

National Information Systems for Decision Making in Housing & Mortgage Finance

John L. Goodman, Jr

One of the common complaints of decision makers in business and in government is "We need more information." The housing and mortgage finance industries are no different from others in this regard. But information is expensive, and before business or government invests in its collection, it is prudent to systematically assess the specific needs and the alternative methods available to acquire the information.

This article describes the kinds of data about housing and mortgage markets, and the uses of these data. The goal is to establish a framework and checklist that will help professionals in industry, finance, and

John L. Goodman, Jr is Senior Economist, Board of Governors of the Federal Reserve System, Washington D.C., USA. This paper is based on a presentation to government officials and business persons in Mexico City, February 4, 1992. The presentation was sponsored by the World Bank and hosted by the Fondo de Operaciones y Financiamiento Bancario a la Vivienda (FOVI), the special housing fund of the Bank of Mexico. Opinions expressed are those of the author and do not necessarily represent those of the World Bank or the Board of Governors of the Federal Reserve System.

government reach decisions about data collection and dissemination. The immediate motivation is the continued expansion of the housing and financial sectors in the economies of many developing countries, and current restructuring of the economies of Eastern Europe and the former Soviet Union.

Much of what is in this article is common sense. But just as the pre-flight checklist is standard practice for airline pilots, so can a systematic review of issues and options in data system development minimize the chance of inadvertent and costly, if obvious, mistakes.

The examples I use come from the U.S. This paper is, in part, a case study of the housing and mortgage information system in the U.S. The institutional specifics will vary from country to country, but the basic principles should be transferable to other places and, perhaps, to subjects other than housing and mortgage finance.

The subsequent sections of the paper discuss in turn: the types of information on housing and mortgage lending, the users of those data and their information needs, technical issues regarding the design and collection of housing and mortgage data, institutional division of responsibility for data collection and processing, and marketing the information.

I. THE TYPES OF INFORMATION ON HOUSING AND MORTGAGE MARKETS

We begin with a brief description of key quantitative and qualitative indicators of housing and mortgage market conditions.

A. Housing

Some questions about housing regard the flow, while others refer to the stock.

The Flow of Housing

In monitoring additions to the stock of housing, newly built units can be measured at different times. In jurisdictions where building permits are required, permit issuance can be the first indicator of construction. Housing starts (measured in the U.S. as the date on which the structures foundation is first laid or excavated) are themselves a leading indicator of construction spending, because value is added throughout the construction period, which can last years. Alternatively, construction can be measured as of the completion date; for analyses of housing availability, completion is the milestone that matters.

Housing activity can be measured in number of units or in terms of cost or price. Units can themselves be counted as structures or as individual living units. Emphasis in the U.S. is on the latter, and a housing unit is defined as a house, apartment, or room intended as separate living quarters; a household is defined as the person or group of persons

occupying a housing unit.

Data on value of construction put in place - based on field surveys of projects underway - provide the best information in terms of timing of expenditures on newly built housing. But these data are difficult and expensive to collect. A reasonable alternative is to estimate the cost to completion of projects at the time they are started. This approach makes the most sense in housing markets where the time of construction is short.

Additions to the stock can occur through expansion or other improvements to existing structures, as well as through conversions of existing structures from non-residential uses. In some economies, especially those with slow population growth, these additions can be a substantial part of all construction. In recent years, these conversions have represented about 10 percent of the growth in the number of housing units in the U.S. Improvements to existing structures have accounted for about 25 percent of all residential construction spending.

The standard definition of a housing start does not fit all forms of construction. Mobile homes are an example, because by definition they have no permanent foundation. Mobile homes, which account for about 2 percent of construction spending in the U.S., are "booked" in the national economic accounts when the units are shipped from the factory.

Separate from activity involving flows of units into and out of the stock are questions about the flow of units within the stock: how many existing units turnover during a time period, either through resale or through rental to new occupants. Information on transactions prices and rents from these turnovers gives direct information on current market conditions.

The Stock of Housing

Information on the stock of housing provides a snapshot of conditions as of a point in time. Information on the number and char-

acteristics of housing units is often collected as part of a population census. This feature is particularly useful for matching characteristics of the population with the characteristics of their housing. Because censuses typically are conducted only every 5 or 10 years, and because the housing data collected are often rudimentary, it is sometimes necessary to conduct special surveys of housing conditions, which may be restricted to areas of the country or segment of the population (e.g., owners or renters).

B. Housing Finance

Housing is typically a long-lived asset with high value relative to average household incomes. For this reason, the financing of housing construction and purchase is integral to the operation of the housing market. Similarly, the performance of the market for residential credit is dependent on housing market developments. Another linkage is between housing credit and overall financial market performance. In the U.S., residential credit accounts for about 25 percent of all the credit outstanding to governments, business, and households.

The Flow of Housing Credit

As with housing, residential lending can be measured as both a flow and a stock. The flow of new credit is simply the stream of new loans. The volume of these loans can be measured in number of contracts or their aggregate value. Financial institutions have these data for their own internal purposes; in the U.S., institutions with federal insurance provide these on standardized quarterly reports.

Characteristics of the loans made that are most important are:

- the term or maturity (if stated at the outset);
- the initial interest rate on that loan;
- any additional financing costs "points" paid at the outset of the loan;

- the specifics of indexes and formulas for adjusting either the contract interest rate or the loan balance during the life of the loan;
- the amount of the loan as a percentage of the price or value of the housing being purchased;
- whether the loan is a first or a second lien; and
- the type of collateral behind the loan (i.e., structure type).

Housing credit is added to the stock through newly originated loans. The stock of credit shrinks over time through scheduled amortizations of loans outstanding or through loan defaults, which result in writedowns or chargeoffs on the financial statements of lenders. It can be important to be able to measure this outflow and distinguish it from trends in new originations as a source of change to the stock of credit.

The Stock of Housing Credit

The important characteristics of the stock of mortgage credit are similar to the characteristics of the flow, but with some modifications and additions.

Terms on the stock of loans at a point in time can be difficult to ascertain, because some loans change their terms over the course of the loan, and these changes can be difficult to monitor without tracking individual credits. Why do we care about these terms? Regardless of the initial terms, the effects of loans on the current performance of financial institutions and the current financial position of the borrowers depend on the current interest rates and required loan payments.

Credit quality is a key aspect of loan performance. The incidence of delinquencies, defaults, foreclosures, and recoveries on loans outstanding all have implications for loan underwriting and pricing.

Linkages Between Housing and Mortgage Data

In some countries, one of the biggest housing problems is housing affordability, rank-

ing above housing and neighborhood quality and overcrowding. While building codes and zoning ordinances may "force" households to occupy safe and sanitary housing, the costs of that housing relative to incomes may be excessive, requiring households to allocate most of their income to housing, partly at the expense of other necessities. In these situations, a source of data is required that combines information on occupant characteristics (including income), physical housing characteristics, and housing costs.

Information on mortgage financing is more readily obtained for owner-occupied units. Household surveys can be used to inquire of owners the terms of their mortgages. But renters normally are unaware of the owner's financing, and the property owners need to be contacted, adding to the complexity of the survey operation.

Attitudes and Opinions of Builders, Lenders, and Consumers

As a complement to "hard" data on housing units and financing, the attitudes and opinions of market participants can provide an indication of current market conditions. These surveys, which are being relied on more and more in the U.S., have two advantages. First, they are inexpensive to field relative to data collection that involves record keeping (because respondents do not need to collect or refer to data before answering the questions). Second, responses can be tabulated and disseminated quickly - within a matter of days, as opposed to the months or even years required to process other data.

These opinion surveys are particularly useful for high-frequency monitoring of changes in market conditions. While it may be difficult to read much into responses from a single fielding of a survey ("Of builders contacted this month, 48 percent said demand was good"), changes from one survey to the next can be revealing ("The proportion of builders reporting good demand increased to 63 percent this month from 48 percent a month earlier").

C. Technology and Regulation

While not *data per se*, information on technological developments in housing and finance can promote efficient decision making to the same degree. Examples include new developments in construction materials and methods, and new designs for mortgage contracts, and the investment characteristics and performance of those loans.

Similarly, prompt, accurate dissemination of information about government regulation of housing and finance promotes efficient decision-making within the specified regulatory regime. Uncertainty about permissible activities can delay decision making or cause unauthorized activities, which may have to be undone later at a significant cost.

II. THE MARKET FOR HOUSING/ MORTGAGE INFORMATION: WHO ARE THE USERS?

There are many users of information on housing and mortgage markets, and their needs are diverse.

A. Uses by Governments

In the national government, macroeconomic policy - both monetary and fiscal - has a critical need for data on the flow and stock of housing. Because housing is typically one of the most interest-rate sensitive sectors of the economy, monetary policy officials tend to keep a closer eye on the sector than its share of GDP would otherwise warrant. While geographic detail in housing data is not important for monetary policy (because monetary policy is national, not regional), frequency of observation is important. One observation per year, for example, would probably be inadequate for monitoring.

Fiscal policy formulation needs information

on both new construction and on the stock of housing. Construction data are needed for monitoring the macroeconomic reactions to changes in fiscal stimulus, whereas evaluation of changes to tax policy affecting existing housing needs a data base on which the revenue results can be simulated.

In the mortgage market, national governments need data on terms and performance of credits in order to monitor the safety and soundness of regulated or insured institutions.

Governments at the regional and local level need information on the stock of housing within their jurisdiction for a variety of local and regional planning purposes. The needs for geographic detail are far greater for local governments. At all levels of government, stock data more than flow data tend to be used for long-run planning and for program design and budgeting.

In the U.S., many of the public policy uses of housing and mortgage data have been met, at least those that do not require detailed geographic identification. Macroeconomic monitoring is facilitated by a host of high frequency statistics on housing construction, and the bi-annual *American Housing Survey* provides a periodic, detailed snapshot of the condition of the housing stock and the characteristics of its occupants. Ongoing collection of balance sheets and income statements from financial institutions assures fairly complete coverage of lending patterns. New regulatory needs for data, often mandated by the Congress, lead to new data collections.

These data as a group, meet the federal government's basic, recurring needs for macroeconomic policy setting and for analyses of the incidence of tax proposals and housing assistance programs. Other one-time information needs that cannot be met from the regular data sources are often met through special surveys; recent U.S. examples include (1) counts of the homeless population and (2) the volume of maturing commercial real estate debt. Federal program evaluations too generate special-

ized data sets designed to answer specific questions.

Local governments' data needs are less well met in the U.S. In many jurisdictions the decennial Census is the only source of data on the characteristics of housing and its occupants. The greater the geographic detail, the less accurate can the Census data become over time, because characteristics of small areas can change more rapidly than can those of the nation overall. The Census data themselves are not available for small neighborhood-level geographic areas for more than two years after the Census date.

Furthermore, those programs of the federal government that require comparable, up-to-date housing statistics for local jurisdictions are particularly at a loss. Allocations of federal funds by formulas require not only current data but *comparable* current data for all jurisdictions. Local officials may have a good "feel" for the local market and therefore not need hard data for some purposes. But intuition can be wrong and needs periodic validation.

B. Private Sector Data Users

Because both demand and supply in real estate markets is inherently local, national and even regional data on stocks, flows, and prices are largely irrelevant for many private sector market participants. Comparability of data across local markets is similarly irrelevant for most market participants. Furthermore, because most suppliers and consumers are small relative to the size of the market, price is a given and a sufficient statistic for most decision making.

Builders who speculate - beginning construction without a signed sales contract - have more extensive information needs. These firms need to forecast what market conditions will be when their project is ready.

Many building firms in the U.S. do little formal market research. A recent survey of home builders found that most builders keep an eye on the production of new

homes in their area, new home absorption rates, and sales of existing homes.¹ But only about half of the respondents reported regularly engaging in market research prior to construction in order to gauge the demand for particular features and amenities. It may be the case that small firms, in particular, need technical and regulatory information more than they need market information.

Unlike smaller companies, larger firms operating nationwide have information needs closer to those of the national government. Production planning and market entry decisions require forecasting at both the national level and for specific markets. Likewise, large suppliers of input factors need to know how much housing is being built or sold, and where the activity is occurring, in order to plan their own production and marketing.

The needs of financial institutions that lend funds are somewhat different from those of suppliers who make equity investments. Most importantly, these lenders need information on repayment performance of comparable loans in order to set their own pricing and underwriting standards. The lending institution's best information probably comes from its own previous experience. But information on marketwide performance also is applicable. These financial institutions also need reliable indexes of market conditions (especially wages, prices, and interest rates) if loan payments are to be tied to these variables.

On the demand side of the housing market, consumers and investors need to know what kinds of housing are available and at what price. Housing suppliers find it advantageous to advertise, because the gains from the advertising accrue to them; unlike other aspects of the information markets for housing, there are no significant externalities.

As in any asset market, traders who buy or sell existing housing need information on

current transactions. Information increases the efficiency of the market, reducing spreads between bid and ask prices, and simultaneously increasing the value of properties for existing owners while reducing the required purchase price to prospective buyers.

Finally, market analysts need data before they can analyze. These analysts - whether evaluating equities issued by building firms or the credit characteristics of a company's debt - need information on market conditions, as do those academics undertaking "basic" research at universities or private research institutions.

Regarding the adequacy of information for decision makers in the private sector, in the U.S., the available information on prices, rents, and factor costs is sufficient for many market participants. This information is either in the public domain or available, for a fee, from private sources. While everyone would like more accurate forecasts of future market conditions, data limitations are not the constraint on improved accuracy. Technical and regulatory information is in some instances harder to come by than are market data, despite efforts of trade associations and governments at all levels to provide it.

III. DESIGN ISSUES FOR DATA COLLECTION

The uses to which housing and mortgage data are put define the characteristics those data need possess. The most important of these design issues involve geographic specificity, statistical accuracy, frequency of observation, and scope of subject matter.

A. Geography

In any data collection for housing, a key question is geographic specificity. As mentioned earlier, monetary and fiscal policy have little need for sub-national data, although federal programs that allocate assistance based on local conditions do require comparable and current local area data. In the private sector, by contrast,

decision making requires a high degree of geographic precision in evaluating market conditions. Knowledge of national or regional market conditions usually will be of little value for deciding whether to buy, sell, rent, or lend money on a specific property.

In housing finance, geographic detail on mortgage loans in the U.S. typically refers to the location of the lender rather than the location of the property, although some financial institutions are required by law to disclose the neighborhoods in which they are making home mortgages. This distinction between location of lender and location of property calls for caution in interpreting loan performance statistics. Because a mortgage lender with headquarters in a local area experiences loan repayment problems does not necessarily mean that real estate market conditions in that local area are depressed.

Geographic specificity has substantial implications for the costs of data collection. The smaller and more numerous the geographic subdivisions for which data are required, the larger will be the sample size required to achieve a specified level of statistical accuracy for those individual areas.

B. Statistical Accuracy

Accuracy is itself a key parameter in designing information systems. Accuracy, like geographic specificity, is expensive. Sampling error minimization requires large samples, which cost money. Minimization of non-sampling error also requires care and staffing to avoid procedural or clerical errors.

The required degree of accuracy depends on the purpose for which the data or other information are being collected. In general, the less is known about the subject under study, the less precise does the initial data collection need to be in order to provide a sufficient basis for improved decision making.

C. Frequency

Another key design element is the frequency of the data collection. Because the stock of housing and mortgage credit changes only slowly, high frequency observations on the stock are probably unnecessary, unless direct measurement of the flow is impractical. If direct measurement is not feasible, then changes in the stock can serve as a proxy. For example, if direct measurement of the volume of newly originated mortgage loans is not collected, then first differences of estimates of the stock of mortgage debt provide a proxy. The proxy is imperfect, however, because net change in mortgage debt also depends on repayments on existing loans, loan sales, and chargeoffs of bad debts. In situations where the flow is a small proportion of the stock (for example, monthly or quarterly housing starts), it will usually be more economical, and more accurate, to collect data on the flow directly.

High frequency data will not be economical if processing lags delay its availability. Monthly data that takes six months to process is of little more value to decision makers than are quarterly data. In some instances, the best use of funds could be to accelerate the processing of data.

One additional contributing argument for high frequency data is that it can improve accuracy. Respondents' recall problems are minimized, and field procedures become routinized for the data collectors.

D. Scope

The last design issue has to do with the scope of data collection. Both multipurpose data collections and more targeted, narrowly defined efforts have their place. One danger of multipurpose surveys is that they sometimes can attempt to be all things for all users, with the result that no one data user's needs are adequately met. While multipurpose surveys are useful for general market monitoring, these surveys are particularly

ill-suited for monitoring rare events. For this purpose a specialized questionnaire and a customized, focused sampling plan will be required. Specialized data collections also will prove more effective for program evaluation, which will often be geographically targeted as well as focused on a particular group in the population.

IV. WHO SHOULD COLLECT THE DATA?

Discussions of data collection invariably turn to the government's role. Government agencies commonly are looked to for the data collection or, at least, for its funding. This approach is understandable, in part because data collection for housing is a product for which market failure is endemic.

A. Market Failure and Housing/Mortgage Information

Housing and mortgage market information fits the textbook definition of market failure. The first attribute of this information is non-rival consumption. For most purposes, especially public policy purposes, one consumer's use of the data does not detract from another person or group's use of the data. By contrast, in the private sector, market intelligence can give one firm a competitive advantage over another. But even in the private sector, information can facilitate market efficiency.

Another attribute that complicates the private market's provision of housing and financial data is non-excludability. It can be difficult for data providers to maintain the confidentiality of their product, especially in the age of photocopying. Users of the information can gain access without necessarily paying for it. If beneficiaries do not pay for the service, it will be under-provided relative to the social optimum.

Even in situations where market failure is clear, complete takeover of data collection by government may not be required. Partial subsidies to private sector providers who then gain some of their revenues from their

paying customers and some from the government can be sufficient to increase the provision and dissemination of information to the economically optimal level.

At the extreme, there is no feasible way to collect revenues that appreciably defray the cost of data collection. An upper bound on the chargeable fee might in practice be the per-page cost of photocopy. Attempts to charge a higher price would result in proliferation of pirated copies.

Situations in which the government is the only consumer of information are *not* instances of market failure. Governments have some specialized needs for data for program operations for which there may be few other applications. In these situations the government happens to be the customer, but it could just as easily be a data item for which only one private sector company had a need. In this situation, for the government as for a private company, the question is whether the perceived benefit to be derived from the information exceeds the cost of collecting it.

Even if government - either national or local - has to take the lead in providing information, government does not necessarily have to staff and operate the activity. Government can contract these functions out to private businesses, which may be more efficient than the government at providing the information. Only when issues of confidentiality or quality control give government a decisive advantage at data collection does government production of information - as opposed to government provision of information - become necessary.

If government must take the lead, the next question is "What government agency should be in charge?" The answer rests on three considerations: self-interest, absolute or comparative advantage, and institutional tradition. Obviously, government agencies with the most direct and immediate need for information are the most likely to take the initiative and to follow through with collection of that information. But the agency with the need for the information may not be the best

suited in terms of staff, expertise, or facilities to collect the information. Specialized statistical agencies, including census bureaus, may be the best suited for the enterprise, with their expenses defrayed through an inter-governmental transfer from the budget of the agency in need of the data. Third, tradition can play a role in the allocation of responsibilities among government agencies. If one office has always had the lead in similar undertakings, it may make sense for that agency to continue unless there are clear efficiency arguments to the contrary.

B. Private Sector Data Providers

Businesses in the U.S. generate and disseminate data through three different channels. The first of these is the stand-alone data firm. This is a company whose main line of business is providing data and analysis through standardized materials and custom-designed products. One of the functions of these firms is to make government-generated data more accessible to potential users. This enhancement occurs through re-packaging of, for example, raw Census results - converting data from large machine-readable files into print or microcomputer disks.

Trade associations - organizations representing an industry and supported by firms in the industry - are a second channel in the private sector for disseminating data and information. The real estate trade associations in the U.S. all have significant research offices that serve like private data companies for the association members. The purposes of these associations are to provide information to their members and to promote their industry in public policy debates and legislation.

In addition to making government generated data more accessible, and analyzing it, these trade associations also collect and publish information of their own. Examples in the U.S. include monthly sales of existing

homes (National Association of Realtors), builders' assessments of current market conditions (National Association of Home Builders), and delinquency rates on home mortgages by location of the property (Mortgage Bankers Association of America). Trade associations often have superior access to their members, and are more familiar with the subject matter, and thus are better able to collect data than are private data firms. Trade associations also may have better access than do government data collectors, unless responses are required by law, as they are for some censuses and surveys in the U.S.

Why do U.S. trade associations enter the business of data collection? The reasons vary. Keeping their industry in the news is one purpose, in order to demonstrate its importance to the U.S. economy. Also, there is the motivation to meet the needs of its members, who for reasons of market failure may not have the information they need available to them through regular private sources.

The third and final private sector channel consists of private firms generate and market data as a by-product of their other operations. A U.S. example is the calculation of vacancy rates for commercial real estate, by property type and metropolitan location, by commercial real estate development/management firms. Another example is real estate market research done by Wall Street investment banks.

These firms tend to provide these estimates free of charge for their clients, but non-clients tend to benefit as well through paid or free subscriptions.

V. MARKETING THE DATA TO DECISION MAKERS

Data are of no value if they do not reach the potential users. Data dissemination is an exercise in marketing. One strategic issue is the medium for the information. Paper is of course the most common, but other forms are possible and are becoming increasingly

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³ The World Bank, Housing Sector Policy Paper (World Bank May 1975)

⁴ Ibid., 41, 48-49

⁵ This approach stressed the need to mobilise all the resources of all the actors in the shelter production and improvement process. The approach emphasised that decision making would be left to people themselves to determine the priorities, the pace and the extent of the development process.

⁶ Especially laws dealing with price controls - land prices, rent, interest rates - property rights, transfer of ownership and collateral instruments.

⁷ For example, public sector institutions might wish to review their role as builders of housing units and transform themselves into providers of serviced land instead.

⁸ Especially high and rising levels of inflation, volatile interest rates, stagnating income, increasing indebtedness and declining terms of trade were the key factors.

⁹ The World Bank is reviewing its own shelter strategy in the light of past experience and is likely to publish a position paper shortly. It has already reviewed its Urban Strategy and has published its approach in *Urban Policy and Economic Development*, World Bank Policy Paper, 1991.

USAID has issued its own approach in *Urban Economics and National Development*, prepared by George E. Peterson, G. Thomas Kingsley and Jeffrey P. Telgarsky of the Urban Institute in Washington D.C. for the Office of Housing and Urban Programmes, U.S. Agency for International Development, Washington D.C. UNDP issued a strategy paper entitled, *Cities, People & Poverty: Urban Development Co-operation for the 1990s*, UNDP, 1991.

¹⁰ Steve Mayo, *Housing Policy and Housing Research: The View from the World Bank*,

Housing Finance International, December 1991.

¹¹ *Sites and Services - and Subsidies: The Economics of Low-Cost Housing in Developing Countries*, The World Bank Economic Review, Vol 1 No.2 1987, (301 - 335).

¹² Robert Buckley, *The World Bank & Housing Finance: Its Role in Financial Reform*, Housing Finance International Vol V No.3 (March 1991).

¹³ For a more detailed discussion of this aspect see James Christian, *Integrating Housing Finance into the National Finance Systems of Developing Countries - (Part I)* in Housing Finance International, Vol V No.4 (June 1991).

¹⁴ Judith A. Hermanson and Richard T. Owens, *The Informal Sector in Housing and Urban Development: A Review and a Road Map*, Co-operative Housing Foundation, Prepared for USAID (March 1990).

¹⁵ Harold O. Wilson, *Informal Shelter Finance: An Enabling Strategy in Action*, Housing Finance International Vol VI, No.2 (December 1991)

¹⁶ *The Grameen Bank Housing Loan Project*, Mimar 34 (March 1990)

¹⁷ See the *Asian Coalition Newsletter*, June 1992.

INFORMATION...



prevalent. Computer-readable data files of various designs are also appearing, not only accessible by large scale data processing facilities but also by individual analysts with access only to microcomputers. Some needs for information are relatively straightforward and can be handled by a telephone conversation or through simple correspondence.

Design of data products, especially printed

products, needs to occur in consultation with the users. Much bulk can be generated in thick volumes of tabulations that do not provide the required cross tabulations.

Pricing of data products is another strategic question. Private vendors of data will set prices so as to maximize their returns - not necessarily the profit on an individual data product, but in such a way as to maximize the overall long-run return to the firm - which may involve using data dissemination as a marketing tool for other products and services of the firm.

Pricing strategies for government dissemination of data differ from those of private providers. Because of the externalities and market failure aspects of data production mentioned above, government subsidies to private firms for provision of data may be justifiable. For data disseminated by the government, the optimal charge may be one that covers only the marginal cost of additional copies of reports or other data products. Charging more, in an attempt to match the average cost of collecting and disseminating the data, may only push some customers out of the market and cause others to procure illegal copies, which will be available at approximately the marginal cost of reproduction. Some charge is probably warranted, however, to screen frivolous requests.

Information systems can always be expanded. But expansion does not necessarily bring improvement. The key is to begin with the questions that need to be answered and then to work backward to determine and implement the most efficient methods for generating and disseminating the information needed to answer those questions.

NOTES

¹ Ashok Chaluvadi, "How Builders Study Their Markets," Housing Economics, National Association of Home Builders, December 1991.