THE POTENTIAL FOR FILTERING AS PUBLIC POLICY

Michael Smith-Heimer

Abstract

The paper reviews the potential role of housing filtering to provide long-term improvements in housing for the poor. It reviews alternative definitions of filtering in the literature, and speculates on market imperfections which may decrease the effectiveness of filtering in meeting the needs of specific households. Finally, it briefly describes alternative public policy techniques to maximize the benefits of filtering for low-income families.

The Concept of Filtering

> *. . . filtering in its broadest sense is the dynamic aspect of the housing market, the one aspect about which we know so little and must know so much if we are to have effective housing and urban renewal programs.* William Grigsby (1963: 85)

The concept of filtering is a key ingredient of American housing policy for the poor (Aaron 1972). The use of new construction, an indirect housing subsidy to upper-income households, to meet the needs of low-income families remains a pivotal mechanism for increasing housing quality for all income categories. Recent arguments have emerged citing the success of the filtering process during the past decades (Weicher 1987; President's Commission on Housing 1985: 35), though detractors still exist (Fossett and Orfield 1987). Since federal policy has implied that filtering is a vehicle for meeting the needs of lower-income households, the concept has major relevance for the social welfare of poor people.

Filtering lies at the heart of housing economics; it reflects the guiding dynamics of the housing market, integrating market reactions in price, quantity, quality, and investment to shifts in the supply and demand for housing units. Generally, filtering refers to the dynamics of an exogenous shift (i.e. changes in income, shift in taste or technology, or shift in costs) rippling through the housing economy through a series of moves by affected populations.

A brief illustration serves to highlight the general principal of the filtering process. Assume incomes rise at the top of the income spectrum. The high-income household desires to increase housing consumption. This, in turn, creates the demand for new construction of higher quality. The family moves into the new unit, leaving the old unit

vacant. This vacant unit increases the supply of housing in this quality range, creating excess quantity over demand. The price declines, permitting a family with lower income to occupy the higher-quality unit. They, in turn, vacate a unit of next-highest quality. This process continues throughout the quality ranges of housing, with lowest-income families increasing the quality of their new unit, with their old unit (the lowest quality) dropping from the market. In this example, all households have increased the quality of housing consumed at the same, or reduced, cost. The adjustment of households to an initial exogenous change (in this case, income), through shifts in price, quantity, and or quality, reflects the workings of the filtering process.

Alternative Operational Definitions of Filtering

While there is general agreement on the concept of filtering, several operational definitions of the concept are evident in the literature. Alternative definitions of filtering have focused on specific aspects of the filtering process, including changes in occupancy (Ratcliff 1949; Lansing et al. 1969; White 1971), changes in unit value (Lowry 1960; Fisher and Winnick 1951; Grigsby 1963; Olsen 1969), changes in the desirability of aging stock (Muth 1973; Grebler 1953), or price declines for constant-quality units (Weicher and Thibodeau 1988; Sweeney 1974; Ohls 1975; Braid 1984). Each reflects a specific dimension of filtering dynamics.

The nuances of these definitions are critical. For instance, Lowry and Olsen both argue that unit prices would adjust through reductions in maintenance expenditures, implying that the downward movement of a unit would be accompanied by disinvestment until unit quality matches unit price. Thus, units pass through the market as a by-product of the variations in investment or disinvestment aimed at maintaining "constant economic return." More recent models, especially Weicher and Thibodeau, Sweeney, and Braid, have examined the impact of construction on the price of constant-quality housing, hypothesizing real price decreases for constant quality, thus implying permanent gains.

The outcome of filtering depends on the mechanics of reaching equilibrium prices and quantities in the long run. If, as Lowry or Olsen hypothesize, owners fully adjust their maintenance behavior to reflect price changes, individual units will shift through various income categories. If unit quality declines more slowly than rent levels, quality will increase relative to price. This would lead to real improvements in housing services, albeit transitory. As owners fully adjust behavior, the unit quality in each submarket will drift back to equilibrium. In this view, improvement in housing conditions for the poor would necessitate a constant stream of units reaching the poor (presumably through new

construction in other market segments), in order to outpace the decline in unit condition caused by owner disinvestment.

The length of lag between an owner or renter's action and physical stock response is critical. A government policy that depends on filtering to upgrade the quality of housing for low-income households must assure that units are not on a freefall through the housing market, or assure that a steady stream of units are available for filtering to counteract unit losses due to disinvestment. As Lowry acknowledges, the decrease in unit quality will result from lack of maintenance, which reduces structure quality over time; unless construction levels permit continued infusion of additional units, the housing quality for the poor will eventually return to previous lower levels as disinvestment takes its toll over the long run. Weicher (1981) has suggested long lags are necessary to eliminate the gain in quality, since deferred maintenance by the owner does not immediately result in unit quality declines.

Potential Constraints to Filtering

The theory of filtering rests on the assumption of economic actors behaving rationally in a freely functioning marketplace (primarily by reacting to the potential utility gains through moving to upgrade quality or quantity). There are, however, several market phenomena which could impact the filtering process. Filtering rests on the assumption that no significant barriers exist to skew household consumption patterns. If access is denied to certain individuals, the improvements offered by filtering will not benefit everyone evenly. For instance, if a class of individuals are denied access to all quality categories or are charged greater prices for equivalent units, they will suffer from the discrimination; the filtering process may function, but to their detriment. Federal policy based on filtering in the presence of discrimination would thus discriminate against some citizens.

In practice, the American housing market is characterized by significant racial barriers, both economic and spatial. Efficient filtering is hampered and disinvestment patterns may be predicated on non-economic criteria (Fossett and Olfield 1987). In particular, as several researchers have demonstrated (Little 1976; Elliott et al. 1985), dramatic shifts in a landlord's investment pattern in housing may accompany racial change. Furthermore, as several authors have observed (Kain and Quigley 1975; Daniels 1975; Rapkin 1973), this discrimination may extend to differential pricing, raising the cost of constant quality to black consumers, significantly reducing the benefits of the filtering process.

Moreover, to the degree that owner reactions to the filtering process creates or exacerbates disinvestment cycles, it may accelerate quality declines in low-income rental housing submarkets. For instance, if

owners anticipate a downward filtering, they may elect to disinvest or change patterns of investment, impacting submarket quality (Elliott et al. 1985).

Filtering assumes that producers are price-takers, with rents set by interaction in the market. However, some evidence indicates that rental owners may not fully incorporate price reductions in the face of reduced demand, but instead may maintain price/quality relationships in the short run, absorbing value reductions through increased vacancies (Rydell 1979). Further, as Lowry indicates, landlords may have minimum reservation prices to offer a unit in the market place. If the cost push of operating expenses limits the ability of landlords to reduce rents below low-income resident payment threshold levels, the price may exceed affordable rents for low-income residents. Moreover, in the face of declining demand, the landlord may require that both fixed and variable costs be covered in order to continue rental operations, recognizing that rents are no longer covering total cash outlays. Since abandonment may be a real economic alternative, the minimum reservation price for a unit may be significantly above variable price inputs. Thus, unit rental prices may remain above those based on demand levels in the marketplace, especially at the bottom of the market (Weicher acknowledges that the sketchy evidence that exists supports the proposition that losses are correlated to abandonment).

The filtering process assumes that units are not intercepted on their downward drift. Major migration can offset the creation of units. If significant in-migration occurs at income categories below the initial filtering-unit category, production will filter no further than the income levels of migrants. Any increased demand which would have been met by construction could instead be satisfied by units filtering downward, but stopping in the particular housing submarket, with no additional shifts at quality levels below it. Admittedly, this chain leads back to the migrant's prior location; within this market the chain would continue. However, in markets with high in-migration, growth could significantly dampen benefits gained by filtering.

Another critical assumption of filtering is that units are sufficiently malleable to meet the needs of households within the filtering chain. In a certain sense this is always true; units can be subdivided or combined to create alternative combinations. However, if physical housing needs differ dramatically by income group or household status (e.g., large families or handicapped), units may arrive at an income level which cannot support the cost of modification. For instance, if a single-person household vacates a studio apartment, it may be neither financially or physically feasible to modify the unit for occupancy by a family. While the cost of subdividing units may be warranted by the additional income

gained by higher densities, the reverse may not be true. Appropriately configured units would be unavailable for the family.

Finally, while filtering can accommodate the bidding of households within adjacent segments of the market, it is an ineffective vehicle to address the needs of those near the bottom of the market. For instance, suppose that an upgrade in quality causes unit demolitions at the bottom of the market. At a future point, in-migration of low-income households pushes low-quality demand up; prices will be bid up. Unless units previously exiting the market have been saved, the lowest-income households will be unable to compete for shelter without increasing price or decreasing quality or quantity (since lower quality is unavailable). Further, given building and occupancy codes, the option of retrieving the old unit may not be feasible. The household will be forced to increase payments, or reduce quantity or quality. A price increase will ensue throughout the bottom of the market, awaiting newly created vacancies to absorb the demand. However, this signal will be an extremely weak message to the market. While several authors hypothesize that construction would ensue (Edel 1973; Ohls 1975), the rationale for assuming that additional demand based solely on low-income households would result in additional construction in the short run is not clear; the lag prior to response could be extremely long.

Filtering and the American Housing Market During the Past Three Decades

It is not contestable that higher-quality units filtered to the poor during the 1960s and 1970s. This filtering was enhanced by the record levels of production throughout the period; housing starts exceeded net household formation by more than 660,000 units annually (Stegman 1977). The growth of the suburban housing supply accentuated the short-term gains, as higher-income families exited cities, vacating higher-quality units in the central city for succeedingly lower-income categories to occupy. In this environment, substantial short-term benefits were obtained by the filtering of units. Indeed, the construction rates may have permitted a massive improvement in housing quality for the poor with only modest increases in costs.

As units became available for the poor, the pace of substandard-stock occupancy declined, evidenced by the dramatic decrease in substandard housing during the period. Dilapidated units decreased from 35 percent of the nation's housing stock in 1950 to approximately 8 percent by 1980 (President's Commission on Housing 1982: 7).

Unfortunately, the rapid growth also exacerbated disinvestment in the central city, as the increasing supply reduced the return on investment for units. As well-to-do families vacated units, rapid suburbaniza-

tion and racial discrimination both acted to depress inner-city demand, accentuating the decline in price. Population decline in most central cities further weakened housing markets. These major shifts may have caused a disinvestment spiral leading to an increase in stock deterioration and removal (Stegman 1977). Some evidence on unit condition in central cities supports this.

Moreover, while weak demand generally permitted substandard units to be filtered out of the housing market, it did not assure that the units were removed from the standing stock. It has been estimated that almost 4 million units are vacant *and* unsuitable for occupancy, fully two-thirds of the vacant units in the country (President's Commission on Housing 1982). Removal of units no longer providing housing services has not proceeded at the same pace as unit additions, with a standing stock of abandoned units creating further neighborhood externalities, discouraging investment in remaining the stock, and aggravating neighborhood decline. Again, during the 1974-1981 period, the number of inadequate units (judged by condition of unit and condition of neighborhood) increased by almost 3 million units nationwide; the percentage of renters in inadequate units increased from 20.2 to 23.9 percent of all renters (Apgar 1987).

Further, it is not evident that low-income families are *choosing* to upgrade quality. In 1977, over 50 percent of very-low-income households were paying in excess of 30 percent of income; over 20 percent of these households were paying in excess of one half of gross income (President's Commission on Housing 1982: Table 1.4). The incidence of excessive rent burden accelerated in the 1980s. Stagnant incomes coupled with rising rents and a significant reduction in available stock drove up the rent burdens of low-income households. Units have been filtering out of the market; the lowest-quality submarkets appear to have been in a freefall, quickly filtering out of the market as owners cut losses by ceasing to operate properties (Welfield 1972).

These conditions suggest that low-income renters may be unable to obtain housing within the market at a quantity and price level consistent with their incomes. Extremely low elasticities evidenced in the Experimental Housing Allowance Program (EHAP) experiment may reflect this situation (Hanushuk and Quigley 1981).

In several regional housing markets, the lack of available housing units for the special needs of low-income groups, especially large families, reflects a continued mismatch between housing needs and units provided through filtering. The rental stock does not contain high levels of large-family housing; in fact, stock changes to increase revenues by raising density may have aggravated the imbalance in large units despite the demand for such units by low-income households.

With the stagnation of income growth, the incentive to reconfigure units for filtering has declined significantly.

There is evidence that the cost push of operations may account for rent levels (de Leeuw 1971). Since units passing through the housing stock tend to be older, they generally do not incorporate recent energy-saving technologies. Separate energy-metering and replacement of heating equipment with more efficient technology and insulation are among the strategies which would tend to lower operating costs per unit of housing service. Unfortunately, in an environment of weak demand, it is difficult to justify the improvements, with owners opting instead for continued downward filtering through the market.

In summary, while there are strong indications that housing units do filter to low-income households, several factors combine to reduce the effectiveness of filtering as an exclusive vehicle for providing low-income housing. Economic actors may exacerbate disinvestment in low-income markets, for both economic and racial reasons. After passing through the market, units are often simply abandoned, further reinforcing disinvestment in low-income neighborhoods. Moreover, given recent price and abandonment information, it is not evident that the supply of units to low-income households is responsive to the financial or physical needs of occupants. In the case of special-needs groups, there are indications that the filtering process will consistently undersupply units, since rational economic actors, ignoring the actions of others, would tend to increase densities to maximize revenues. Finally, as the experience of the 1980s has indicated in many housing markets, the stagnation of income growth may preclude sufficient new construction to permit efficient filtering; the engine of filtering requires increasing income levels to generate demand for units, especially in the short run.

Improving the Filtering Process

A review of the recent decades indicates that the supply of units provided to lower-income households through filtering has led to improved quality, albeit at a higher cost. However, it is not clear the gains from filtering are permanent. As housing continues to filter through the housing market, disinvestment in low-income markets has accelerated removal of substandard units, but may have also accelerated the passage of quality units through the lower-rent segment of the housing market.

Moreover, the 1980s has ushered in a new era of housing consumption. As Adams (1987) has indicated:

> The future success . . . of the much-maligned filtering process, is uncertain because of the breakdown of the traditional political housing alliance, the stagnation of real

> incomes among the middle classes, the growing number of people below the poverty level, and a housing finance system that . . . is subject to full market forces and credit competition . . . [Without] high quality, low cost housing, the continued steady improvement in the shelter available for the poor is unlikely in the 1980s and beyond. (p. 276)

It is not clear that the filtering process as manifested in the prior two decades will continue to improve housing conditions for the poor. Indeed, evidence on increased rent burdens, doubling up, and continued high rates of abandonment and homelessness all seem to indicate a breakdown in the filtering process. Further, racial barriers continue to skew the results of filtering, further limiting the quality of improvements for some low-income households. Moreover, regional migration coupled with the loss of units through disinvestment has limited gains through filtering and, in many markets, decreased the social welfare of lower-income households.

In assessing the role of filtering, it seems prudent to focus on three key issues. First, can filtering be better directed at the top end of the market? Second, can the pace of quality decline be slowed at the bottom end of the market? And, finally, can barriers to effective filtering benefiting all segments of the population be removed?

The pace of new construction is dependent on three key factors: income growth, technology improvements, and the price of construction. Income growth is difficult to assess; while the baby-boom cohort will be in the ages of establishing and expanding families (Sternlieb and Hughes 1986), overall family formation rates are projected to decline from those of the past decade, weakening housing demand. However, increasing technological capabilities may raise the demand for move-up housing as consumer-demanded improvements are incorporated into housing (Burns and Grebler 1986). Government incentives to incorporate consumer technologies could shift housing-style demand, increasing housing demand, if incomes rise above the stagnant levels of recent years.

Similarly, government activities to lower the cost of construction would have a positive effect on home purchases, increasing the level of stock filtering. However, it is not clear that a more decisive government role in cost-cutting would result in significantly reduced costs (Weicher 1987).

These factors suggest a defensive posture should be maintained, based on protecting any gains made from filtering by cushioning units as they pass down the income ladder and limiting the outflow of units through the bottom of the market. Disinvestment and abandonment, though rational for profit-maximizing owners, severely limit the gains

through filtering, and may entirely eradicate gains made at the bottom of the market. Further, this disinvestment spiral reinforces itself, resulting in, as Stegman indicates, "a blowout in the central city." These conclusions imply that all units of government should concentrate program efforts at limiting the loss of units, through a combination of supply-preservation and demand-supplement strategies. Policies focusing on unit preservation could include expanded loan/grant programs for low-income properties, tax relief for targeted properties (lowering the fixed cost of a building), and other incentives designed to offset reduced rental profitability. In several communities, nonprofit organizations have stepped in to recover and/or maintain low-income property. These and other efforts could target assistance to units (and neighborhoods) in need.

Removing barriers to effective filtering is the most difficult policy shift to accomplish. Racial discrimination continues to have a pervasive influence on the American housing market. Discrimination continues to limit choice, provide segmented markets to minorities, and generally blunt potential filtering gains made by minorities. Aggressive fair housing enforcement and prosecution of discriminatory employment practices would not stop central-city decline, but would expand the ability of all families to better reflect housing desires. Reducing barriers between segregated markets would increase the likelihood that all income and racial groups would attain the benefits of increasing quality generated by the filtering process.

In sum, the problem of filtering in the past may not have been in generating sufficient production for units to "trickle down" to lower-income groups; it may be in assuring that units that trickle down do not trickle out of the housing system. Moreover, as current housing affordability problems attest, the new economic position of housing, coupled with lower household formation rates and stagnant income growth, may dampen construction and limit gains from new construction reaching lower economic groups.

REFERENCES

Aaron, Henry. 1972. *Shelter and Subsidies: Who Benefits from Federal Housing Policies.* Washington, D.C.: The Brookings Institute.

Adams, John. 1987. *Housing America in the 1980s.* New York: Russell Sage Foundation.

Apgar, William C., Jr. 1987. "The Leaky Boat: A Housing Problem Remains." In *Housing America's Poor*, Peter D. Salins, ed. Chapel Hill, North Carolina: The University of North Carolina Press, 67-89.

Braid, Ralph M. 1984. "The Effects of Government Housing Policies in a Vintage Filtering Model." *Journal of Urban Economics* 16: 272-296.

Burns, Leland S., and Leo Grebler. 1986. *The Future of Housing Markets: A New Appraisal.* New York: Plenum Press.

Daniels, Charles B. 1975. "The Influence of Racial Segregation on Housing Prices." *Journal of Urban Economics* 2: 105-122.

de Leeuw, Frank. 1971. "The Supply of Rental Housing." *American Economic Review* 61 (December): 806-817.

Edel, M. 1972. "Filtering in a Private Housing Market." In *Readings in Urban Economics,* M. Edel and Jerome Rothenberg, eds., New York: Macmillan.

Elliott, Donald S., Michael A. Quinn, and Robert E. Mendelson. 1985. "Maintenance Behavior of Large-Scale Landlords and Theories of Neighborhood Succession." *AREUA Journal* 13(4): 424-445.

Fisher, Ernest M., and Louis Winnick. 1951. "A Reformulation of the Filtering Concept," *Journal of Social Issues* 7(1): 47-85.

Fossett, James W., and Gary Orfield. 1987. "Market Failure and Federal Policy: Low-Income Housing in Chicago 1970-1983." In *Divided Neighborhoods: Changing Patterns of Racial Segregation,* Gary A. Tobin, ed., Beverly Hills, California: Sage Publications.

Grigsby, William G. 1963. *Housing Markets and Public Policy.* Philadelphia: University of Philadelphia Press.

Grebler, Leo. 1952. *Housing Market Behavior in a Declining Area.* New York: Columbia University Press.

Hanushek, Eric A., and John M. Quigley. 1981. "Consumption Aspects." In *Do Housing Allowances Work,* Katharine L. Bradbury and Anthony Downs, eds., Washington, D.C.: The Brookings Institution.

Kain, John F., and John M. Quigley. 1975. *Housing Markets and Racial Discrimination: A Microeconomic Analysis.* New York: National Bureau of Economic Research.

Lansing, John B., Charles Wade Clifton, and James N. Morgan. 1969. *New Homes and Poor People: A Study of Chains of Moves.* Ann Arbor: University of Michigan Institute for Social Science Research.

Little, J. 1976. "Residential Preferences, Neighborhood Filtering and Neighborhood Change." *Journal of Urban Economics* 3: 68-81.

Lowry, Ira. 1960. "Filtering and Housing Standards: A Conceptual Approach." *Land Economics* 36(4): 362-370.

Muth, Richard. 1973. "A Vintage Model of the Housing Stock." *Papers of the Regional Science Association* 30: 141-156.

Ohls, James C. 1975. "Public Policy Toward Low Income Housing and Filtering in Housing Markets." *Journal of Urban Economics* 2: 144-171.

Olsen, Edgar O. 1969. " A Competitive Theory of the Housing Market." *American Economic Review* 59: 612-621.

President's Commission on Housing. 1982. *The Report of the President's Commission on Housing.* Washington, D.C.: U.S. Government Printing Office.

Rapkin, Chester. 1973. "Price Discrimination Against Negroes in the Rental Housing Market." In *Housing Urban America*, Jon Pynoos et al., eds., Chicago: Aldine Publishing Company.

Ratcliff, Richard U. 1949. *Urban Land Economics.* New York: McGraw Hill.

Rydell, C. Peter. 1979. *The Shortrun Response of Housing Markets to Demand Shifts.* Rand 2453-HUD. Santa Monica, California: The Rand Corporation (September).

Stegman, Michael A. 1977. "The Neighborhood Effects of Filtering." *American Real Estate and Urban Economics Journal* 5, 2 (Spring): 227-241.

Sternlieb, George, and James W. Hughes. 1986. "Demographics and Housing in America." *Population Bulletin* 41, 1 (January).

Sweeney, James L. 1974. "A Commodity Hierarchy Model of the Rental Housing Market." *Journal of Urban Economics* 1: 288-323.

Weicher, John C. 1987. "Private Production: Has the Rising Tide Lifted All the Boats?" In *Housing America's Poor*, Peter D. Salins, ed., Chapel Hill, North Carolina: The University of North Carolina Press.

Welfeld, Irving. 1972. "That 'Housing Problem' -- The American vs. the European Experience." *The Public Interest* 27 (Spring): 78-79.

Weicher, John C., and Thomas G. Thibodeau. 1988. "Filtering and Housing Markets: An Empirical Analysis." *Journal of Urban Economics* 23: 21-40.

White, Harrison C. 1971. "Multipliers, Vacancy Chains, and Filtering in Housing." *AIP Journal* 37: 88-94.