit contract enforcement appears in prosecution of domestic violence cases and collection of child support and alimony payments. If the police arrest and punish perpetrators of domestic violence, then women find it easier to live with men whose promise of refraining from violence would otherwise be worth very little.

The optimal terms of laws enforcing implicit or explicit contracts like this are beyond the scope of this paper. So are the questions of whether marriage-like protection should be extended to homosexual, polygamous, and polyandrous relationships; and whether adultery should once again be a crime. The important points are that government policies of this type matter, and that because they are unlikely to achieve a first-best outcome, households will generally be too small on this count.

(ii) Universal utility-maximizing

The major problem for this condition is children: they often do not know what is in their best interest, and they almost never have legal standing to effectuate their choices unilaterally. Does this problem cause systematic deviations from Pareto optimality?

One possibility is that it results in households with too few adults, since children are often better off with more caregivers present.[17] But having more caregivers is not free: a

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[17]Another possibility is that children are more concentrated in certain households than

household with more adult caregivers must either spend more to acquire more space, or suffer from greater crowding. Both adjustments hurt children: the first hurts indirectly because it leaves less money available to spend on other goods; the second hurts directly because crowding is bad for children. Some adults, moreover, are poor caregivers or even child abusers.

Indiscriminate promotion of households with larger numbers of adults therefore seems like a poor policy for addressing this problem. More targeted measures like child support, however, can be justified on this basis. Individuals who because of blood ties may be expected to be fairly well-motivated caregivers should be discouraged from leaving households where they would be good caregivers. The same might be true of older siblings.

(iii) No extra-club externalities

We have already discussed these externalities. The main negative externalities from larger households are faster spread of communicable diseases and bad influences on other children if the larger households are deficient in space or caregiving. The second externality merely extends and intensifies the problems that arise because children are legally and intellectually incompetent. Some mentally ill people may also react poorly to living in a large household, and those reactions may be bad for themselves or for others, or costly if hospitalization is involved.

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they would be at an EGSZ equilibrium where they were in fact agents. The idea here is that second and third children who acted as knowledgeable EGSZ agents would arrange to have themselves adopted by childless couples more often than actually occurs now. This notion is fairly speculative and no clear policy implications follow from it. In some ways, the child protective system mimics the EGSZ market by removing children from households they would almost certainly leave if they could.

(iv) No other distortions

Household size is a complement or a substitute for many types of consumption that are not priced at marginal cost. Bigger households economize on housing, mail delivery, water, heating fuel, food packaging and garbage disposal. Since these goods are usually underpriced, households do not fully internalize the social benefits of larger size. Transportation (except basic car insurance) is usually underpriced, too, but it is not clear how household size affects demand for transportation (Nelson [1988] finds some economies of scale, but intuitively the more people in a household, the more different destinations to be distant from.) On the other hand, food (because of agricultural policies and protectionism) and electricity may be overpriced, and larger households economize on these, too.

Table 14 summarizes our conclusions about the way equilibrium household size is likely to deviate from optimal. The weight of the evidence seems to indicate that household sizes are too small, at least as far as the number of adults is concerned, or would be in the absence of state intervention. We have no great confidence in this conclusion, however, since we have arrived at it through a great deal of supposition and very little direct evidence. We have also not considered whether state interventions that encourage larger households--family law, domestic violence policing, and child support enforcement, for instance--more than compensate for these market failures.

On the other hand, we find little justification for policies that make households smaller -- such as most of those that we have surveyed.

6. Conclusion

We have shown that household size responds to policies and to exogenous economic forces, and that it has large implications for resource allocation, poverty alleviation, and the way we live. Because household size is important and because it is malleable, wise policies are needed. Many policies, and certainly housing policies, affect household size, but it is not at all clear that they are wise. They do not address in any systematic fashion the market failures we identified in section 5.

Of course, many of the policies that discourage large households are based on arguments about fairness, not about efficiency. If a two-person household can meet all its nutritional needs with 92 percent as much per capita expenditure as a one-person household, why should the government give the two-person household more food stamps than it needs? Wouldn't it be unfair if equally deserving members of two-person households ate better than members of one-person households? Should people who live in small households be disriminated against?

We have several answers to this argument. First, some programs like section 8 and public housing actually discriminate against large households in the sense that their members are less likely to receive any subsidies at all. A program like food stamps is at least prima facie non-discriminatory in that members of large households eat no worse than members of small (the government just appropriates whatever savings are realized from economies of scale). The same cannot be said for section 8 and public housing: large households are on average housed worse than small, because they are less likely to receive any subsidies at all.

Second, even if selection probabilities were equalized across household sizes in non-universal programs like section 8, public housing, and rent control, we do not see any

49

coherent vision of fairness that informs how these programs operate and that would be violated if larger households received better housing. That is because these programs already discriminate against non-recipients, no matter how deserving they might be. If it is morally acceptable for the government to treat small household A, who receives a subsidy, better than small household B, who is equally deserving but does not--why is it wrong for the government to treat large recipient household C better than A?

Third, and most fundamentally, even for universal programs, the meaning of "fair treatment" for people who have different abilities and opportunities for living with others is not clear. Consider, by way of analogy, how we currently treat people who have pleasant dispositions and are easily satisfied with the most meager of possessions, as opposed to those who are dour, depressed, materialistic and never satisfied. People with sunny dispositions are clearly better off, at any equal income, than people with sour dispositions, but we do not attempt to deprive them of their good luck by taxing them more highly or reducing their food stamp allotments (outside of *Gulliver's Travels*).

Similarly some people have the good fortune to be able to get along well with others, manage in household settings, and operate with little privacy. Some people are blessed by having met someone with whom they want to share their life. Others are not so lucky. Should the kind of good luck that allows people to flourish in large households be treated like the good luck that allows some people to have sunny dispositions (or large inheritances), or the kind of luck that brings good health and high-paying jobs?

We do not profess to have an answer to this question. Nor do we have answers to a long series of questions more closely related to policy: Why shouldn't food stamp allotments and

50

section 8 budgets be directly proportionate to household size? Why shouldn't "deeming" (reducing the grant that recipients receive when they live with non-recipients who have income) be eliminated from TANF and SSI? When doubled-up families appear at the Emergency Assistance Unit looking for shelter, why shouldn't their hosts be paid to keep them a few more nights, or be promised a subsidized unit for themselves? Why shouldn't New York City pay households to take in "foster adults," rather than placing those adults in shelters? Why shouldn't homeowners' tax preferences be restricted to families with children, or be more generous for such households? Why shouldn't aunts, uncles, grandparents and family friends qualify for tax benefits when they live in a household with children?

The purpose of this paper has been to raise these questions (and many more like them), and to provide some of the tools for answering them. Household composition is not immutable and should not be taken for granted.

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Table 1
Average Household Composition, 2000

	New York City	United States	Manhattan	Queens
Adults				
Householder	1	1	1	1
Spouse	0.372	0.516	0.25	0.47
Unmarried partner	0.052	0.052	0.06	0.04
Adult son/daughter	0.254	0.179	0.13	0.30
Other relative	0.174	0.091	0.09	0.24
Other nonrelative	0.114	0.086	0.13	0.13
Subtotal	1.966	1.924	1.66	2.18
Minors				
Own children	0.544	0.611	0.29	0.55
Other children	0.080	0.057	0.05	0.08
Subtotal	0.624	0.668	0.34	0.63
Total	2.590	2.594	2.00	2.81

Source: 2000 Census of Population. Adult means 18 years or older.

Table 2
Average Household Composition, 2000

	New York City	Remainder of CMSA
Adults		
Householder	1	1
Spouse/unmarried partner	0.422	0.601
Other adult	0.542	0.443
Subtotal	1.966	2.044
Minors		
Own children	0.544	0.636
Other children	0.08	0.053
Subtotal	0.624	0.69
Total	2.59	2.734

Source: 2000 Census of Population.　　Adult　means 18 years old or older.

Table 3
Household Size in Other Large Cities, 2000

	Mean Household Size	Children/ Household	Respondent and Partners/Household	Other Adults/ Household
Ten Largest Cities in U.S.				
NYC	2.59	0.62	1.42	0.55
LA	2.83	0.75	1.48	0.60
Chicago	2.67	0.7	1.41	0.56
Houston	2.67	0.73	1.48	0.46
Philadelphia	2.48	0.63	1.38	0.47
Phoenix	2.79	0.79	1.54	0.46
San Diego	2.61	0.63	1.51	0.47
Dallas	2.58	0.68	1.44	0.46
San Antonio	2.77	0.79	1.53	0.45
Detroit	2.77	0.85	1.34	0.58
Cities over 100,000 in New York PMSA				
Newark	2.85	0.81	1.38	0.66
Jersey City	2.67	0.66	1.43	0.58
Yonkers	2.61	0.63	1.49	0.49
Paterson	3.25	0.97	1.48	0.8
Bridgeport	2.7	0.77	1.42	0.51
Elizabeth	2.91	0.76	1.5	0.65

Source: 2000 Census of Population.   Adult   means 18 years old or older.

Table 4

Change in Average Household Composition, 1990-2000

	New York City	United States	Manhattan	Queens
Adults				
Householder	0	0	0	0
Spouse	-0.018	-0.035	-0.01	-0.02
Unmarried partner	+0.015	+0.034	+0.02	+0.01
Adult child	-0.029	-0/031	-0.03	-0.02
Other relative	+0.029	+0.012	0	+0.06
Other nonrelative	+0.013	NA[18]	+0.02	+0.02
Subtotal	+0.010	+0.020	0	+0.05
Minors				
Own children	+0.036	-0.014	+0.01	+0.06
Other children	+0.006	-0.004	0	+0.02
Subtotal	+0.042	-0.018	+0.01	+0.08
Total	+0.052	-0.038	+0.01	+0.13

Source: 2000 Census of Population. Adult means 18 years or older.

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[18]Change combined in unmarried partner cell.

Table 5
Trends in Average Household Size, U. S., 1955-2000

	Adults	Minors	Total
1940	2.53	1.14	3.67
1955	2.19	1.14	3.33
1970	2.05	1.09	3.14
1980	1.97	0.79	2.76
1990	1.94	0.69	2.63
2000	1.92	0.67	2.59

Source: 1940 data from Current Population Reports, Household and Family Characteristics ; New York Times Almanac 1998, p. 285; 2000 Census of Population.

Table 7
Variables Used in Analysis (1997-1999 pooled data)

Variable	N	Mean	Standard Deviation
Year=1989	2874	0.522	0.500
Black	2874	0.331	0.471
Hispanic	2874	0.230	0.421
Asian	2874	0.059	0.235
Foreign-born	2874	0.381	0.486
1-2 children	2870	0.539	0.499
3+ children	2870	0.149	0.356
Income per adult	2874	$13,007	$11,513
Assets per adult	2248	$14,381	$24,002
Public assistance	2874	0.102	0.303
SSI	2874	0.043	0.204
Food stamps	2874	0.137	0.344
Public housing	2377	0.067	0.250
Section 8	2874	0.073	0.260
Jiggets	2874	0.005	0.072
Rent control	2450	0.263	0.440

Variable	N	Mean	Standard Deviation
Homeowner	2873	0.300	0.459
House	2874	0.333	0.471
Partner/spouse	2863	0.534	0.499

Table 8
Housing Use in New York City, 1999
(Standard deviation in parentheses)

	Mean Number of Adults per Household	Mean Number of Adults other than Partner/Spouse
Total	2.07 (0.97)	0.54 (0.94)
White	1.99 (0.81)	0.40 (0.78)
Black	2.07 (1.07)	0.65 (1.03)
Hispanic	2.13 (1.00)	0.59 (0.96)
Asian	2.32 (0.97)	0.62 (1.06)
Immigrants	2.19 (0.97)	0.61 (0.98)
Non-immigrants	2.00 (0.96)	0.51 (0.92)
No children	1.91 (1.01)	0.54 (0.98)
1-2 children	2.17 (0.92)	0.55 (0.92)
3+ children	2.08 (1.00)	0.49 (0.94)
Below median income	2.16 (1.08)	0.70 (1.06)
Above median income	1.98 (0.83)	0.38 (0.78)
Public assistance	1.77 (0.97)	0.51 (0.90)
SSI	1.77 (0.96)	0.50 (0.85)
Food stamps	1.77 (0.99)	0.50 (0.90)
Receiving no food stamps, public assistance, or SSI	2.13 (0.96)	0.55 (0.95)

	Mean Number of Adults per Household	Mean Number of Adults other than Partner/Spouse
Rent controlled	1.88 (0.86)	0.44 (0.78)
Public housing	1.77 (0.89)	0.44 (0.73)
Section 8	1.73 (0.91)	0.44 (0.78)
Jiggets	1.53 (0.64)	0.2 (0.41)
All renters	1.95 (0.90)	0.47 (0.84)
Homeowners	2.28 (1.04)	0.61 (1.08)
Living in house	2.36 (1.10)	0.72 (1.15)
Living in apartment/coop/condo	1.93 (0.86)	0.45 (0.80)
Partner/spouse	2.34 (0.74)	0.35 (0.72)
No partner/spouse	1.77 (1.10)	0.77 (1.10)

Table 9
Poisson Regressions of Number of Adults in Household Other than Respondent
z-values in parentheses

	Model 1	Model 2	Model 3	Model 4
Intercept	0.202 (0.081)	0.337 (0.095)	0.318 (0.095)	0.245 (0.097)
Year=1989	0.004 (0.051)	0.048 (0.055)	-0.019 (0.059)	-0.020 (0.059)
Black	-0.028 (0.058)	-0.074 (0.065)	-0.071 (0.065)	-0.082 (0.065)
Hispanic	0.070 (0.066)	0.008 (0.072)	0.026 (0.073)	0.036 (0.073)
Asian	0.134 (0.102)	0.102 (0.112)	0.088 (0.112)	0.090 (0.112)
1-2 kids	0.231 (0.055)	0.192 (0.062)	0.185 (0.062)	0.166 (0.062)
3 or more kids	0.215 (0.076)	0.171 (0.085)	0.162 (0.085)	0.134 (0.086)
Foreign-born	0.079 (0.050)	0.074 (0.056)	0.077 (0.056)	0.069 (0.056)
Income per adult	-2.23e-5 (3.29e-6)	-2.73e-5 (5.64e-6)	-2.79e-5 (5.64e-6)	-2.72e-5 (5.66e-6)
(Income/adult)^2	1.10e-10 (2.94e-11)	2.79e-10 (1.04e-10)	2.75e-10 (1.05e-10)	2.80e-10 (1.05e-10)
Food stamps	-0.446 (0.110)	-0.448 (0.120)	-0.430 (0.120)	-0.414 (0.120)
Public assistance	-0.004 (0.124)	-0.061 (0.134)	-0.064 (0.134)	-0.062 (0.134)

	Model 1	Model 2	Model 3	Model 4
SSI	-0.213 (0.124)	-0.104 (0.134)	-0.082 (0.134)	-0.084 (0.134)
Section 8	-0.274 (0.106)	-0.275 (0.119)	-0.256 (0.120)	-0.225 (0.120)
Public housing	-0.304 (0.099)	-0.312 (0.107)	-0.283 (0.108)	-0.212 (0.110)
Jiggetts	-0.530 (0.420)	-0.473 (0.422)	-0.441 (0.423)	-0.396 (0.423)
Rent control	-0.235 (0.053)	-0.220 (0.058)	-0.147 (0.062)	-0.088 (0.064)
Assets/adult		-3.54e-6 (1.43e-6)	-4.70e-6 (1.47e-6)	-4.55e-6 (1.47e-6)
Home ownership			0.290 (0.079)	0.191 (0.083)
House				0.242 (0.063)
Pseudo R-squared	0.032	0.034	0.037	0.041
N	1984	1586	1586	1586

Table 10
Poisson Regressions of Number of Adults in Household
other than Respondent and Spouse/Partner
z-values in parentheses

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.222 (0.116)	0.075 (0.118)	0.340 (0.134)	0.306 (0.135)	0.160 (0.139)
Year = 1989	0.005 (0.073)	-0.010 (0.073)	0.062 (0.080)	-0.015 (0.084)	-0.020 (0.084)
Black	0.286 (0.085)	0.175 (0.086)	0.063 (0.094)	0.065 (0.094)	0.039 (0.095)
Hispanic	0.236 (0.097)	0.212 (0.098)	0.081 (0.106)	0.109 (0.107)	0.117 (0.107)
Asian	0.186 (0.155)	0.214 (0.155)	0.116 (0.171)	0.109 (0.171)	0.111 (0.171)
1-2 kids	-0.092 (0.077)	0.081 (0.079)	0.033 (0.088)	0.030 (0.088)	0.003 (0.088)
3 or more kids	-0.263 (0.113)	0.029 (0.116)	-0.061 (0.127)	-0.064 (0.127)	-0.105 (0.127)
Foreign-born	0.101 (0.071)	0.128 (0.071)	0.117 (0.079)	0.126 (0.079)	0.115 (0.079)
Income per adult	-4.96e-5 (5.10e-6)	-4.73e-5 (4.98e-6)	-6.01e-5 (7.44e-6)	-5.96e-5 (7.44e-6)	-5.82e-5 (7.48e-6)
$(\text{Income/adult})^2$	2.51e-10 (3.30e-11)	2.34e-10 (3.33e-11)	6.11e-10 (1.23e-10)	5.94e-10 (1.24e-10)	6.05e-10 (1.26e-10)
Food stamps	-0.396 (0.145)	-0.523 (0.145)	-0.534 (0.158)	-0.512 (0.159)	-0.469 (0.157)
Public	0.126	0.071	-0.062	-0.067	-0.066

	Model 1	Model 2	Model 3	Model 4	Model 5
assistance	(0.162)	(0.162)	(0.177)	(0.177)	(0.176)
SSI	-0.030 (0.152)	-0.133 (0.152)	-0.052 (0.164)	-0.027 (0.164)	-0.041 (0.164)
Section 8	-0.258 (0.141)	-0.376 (0.140)	-0.335 (0.154)	-0.314 (0.156)	-0.269 (0.158)
Public housing	-0.285 (0.133)	-0.397 (0.134)	-0.408 (0.144)	-0.370 (0.145)	-0.226 (0.148)
Jiggetts	-0.716 (0.591)	-0.792 (0.591)	-0.721 (0.594)	-0.681 (0.595)	-0.590 (0.596)
Rent control	-0.253 (0.076)	-0.325 (0.077)	-0.321 (0.083)	-0.233 (0.088)	-0121 (0.092)
Partner/spouse present		-0.742 (0.074)	-0.763 (0.081)	-0.792 (0.082)	-0.803 (0.082)
Assets/adult			-4.21e-6 (2.00e-6)	-5.91e-6 (2.08e-6)	-5.59e-6 (2.07e-6)
Homeownership				0.390 (0.117)	0.199 (0.121)
House					0.471 (0.088)
Pseudo R-squared	0.042	0.069	0.076	0.079	0.088
N	1984	1978	1583	1583	1583

Table 11
Food Costs per person, relative to one-person household

Household Size	USDA (1998)	(2/3) Rule	Nelson
1	1	1	1
2	.92	.79	.59
3	.88	.69	.54
4	.84	.63	.35
5	.80	.58	.30
6	.80	.55	.26
7	.75	.52	.23

Sources: USDA: U.S. House of Representatives, 1998, p. 935. Nelson: Nelson (1988), table 1, p. 1308.

Table 12
Housing Costs per Person, Relative to One-Person Household

Household Size	HUD-NYCHA	(2/3) Rule	Nelson
1	1	1	1
2	.56 or .63	.79	.25
3	.42	.69	.11
4	.32 or .40	.63	.06
6	.26	.55	
7	.25	.52	

Sources: Fair market rentals: Federal Register, volume 66, number 190, October 1, 2001; page 50062. NYCHA occupancy standards: NYCHA. Nelson: Nelson (1988), table 1, p. 1308.

Table 13
Total Costs per Person, Relative to One-Person Household

Household Size	Food stamps	Orshansky	Lazear-Michael
1	1	1	1
2	.67	.64	.53
3	.56	.52	.43
4	.51	.50	.37
5	.48	.47	.34
6	.45	.45	
7	.44	.43	

Sources: Food stamps: U.S. House of Representatives, 1998, p. 931. Orshansky: Nelson (1993), table 1, p. 472. Lazear-Michael: Lazear and Michael (1980), table 4, p. 102.

Table 14
Summary of Market Failures and Effects on Household Size

Market Failure	Implications for Observed Household Size
Weak contracts	Too small
Lack of input from children	Too few adults or too many children
Extra-household externalities	Unclear
Other distortions	Unclear; maybe too small