Housing surveys
Advances in theory and methods

edited by

Carole Desprès and Denise Piché
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# Housing surveys

## Advances in theory and methods

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Improving national housing surveys. A choice-theoretic framework

by John R. Miron

Abstract

Housing survey is a concept that differs significantly from one application to the next. Nonetheless, what housing surveys have in common is that they can reveal information about consumer choice. A well-informed choice presumably reflects consumer preference, and housing surveys can thereby inform both scholars and suppliers in the housing market. At the same time, consumers choose from a choice set that is limited by constraints. Identifying the limits of that choice set is the second important function of a housing survey. This paper focuses on how housing surveys might advance thought in terms of the strategies that individuals use to cope with, or adapt to, a stock of housing that is scarce, expensive, inaccessible, or otherwise unsuitable. The paper focuses on quantitative methods and a user's perspective on large-scale survey data that describe choices. The paper outlines the methodology currently employed in large-scale surveys in Canada and elsewhere. Two main kinds of housing survey are identified: surveys of stock or service, and surveys of housing condition. This paper discusses modern approaches to each. This includes a review of the four main surveys of housing condition in Canada. The paper then sets out a methodological framework based on the work of Becker (1981), and concludes with a discussion of what ought to be included in a survey of housing condition.

Introduction

In this conference, we have seen that housing surveys are widely used today. We have also seen that such surveys differ considerably in terms of content and methodology. They also vary in scope from small-scale ethnographic case studies to large-scale statistical surveys. The conference has examined three basic questions. What can be learned from large-scale surveys of housing or housing condition? What can be learned from smaller specialized surveys? Finally, how can surveys be made more useful given the rapid transformation of society in recent decades? Answers can come from two distinct (albeit overlapping) sets of perspectives: that of the scholar and that of the practitioner. Employing a perspective that varies from one discipline to the next, scholars would ask how such surveys might advance thought and research method. Practitioners, varying likewise in perspective, would look to the issues of public policy, planning, and practice inherent.

This paper is a personal response to these questions, considered in terms of how housing surveys advance scholarship in that part of the social sciences wherein I work. My interests are broadly in the area of consumer choice operating within the context of a specific geography and a competitive housing market. I am intrigued, for instance, by the housing strategies that individuals, as economic actors, use to cope with a stock of housing that is scarce, expensive, inaccessible, or otherwise unsuitable. This paper considers how data from housing surveys advance understanding of the choices made by these actors. At the same time, consumers choose from a choice set that is limited by constraints. Identifying the limits of that choice set is the second important function of a housing survey. As I have not had cause to use attitudinal (stated preference) survey data, my comments focus on quantitative methods and survey data that describe choices (revealed preferences) rather than attitudes. In addressing these questions, I restrict my comments to the surveys, methods, and data sources with which I am most familiar. In my own research, for example, I have used mainly large-scale general surveys of housing condition. Also, I have been a user of housing survey data, not a producer, and here give a user's perspective on what ought to be in a housing survey.
State of the art in large-scale housing surveys in Canada

Let us begin by characterizing current practice in large-scale housing surveys. The term, "large-scale housing survey," is here used to refer to any survey (typically a survey of residents, but may also be a survey of landlords, property managers, appraisers, or other knowledgeable agents) that (1) queries the condition of the existing housing stock and/or the living conditions of residents, (2) uses questions for which answers are either numerical or are to be drawn from a precoded list of possible answers, (3) is sufficiently large in size and geographic coverage to permit national estimates of housing stock and/or condition, and (4) is intended to provide a microdata sample for subsequent use by a broad group of housing scholars. Surveys are costly. Large-scale housing surveys have become popular because they allow many researchers each to undertake their own analysis using a common sample. Typically, large-scale housing surveys are undertaken by public agencies who first do their own analyses on the survey data, then edit the sample in various ways to preserve the privacy of individual respondents, and finally release a microdata sample to scholars. Since it is the microdata sample that scholars like me get to see, I will use "sample" and "survey" interchangeably.

A good example of a housing survey/sample is the public use microdata sample (PUMS) that is now made available from each Census in Canada, the United States, and elsewhere. These census samples have been widely used to study housing condition; especially in Canada where the Census is quinquennial. In the last couple of decades, these census samples have been supplemented by omnibus housing surveys: e.g., the American Annual Housing Survey (AHS), and the one-time-only Canadian Survey of Housing Units (SHU), conducted in 1974. In addition to these, Statistics Canada also periodically provides two other microdata samples, the Household Income, Facilities, and Equipment (HIFE) and Family Expenditure Survey (FES) samples, that include substantial amounts of information about dwelling characteristics and living conditions. We should also mention here the Rent and Vacancy Survey (RVS) conducted semiannually by Canada Mortgage and Housing Corporation (CMHC). For large Canadian cities, CMHC surveys all conventional rental apartment buildings of six or more units in selected cities. (See Table 1 for summary of national housing surveys in Canada.)

What are some of the distinctive features of large-scale housing surveys? One common feature is that they are typically designed with several distinct, and at times incompatible, purposes in mind. One user might want to know something about the nature of the existing housing stock (for example, period of construction, type of dwelling, floor area, number of rooms, layout and design, the nature of water supply and sewage disposal, fire safety standards, property ownership, or recent renovation and conversion) or the potential for new additions, conversions, and demolitions. Another user might want to know something about the housing "service" or quality of accommodation provided by that unit of stock: for example, state of repair, frequency of breakdown in heating, water, air conditioning, or other building services, availability of parking, or the level of building security. Still another user might focus on whether, where and how people are housed: this would include, for example, studies to measure homelessness, living arrangement, and the incidence of collective versus private accommodation. Finally, another user might want to look at the suitability of accommodation vis-à-vis the needs of the consumer; for example, studies of crowding, new household formation, security of tenure and contracting, residential satisfaction and mobility, domestic violence, or affordability. In principle, a single-purpose survey can be designed to suit optimally the research needs of any one of these users. In a large-scale housing survey, the survey designer has to take into account the varying interests of users, and hence the potential for incompatibility. This dilemma can be nicely illustrated using the example of the population census. See Miron (1988: 24-25).
Table 1
Canadian surveys on housing stock and condition

<table>
<thead>
<tr>
<th>Survey name</th>
<th>Origins</th>
<th>Coverage</th>
<th>Frequency</th>
<th>Aims</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUMS: Public use microdata sample</td>
<td>Statistics Canada</td>
<td>Population and housing</td>
<td>Quinquennial</td>
<td>to enumerate population</td>
</tr>
<tr>
<td>SHU: Survey of Housing Units</td>
<td>Statistics Canada</td>
<td>Housing condition</td>
<td>1974 only</td>
<td>to assess dwelling conditions</td>
</tr>
<tr>
<td>HIFE: Household Income, Facilities, and Equipment</td>
<td>Statistics Canada</td>
<td>Household equipment</td>
<td>Annual</td>
<td>to describe household facilities</td>
</tr>
<tr>
<td>FES: Family Expenditure Survey</td>
<td>Statistics Canada</td>
<td></td>
<td>Biennial</td>
<td>to detail family expenditures</td>
</tr>
<tr>
<td>RVS: Rent and Vacancy Survey</td>
<td>CMHC</td>
<td>Housing stock</td>
<td>Annual</td>
<td>to assess rents and vacancies in conventional rental apartment buildings of six or more units in selected large cities</td>
</tr>
</tbody>
</table>

From the perspective of the Canadian government as a user of its own census data, the fundamental purpose of the census is to count people; put differently, to count each and every person once and only once on census day.

To avoid miscounting, the Canadian census, for example, assumes that every person has a "regular place of residence" on census day. Census takers then canvas potential regular places of residence. In the Canadian census, a "household" is simply the group of individuals sharing the same regular place of residence, and there is a one-to-one correspondence between the set of households in Canada, and the set of occupied dwellings. Over the years, Statistics Canada has included in the census many questions about the composition of each household, its dwelling, and its living conditions.

Why is this problematic if we want to think of the Census as a large-scale housing survey? First, the Canadian census looks only to one regular place of residence; it ignores the fact that individuals may have more than one place of residence. Seasonal dwellings are ignored; so too are the secondary living arrangements of persons who may spend part of the week regularly resident elsewhere. Second, the Canadian census in principle, includes any regular place of residence as a "dwelling," right down to a dugout in the ground if used for human habitation. In principle, there is no such thing as homelessness in the Canadian census: merely people whose "living quarters" lack basic facilities. Whatever the merits of this approach, census counts of dwellings may thus bear only an imperfect relationship to a count of what is conventionally thought to be the housing stock. Third, despite their best efforts, the census continues to miss some homeless and other individuals who do not have a discernible regular place of residence. Fourth, the census definition is "lumpy" in nature because an individual has to be either inside or outside the household. Grandmother who comes in daily to help prepare meals is not part of the household if her regular place of residence is elsewhere. Neither is the friend down the street who helps with daycare. What I am arguing here is that there is a fine line between studies of time budget and studies of living arrangement. Just how different is the question of who lives here from the question of who spends time here? Such subtleties are beyond the scope of a population census.

The principal advantage that omnibus housing surveys have over population censuses is that they provide more detail about housing condition. At the same time, one disadvantage is that omnibus surveys are still typically based on the same sampling frame: the universe of regular places of residence as defined in the census. The 1974 Survey of Housing Units, for example, took as its universe, the set of dwellings enumerated in the 1971 census plus new dwelling completions since then. This tied SHU, wittingly or unwittingly, to the concept of housing and household employed in the census.
A second feature common to large-scale housing surveys has to do with universe of interest. In most housing surveys, the statistical population is the set of occupied dwellings and/or the housing condition of the households resident there. In effect, these are "one-stop" surveys of both housing condition and housing stock. The PUMS, HIFE, FES, and SHU samples can each be thought of as one-stop surveys, because they are based on surveys that cover only occupied dwellings. As an alternative, suppose that the statistical population is the set of all potential dwellings (whether occupied or unoccupied): identified by the fact that every observation (i.e., dwelling) meets some minimum standards to qualify as a structurally-separate set of living quarters. Only RVS, among the above-mentioned surveys, is of this type, although recent censuses of Canada have increasingly attempted to enumerate the stock of unoccupied dwellings: see Miron (1988: 149-153).

A third feature common to many large-scale housing models has to do with the methodology of reporting. In general, large-scale housing surveys rely on self-reporting and do not fully verify responses. In principle, the designer of a housing survey can choose among four sources of information: residents, landlords (in the case of rental buildings), property managers (in the case of rental buildings, condominiums, or cooperatives), and third-party agents (for example, professional housing assessors and appraisers). In practice, many surveys (PUMS, HIFE, FES, and SHU) rely on just one source: household (i.e., resident) interviews. The exception here, RVS, queries the building superintendent. In all of these, errors may arise because the respondent does not know the correct answer, or is being guileful: homeowners may deliberately misstate the expected selling price of their dwellings; tenants may overstate the frequency of breakdown; landlords may overstate the quality of service provided. Further, given the diversity of individuals with respect to preferences, life cycle stage, social and economic circumstances, and heterogeneity of the housing stock, it should not be surprising to find that people have differing views of the merits of any one particular dwelling. This diversity raises the question of whose opinion, from within the household, should be sought in a survey? Some surveys seek to query "person 1," the householder, household maintainer, or household head; others accept any adult in the household.

That many large-scale housing surveys rely on self reporting creates another conundrum. In a competitive market for housing, households who are dissatisfied with their housing may well be able to relocate. In the context of work by the American economist Charles Tiebout, this is a process colorfully called "voting with their feet." Hence, at the time that a survey is conducted, it should not be surprising to find that the incidence of dissatisfaction is low. For instance, suppose a particular dwelling is located close to an expressway and consequently has a high ambient noise rating. Potential residents who are averse to noise will either choose not to live there, or if they do will soon move out. The surveyor finds there instead residents who are relatively insensitive to the noise. Suppose that planners were then able to devise a new noise abatement scheme. The impact of such a scheme would not however be just the mild improvement in well-being of the present, noise-insensitive residents; it would also include the benefit to noise-sensitive individuals now able to move into this neighborhood. Put differently, this comment points out the danger of looking at residential satisfaction or willingness-to-pay in a static setting: that is, without understanding the effect of choice (residential mobility).

Surveys of housing stock and housing service

Let us now turn specifically to large-scale surveys of housing stock and service. How might we best survey the housing stock? A survey of stock would use the stock of dwellings (occupable boxes) as its universe. Since not all of these boxes would in fact be occupied (whether by regular residents or others), the questionnaire would presumably have to be addressed to the property owner rather than the resident. In Canada, one example of a housing stock survey is the RVS.

To define a universe of dwellings, we need to be clear about the concept of a dwelling. What exactly is a dwelling? In the Canadian census, a dwelling is a structurally separate set of living quarters with its own private entrance (that is, does not require the resident to pass through another dwelling in order to reach their own). See Miron (1988: 18-21). In practice, the notion of dwelling is generally straightforward: as when a lone individual, or family with small children, lives in a detached dwelling or conventional apartment. However, this definition becomes less clear when individuals share some parts of a habitable structure, but otherwise carry on daily life as separate units. The problem here is that the notion of dwelling is both a physical and a social construct. It cannot be defined solely on the basis of physical appearance of the empty "box" formed by ceilings, floors, and walls.

The need for a separate survey to obtain housing stock data may today be waning. In many cities, governments have built databases from property tax and assessment information. While the exact
Improving national housing surveys

practice varies from one city to the next, these databases generally include zoning, demolition, building permit, ownership, selling price, and other information about the property. While assembled mainly for administrative purposes, such databases can also be a substitute for dwelling survey data.

From a well-developed database of this type, we should be able to construct a system of housing accounts: see Moore and Skaburskis (1993). Housing accounts track volumes of construction and demolition, and transitions in the stock (for example, conversions and deconversions). From a system of housing accounts, analysts can construct detailed summaries of gross and net changes in the stock of residential properties over time. However, administrative databases cannot entirely replace a comprehensive survey of housing stock. One indicator of this is that, to the best of my knowledge, no metropolitan region has yet developed a satisfactory system of housing accounts from an administrative database. Why not? One common problem with such databases is that they are generally based on the property unit as observation, rather than the dwelling unit. Another "problem" with administrative databases is that we do not have a way of independently verifying the housing account estimates. The best alternative source of housing counts is the census, but housing accounts estimates can (and should) be expected to differ from these. Still another problem with administrative databases is that they tell us little about ownership of the housing stock. In a study of the redistributive impacts of rent control in Ontario, for example, I found little information about landlords, and hence ultimately about who benefits or disbenefits on net from rent control. A survey of housing stock could provide valuable new information in this regard. Administrative databases are also of little use if we want to study the potential for new additions to the housing stock. For this, we would need to survey real estate developers, financiers, and other agents about their intentions and motivations.

Let us now turn briefly to surveys of the level of service (quality) provided by the housing stock. Since we are interested in the level of service that is, or could be provided, by a stock of housing; therefore, the sampling universe would again be the stock of dwellings. In the case of vacant dwellings, any survey questionnaire would have to be directed to the property owner. In the case of an occupied rental dwelling, the survey might best include separate questionnaires for landlord and tenant. The landlord would be best able to comment on repair and maintenance expenditures for example; tenants might best be able to comment on state of repair, frequency of breakdown in services, availability of parking, or the level of building security. I am not aware of any large-scale housing survey of this kind in Canada. An alternative to housing surveys are the administrative databases used to keep track of property maintenance compliance.

Surveys of housing condition

Now, let us consider the four principal modern large-scale survey samples that are, or have been used to assess housing condition in Canada: the 1974 SHU, the annual HIFE microdata file, the quinquennial PUMS, and the biennial FES. All four include large (stratified, except for PUMS) samples of households (spending units, in the case of FES) drawn from across Canada. Although undertaken for different purposes, all four have been administered by Statistics Canada using comparable definitions, and with substantial numbers of variables describing the household and its housing.

The four surveys have much in common. PUMS, SHU, and HIFE are based on surveys of census households; FES uses the closely related notion of a spending unit (a spending unit is the set of household members who make decisions about purchases in common). Each is available as a public use sample wherein certain information (notably location) is suppressed. None of these samples identifies geographic scale below the level of province and city (or city size class). Each is a "snapshot" of the household and its housing at one point in time (the survey date). All include similar information about household (spending unit) members: age, sex, marital and relationship to household head (person 1 in PUMS, spending unit head in FES), income, education, occupation, and work status. Each indicates the presence of children, the number of resident adults, and the number of earners, and recent change of dwelling. All include information on selected housing characteristics (type of dwelling, tenure, period of construction, rooms or bedrooms, water and sewer system connections), selected housing expenditures and prices (for example, rent paid by tenant household, and selling price of dwellings). FES, SHU, and HIFE include information on features included in rent (e.g., parking, appliances) and whether shelter expense is subsidized.

As a one percent random sample of all census households, PUMS is, by far, the largest of the microdata samples discussed here. This sample has been available quinquennially since 1971. In some cases, it identifies the specific metropolitan area from which a sampled household is drawn;
otherwise, it shows only province and type of urban (or rural) place of residence. PUMS is the only sample of the four that includes information about immigration and ethnicity.

The other three surveys have their own strengths. Of the four, SHU is by far the most comprehensive in terms of dwelling characteristics. SHU is the only sample to include floor area measurements for the dwelling. SHU also includes details of mortgages for home owners, and payments for utilities, fuel, parking, and common fees (condominium). SHU is the only study that includes detailed information about the previous dwelling and living arrangement of current household heads who had moved recently. SHU includes details of recent moves by the household head, including reasons why. SHU also is the only sample to include information about land uses nearby. HIFE is not nearly as comprehensive in housing data, when compared with SHU. Its advantages, however, are twofold. First, it is based on annual surveys that continue to the present day. Second, it contains much information about ownership of household furnishings—from appliances to fuel usage to heating equipment—and home repairs and renovation. FES, in contrast, typically contains only a modest amount of information about the dwelling occupied. Its strengths are twofold. First, it includes much information about housing expenditure and its components during the preceding calendar year. Second, it attempts to trace changes in the composition of the spending unit over the same period.

Also common to these surveys is an alarming absence of pertinent data. First, none of these surveys enquire as to how households actually use their homes. Second, these surveys don't enquire as to the history of the household. Survey data don't tell us, for example, how the household came to take its present form, or what pattern of moves culminated in the current place of residence. As well, these surveys don't enquire about aspects of employment history (e.g., hires, layoffs, firings, and wage and salary changes) that might help explain current housing condition (especially affordability). Third, all of these surveys omit important current-day information about household members that are relevant to assessing housing condition and choice: e.g., activity limitations, wealth. A fourth concern is that housing condition is typically thought to include neighborhood situation, yet these four surveys are largely silent about neighborhood quality. Only SHU includes a question of this kind; and it is only a reference to the type of abutting land use. Other surveys elsewhere, such as the AHS, have included questions about the physical environment. Such surveys attempt to measure a selection of spatial, human, and functional features of the neighborhood. In practice, they employ up to four categories of measures: accessibility to good jobs, schools, and shopping; proximity to other physical amenities or disamenities; abutting land use and fronting street traffic flow; and neighborhood social characteristics. Such measures could and should be regularly included in Canadian surveys of housing condition.

Improving large-scale housing surveys

A choice-theoretic framework

We have now completed a brief review of the state of the art in large-scale housing surveys. For the remainder of this paper, we will consider how large-scale housing surveys might be improved. To do so, we need a perspective that explains how individuals and households come to occupy their present dwellings. Here, I use a choice-theoretic framework which builds on the work of Becker (1981) and employs ideas to be found in McElroy and Horney (1982); McElroy (1985, 1990), Pollak (1985), England and Farkas (1986), Pugh (1990), Ott (1992), and Miron (1993) among others.

Suppose an individual seeks to maximize a lifetime utility function. Here, let us use a simple choice-theoretic framework in which there is no uncertainty. Our rational individual can foresee a utility level derivable for each year into the future through death (with provision for the utility attached to a bequest). The utility level in each year is itself a function of "domestic production": an activity which Becker envisages is undertaken by the household wherein store-bought goods, householders' time, and skill (human capital) are combined to produce "commodities," that determine the annual utility level. Much, but perhaps not all, of this domestic production occurs within the dwelling and may make use of specified dwelling features. Becker defines a commodity to be anything produced by the household for its own benefit. Some of these commodities, for example "self-esteem," are public goods within the context of the household; that is, consumption of them by household members is nonrivalrous and nonexcludable. Other commodities, such as "privacy" and "spiritual support" for individual household members may be excludable or rivalrous. Note that this definition of commodity can be broad enough to include, for example, the role of housing as status symbol for the household. Further, a choice-theoretic framework emphasizes the allocation of household labour among a variety of activities.
of activities: domestic production, paid work, and skill acquisition. Finally, a choice-theoretic framework emphasizes financial capital accumulation (through savings) and skill acquisition (or training).

Becker imagines that the household is governed by an altruist: critics might say a patriarch. Hence, domestic production is cast in terms of commodities that are classically thought to be "positive." However, in real life, some households, or household members, also produce what could be thought to be "negative" commodities: for example, domestic violence. An alternative is to think of such practices as failures in household governance. In a choice-theoretic framework, we can imagine that household behavior is the outcome of bargained behavior. In one version, Nash bargaining, each household member has a level of bargaining power proportional to their "threatpoint" (the utility of quitting the household), from which they negotiate domestic production. Gender differences in threatpoints may well be substantial.

Becker also casts the world as either inside or outside the household. Domestic production is seen to be undertaken only by household members, and for the benefit only of household members. With the notable exceptions of home work and telecommuting, paid work generally takes place outside the home. In reality, some domestic production for the household may be undertaken by persons resident elsewhere. The presence of social networks means that nonresident family members and other friends come in to help out the household from time to time.

A choice-theoretic framework presents several interesting insights into the nature of housing choice. First, it emphasizes the notion that housing is an intermediate good; something which consumers purchase in order to produce an end, such as good health. This implies that housing can be a substitute for, or substituted by, other inputs: for example, a bookshelf at home and a public library. To understand housing choices, we therefore have to understand something about the availability and prices of substitutes. Some of these substitutes are publicly provided goods, as in the library books mentioned above. Other substitutes may be commercially-supplied, as in movie theaters or daycare. As well, a choice-theoretic framework suggests that households may undertake domestic production in different ways depending on the design and layout of the dwelling; consumers cope with an inadequate design by substituting an alternative method of production.

Second, the choice-theoretic framework emphasizes the importance of a lifetime perspective. Consumption may be forgone in an individual's early years in order to permit the accumulation of capital (either financial or human) that pays high returns later on. In addition here, home ownership itself offers a mode of capital accumulation that needs to be considered to understand housing expenditure and consumption. A lifetime perspective also argues for integration of the household's time budget and income budget. For almost all households, wages and salaries are an important component of aggregate lifetime income and hence of purchasing power. At the same time, household members have to allocate time among paid work, education and training, and domestic production.

Third, the proposed framework puts an emphasis on the question of where, how, and by whom domestic production gets undertaken. In a one-person household, how does an individual allocate time among paid work, training, and domestic production? When a household consists of more than one individual, what is the nature of household governance and the household division of labor? A household of more than one person can also be thought to be a cooperative; some of its assets, for example furniture, can be thought of as a local public good shared by household members, with attendant issues of contracting. What governance structure (contracting mechanisms, either implicit or explicit) are required to ensure the household division of labor, and the efficient use of local public goods? And, for the individual, what does this imply about the desirability of alternative living arrangements: for example, living alone versus sharing accommodation?

Fourth, this framework implies that residential location is an important ingredient in domestic production. Location is important in two respects. One is that it affects distances to work and hence commuting time. Thus, a poor choice of location unduly limits the time available for domestic production. Related to this are the relationships among location, gender relations and household governance; for example, the effect that gender differences in job availability have on domestic production among husband-wife families. The other impact of location is in terms of neighborhood quality or amenity. In a choice-theoretic framework, householders develop skill in domestic production in a specific neighborhood (for example, they learn where to shop locally for various goods, and how to work with their neighbors to produce the neighborhood environment that they want); an ability that Becker calls household capital. Ideally, a household seeks out a residential location where household capital can be easily built up, and resists leaving that neighborhood later because of the household capital that would be lost.
Fifth, such a framework suggests a web of four explicit and implicit "markets" that affect housing choices. One is the market for living arrangement; a market that is generally implicit in the sense that we do not observe buyers and sellers transacting in the marketplace. Here the demander is the individual and the supplier is either that same individual (in the case of a person living alone), or a group of one or more others. A second is a market for domestic production that is also typically implicit (household is both demander and supplier). Sometimes, however, this market can also be explicit. When a household chooses condominium ownership, for example, it is also choosing typically to purchase property management, gardening, and snow removal services that might well be produced by a household itself in freehold ownership. A third is the market for housing services, including location. Here the demander is the household: a demand derived from the demand for domestic production. The supplier is the household itself in the case of home owners; hence an implicit market. In the case of rental accommodation, the supplier is the landlord, and the market is explicit. Fourth is the market for housing stock. The demander is either the household (home owners) or the landlord (rental), and the suppliers are builders, renovators, and converters. In general, this market is explicit; except in the case of self-builders and do-it-yourself renovators.

We began this section with a focus on the demand for housing. We see now that the choice-theoretic framework may also have implications, either directly or indirectly, for both supply and demand in the above markets. To complete the modeling of housing condition, we must add in a model such as of a profit maximizing firm to predict the behavior of suppliers in explicit markets: that is largely the developers of housing stock, and the landlords who supply rental housing services.

Implications for housing surveys

The data collected from housing surveys can be used in two different ways. One is broadly descriptive, wherein survey data are used to summarize a state or incidence of some housing stock or condition. The other is inferential, wherein survey data are used to evaluate a hypothesis such as arises from the choice-theoretic framework above. From a choice-theoretic framework, inference poses three methodological problems for survey designers: delineation of the choice set, explanation of the choice, and simultaneity. Suppose, for example, that we look at why some individuals are more likely to be found living in an old dwelling than are other people. We would then think that the individual we observe living in a dwelling has made a choice from among alternatives (the choice set), and that that choice reflects the consumer's income, the price of each alternative, the prices and availability of complements and substitutes, and preferences.

First, consider delineation of the choice set. Housing surveys typically record much about the dwelling currently occupied. However, we tend to know little about the alternatives open to the household, and hence about consumer choice therefrom. If the current dwelling is its choice, what is the choice set from which it was taken? In a simple view of the world, every household can choose from among all housing alternatives, subject only to the constraint of their budget. In practice however, choices are more constrained than this. For one, information is costly to collect, and the household may well find that the expected gain from further searching is smaller than the cost of searching. For another, an unobserved variable (such as wealth) may be such as to preclude a choice (for example, home ownership) from the actor's choice set.

In practice, some kinds of surveys have been more successful at identifying the choice set. Notable here are surveys of residential relocation, since they commonly include questions about the housing alternatives considered by the household when moving. In contrast, the identification of housing alternatives is less commonplace in studies that focus on living arrangements. There, we know little about the other options or coping strategies (choices) open to the individual. When we observe, for example, young singles living alone, we might like to know whether living with a parent was an option. However, we typically know nothing from housing surveys about the availability of such living arrangement options.

Second, consider explanation of the choice. Suppose we set out to test the hypothesis that consumer choice is sensitive to prices or income. When we put individuals into sample groupings and look at how housing condition varies with some causal variable (e.g., income, price, age, household size, or other characteristic), we must assume that these consumers would be otherwise similar and face the same choice set. Unless we make such an assumption, we simply cannot conclude that choice varies because of the causal variable. However, in practice, housing surveys tend to omit some variables that are evidently important in explaining housing condition. Again, missing data on wealth are just one example here.
Third, consider the issue of simultaneity. Empirical studies of living arrangement, workforce participation, schooling, and childbearing report evidence of substantial simultaneity. To cite just one study, Deaton and Muellbauer (1980: 202-205) reports on the differences in household expenditure between young British couples without children, and their peers with small children at home. They find that couples with children spend significantly more on tobacco. Why? Do children drive their parents to smoke? Perhaps. However, I suspect that a more plausible explanation is that couples with children have substantially different life course objectives, and hence choose bundles of housing and other goods different from their childless peers. In a choice-theoretic framework, this is not surprising. Individuals with different kinds of preferences will opt for different life courses, each with their own strategies for living arrangement, housing consumption, domestic production, schooling, and workforce participation. Put differently, income, workforce participation, marital status, and childbearing are not simply independent variables that determine housing condition. Instead, these variables are joint outcomes (lifestyle) that need to be modeled simultaneously.

Application to surveys of housing condition

A choice-theoretic framework has much to say about what ought to be added to surveys of housing condition like the four above. Let us return to the list of five choice-theoretic insights identified earlier in this paper.

Housing as intermediate good

The first was the notion of housing as an intermediate good in domestic production, and the role of substitutes. This implies that surveys of housing condition should look at the availability of substitutes in domestic production. Le Corbusier, for example, in his famous ville radieuse plan envisaged housing individuals in dormitories; private living rooms, dining rooms, and kitchens were unnecessary because residents would undertake domestic production within communal spaces. Communal spaces and facilities that permit domestic production are here a substitute for private housing. These could include "public" facilities that are local to the site, such as a party, hobby, crafts, exercise, or games rooms maintained by a condominium or housing cooperative, as well as community facilities that are off-site. Another example would be the provision by some employers of worksite dining, recreation, exercise, toilette, and daycare facilities; that is, the worksite "campus." Such facilities make it possible for employees to re-arrange their daily travel schedule to avoid peak congestion by undertaking some domestic production at the workplace. Private, commercial facilities nearby (e.g., restaurants and theaters) would also be important in explaining the use of housing in domestic production. In all of these cases, a choice-theoretic framework suggests that the availability of substitutes for domestic production should be measured within a survey of housing condition. However, nowhere in PUMS, SHU, FES, or HIFE is attention given to such measurement.

What should go into a survey of housing condition? We might begin by listing some activities that are commonly thought to take place within the home: that is, to underlie the demand for housing: toilette; food preparation; cleaning of house, dishes, and clothing; child rearing; entertainment; reading and education; home maintenance and repair; boarding, lodging, home office, and commercial production in home. Surveys of housing condition should then identify (1) the nature and extent of each such activity, (2) appurtenant features of the dwelling that enable or prevent such activities, and (3) the availability of facilities nearby wherein such activities might alternatively be undertaken. Surveys of housing condition might also look to activity limitations among residents that also contribute to the demand for, and adequacy of, specific features in housing (such as wheelchair access).

Lifetime perspective

Becker emphasizes the importance of looking at housing consumption from a lifetime perspective. For the most part, however, housing surveys are simply cross-sectional snapshots; providing a description of household and dwelling only as of the survey date. Snapshot surveys are not entirely useless; after all, a cross-section sample can give an idea of how housing condition varies with age or family status across a population. However, such surveys do not tell us much about how the household came to live in its present dwelling, nor about its plans for the future. At best, housing surveys tend to include retrospective questions that ask about recent changes in condition. SHU data, for example, also give a snapshot of the preceding dwelling for household heads who have moved in
the last three years. From a choice-theoretic framework, cross-sectional housing surveys should include questions about recent changes in household composition and housing condition as well as about changes expected in the near future.

A choice-theoretic framework also emphasizes the role of capital accumulation (both human and financial) in household decision-making. Among the surveys of housing condition, only FES tries to get at this: and at that consists only of a measure of net saving over the previous year. Housing surveys should query financial wealth, and the role of housing finance and/or consumption within that context. In addition, a choice-theoretic framework includes human capital accumulation: education, job training, and skill at domestic production. While all of the questionnaires include questions about formal schooling, there is little information about the acquisition of job and domestic production skills. A survey of housing condition could include some questions to identify which basic skills are possessed by the household.

A lifetime perspective also raises troubling questions about how income (and hence affordability) is measured in housing surveys. Statistics Canada measures income as factor payments in the national production of goods and services: e.g., wages and salaries, land rents, interest and dividends. However, some households choose to run up savings at some points in their life cycle, and run down savings or increase indebtedness at others. The latter receipts of money, while not factor payments, are often regarded as "income" by the recipient: e.g., a student living on a student loan, or a pensioner living on a reverse mortgage. A lifetime perspective suggests the need to measure money receipts broadly.

A choice-theoretic framework also suggests the usefulness of panel surveys of housing condition. With a panel survey, we could see how over time individuals adjust their living arrangement, domestic production and paid workforce participation, consumption of housing services, and demand for housing stock. From this, we could see how quickly individuals change their housing and/or living arrangement in response to a change in economic conditions or family status. Panel survey data also permit us to examine the simultaneity of domestic production, paid work, and living arrangement. The McElroy (1985) study of young American men illustrates the possibilities. Using the National Longitudinal Survey of Youth, McElroy looked at workforce and living arrangements of youth, taking into account the wages and workforce participation of the parent(s). The panel survey permitted McElroy to look at the parent(s) even where the young man was no longer living in the parental home.

Domestic production. Where, how, and by whom

Third, a choice-theoretic framework emphasizes the question of where, how, and by whom domestic production gets undertaken. To fully explore this question, our sampling universe must ultimately reflect the variety of living arrangement: from private dwellings (including shared accommodation) to institutional accommodation to homelessness. At present, surveys of housing condition such as SHU, FES, and HIFE are restricted to persons living in private dwellings, and hence our understanding of behavior is limited to just this sector. At the same time, a basic question of research strategy arises. Is it better to cover an entire population within a single survey, or to survey the homeless separately from institutional accommodation, and separately again from private dwellings?

In addition, all of the above-mentioned surveys assume a single regular place of residence. Surveys of housing condition should be re-oriented away from their implicit focus on regular place of residence. We might do this by asking residents where and with whom they had lived over the space of, say, the past four weeks. As a result, we might learn that Jack lives alone Monday through Friday, but visits on weekends at the home of Harvey and Muriel; Harvey and Muriel in turn report that they otherwise live alone. If we define an episode to be a period of one or more consecutive days spent in the same living arrangement (that is, living in the same set of living quarters either alone or with the same group of people). Jack would thus report eight episodes: two per week. From this sample, let us further count each distinct living arrangement. From the individual responses of Jack, Harvey, and Muriel, 24 episodes reduce to three living arrangements in two dwellings. A census, in contrast, would identify only two households and two dwellings, since it assigns every person to one regular place of residence. Further, a focus on living arrangement brings out the fact that Jack's dwelling is unoccupied two days per week, while the other dwelling contains three people on weekends. Of course, such data would not be easy to obtain. Information about who you invite into your home is at the heart of privacy, and respondents may simply be unwilling to supply such details. Nonetheless, the advantage of having such data is that it permits us to better understand the demand for, and use of, housing. Such
questions are already part of studies of homelessness. A variant has also been used in the FES (which queries changes in the spending unit over the preceding year).

How people spend their time around the home provides another indicator of domestic production. In recent years, there has been much survey work undertaken related to the estimation and interpretation of household time budgets. These have, for the most part, been divorced from surveys of housing condition. Integrating time budget surveys with surveys of housing condition would however lead to some substantial new insights. At present, we can see just how much time is spent in activities around the home, and how much is spent on activities elsewhere. Does the split between the two vary with the design and facilities present in the dwelling? Does it also depend on the availability of substitute facilities (e.g., libraries, daycare) outside the home? The majority of all households in Canada are headed by a husband-wife couple. Time budget survey estimates suggest that, in such households, domestic production is done mainly by wives. This gender inequity raises the question of whether housing condition is a contributing factor. The integration of surveys of time budget and housing condition should enable us to look at such a question. Finally, housing surveys might well consider household governance. How well does household decision-making benefit each member of the household? How does governance affect the choice of living arrangement and the individual's responsibilities for undertaking domestic production? In the same vein, housing surveys should also enquire as to the role of persons outside the household in undertaking domestic production. These are all issues on which current surveys of housing condition are silent.

Location and neighborhood

A choice-theoretic framework suggests the importance of taking a lifetime view of housing adequacy. Central here is the notion of household capital: that households learn how best to undertake domestic production within their neighborhood. Under otherwise constant conditions, a household would then have a decreasing likelihood over time of ever moving: accumulating household capital is like "putting down roots." However, housing needs may change; so may dwelling quality, and neighborhood environment. The tradeoff for an individual is the mismatch between changed housing need on the one hand and the potential loss of household capital and other costs of moving on the other hand. Bartik (1986) emphasizes this idea. A survey of housing condition should provide data suitable for evaluating such a choice. What kinds of transactions does the household engage in within the neighborhood, versus outside the neighborhood? How easily could the household make these transactions if it moves to a new neighborhood? At the same time, it may be possible for a household to stay in one place and renovate its housing to suit its changed needs. A survey of housing condition should provide data suitable for evaluating this choice as well; it might here enquire as to the ease of conversion or modification.

Web of markets

A choice-theoretic framework emphasizes the need to look at housing condition broadly within the context of an individual's life course strategy. Such a framework argues for the idea that a survey of housing condition should identify choices, choice sets, and their determinants across the four "markets" identified in this paper: living arrangement, domestic production, housing service, and housing stock. In each case, the survey can help to identify the coping strategies open to individuals, and the factors that shape choice from among these. However, this is not just a case of doing four separate analyses, one for each market, from a common set of survey data. Rather, a choice-theoretic framework suggests an inevitable simultaneity among these four markets which means a common survey and joint modeling are required to better understand how choices are made within each market.

Conclusion

The use of large-scale housing surveys has mushroomed in the past few decades. From modest beginnings in the Census and in small-scale surveys, these large-scale surveys have developed into comprehensive attempts to describe housing stock and/or housing condition. Over the years, surveyors have added new questions, and deleted outmoded ones, but the focus of such surveys has remained around the composition of the household, the characteristics of the dwelling, and match between the two (e.g., affordability, crowdedness). Much has been learned as a result of such surveys.
It is the contention of this paper, however, that the design of such surveys has evolved into a state today of diminishing marginal returns. This is not to say that there are not still important questions to address using large-scale surveys. There are! I argue above, however, that to answer important new questions, we need to reinvent the large-scale survey. A choice-theoretic framework is important in this regard because it helps us to see how to create a new breed of survey; one that integrates queries into time budgets, consumer expenditure, home use, social networks, human and financial capital accounting, neighborhood situation, and household governance.

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