

**Comments on the U.S. Census Bureau
and Interagency Technical Working Group
Supplemental Poverty Measure**

by

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1. Overview

Longstanding government measures of poverty are based on income thresholds that are uniform across locations. The newly developed supplemental poverty measure (SPM) departs from that tradition by setting higher income thresholds in metropolitan and rural areas with higher housing costs. This allows for inter-metropolitan differences in housing prices that affect the level of income necessary for a family to purchase a minimum level of food, clothing, shelter, and other essential items necessary to attain a minimum standard of living. Numerous government programs that provide assistance to the poor define eligibility in part based on a family's designated poverty status. Although the SPM is not being used for such purposes, the possibility exists that it may be used in this fashion at some point in the future. In that regard, the SPM has potential to affect not only perceptions of regional differences in poverty, but also the geographic distribution of benefits from federal and state government programs that provide assistance to the poor.

Central to the new SPM measure of poverty is the idea that the level of income that defines a given size family's poverty status should be higher in metropolitan (and non-metropolitan) areas with high housing costs. For these purposes, housing costs are defined so as to include expenditures on utilities including electricity, heating, etc.. This is presumably motivated by recognition that the need for heating/cooling as well as energy prices differ widely across geographic areas as between Houston versus Detroit, for example. The new poverty measure also measures housing costs differently for renters, owner-occupiers with a mortgage, and owner-occupiers without a mortgage. This feature of the SPM is motivated by observable differences in the annual out-of-pocket costs of housing that vary with each of the three housing tenures just noted. Calculation of the SPM, at least in its current form (e.g. Renwick (2011)), is based on either mean or median housing costs for individual identified locations.

My comments below are organized into three subsections. I will first offer some perspectives intended to critique the SPM. This is followed by one suggestion for an alternative feasible method of calculating the SPM (to use hedonic-based measures of quality adjusted housing costs). Suggestions for further research on geographic adjustment of poverty thresholds are provided in the final section, as are recommendations for the SPM going forward.

2. Critique of the SPM

I will comment here on several issues that affect interpretation of the SPM and related measures. First among these is what drives spatial variation in housing costs and whether local residents obtain something valuable in exchange for living in an expensive area. This is relevant for spatial variation in housing costs across metropolitan areas and also within individual cities. This question also goes to the very core of the SPM and has implications for the geographic scale over which variation in housing costs should be taken into account when setting poverty income thresholds. A second set of issues concerns housing tenure status. Families choose whether to live in owner-occupied housing, and if so, the size of the mortgage to hold. Here too there are questions about what drives a low-income family's choice of housing tenure and whether the family might obtain something valuable in exchange for choosing a seemingly more expensive way of meeting their housing needs. Each of these sets of issues are considered below.

2.1 Do families derive benefits in return for living in more expensive locations?

At the outset, it is important to recognize that housing values and rents are driven by land values and construction costs. The costs of construction include materials and labor and are quite similar across locations, at least in comparison to lot values. This suggests that raw land and housing values vary spatially primarily in response to the presence of local attributes that are typically not traded directly on

the market. Such attributes include everything from air quality to school quality, scenic views, access to public transportation, and perhaps most importantly, proximity to employment. These location-specific attributes are valued by households and firms in differing degrees contributing to spatial variation in housing costs. Two questions immediately arise in regards to the SPM: (i) to what extent do families derive benefits from living in expensive areas and (ii) should such benefits and related differences in housing costs be taken into account when measuring poverty?

It is also important to recognize that adjusting poverty measures for spatial differences in the cost of housing changes the poor's relative cost of access to attributes in expensive metro areas relative to inexpensive locations. That is because some state and federal assistance programs for the poor are dependent on a family's designated poverty status. Increasing the poverty income threshold in expensive areas has the potential to increase welfare benefits in expensive cities relative to inexpensive locations. To the extent this occurs that may attract or help to retain low-income families in high-cost locations. It is desirable, therefore, to consider the extent to which the SPM might induce shifts in the location of the poor, and possible unintended consequences from such behavior.

In both instances – whether the poor derive benefits from living in a more expensive location, and whether spatially-based poverty measures might attract the poor to high-cost areas – a key underlying consideration is the extent to which the poor are mobile and choose their locations. In part, this is a question of time horizon since over a sufficiently long horizon most families are mobile, at least to some degree. This is also a question of relocation costs and access to alternative locations. Moving costs include the possible loss of valuable locally-based social networks including family and friends that may be concentrated in a particular metropolitan area. For many minorities including especially recent immigrants, this could also include the presence of ethnic/racial enclaves in which social and economic support networks may be more accessible. Other costs include access to car travel which frees up the auto owner from reliance on foot transport and public transit. This latter issue is of special importance for low-income families as the very poor are far less likely to own a car than are higher income families.

On this latter point, consider Table 1 below which is taken from Rosenthal (2008a). The table presents regressions in which the dependent variable is the percent of occupied housing units in a census tract that own a car. Control measures include distance to the central business district (CBD) which proxies for the local density of development and also the census tract poverty rate. Estimates in the first three columns are based on data from the 1980, 1990, and 2000 censuses, respectively. These regressions also control for MSA fixed effects. The fourth column pools data across the three decades and includes MSA by year fixed effects.

Notice that the coefficients on tract poverty rate are always close to -1.0 for each of the regressions. This indicates that as an approximation, a tract populated entirely with families below the poverty line would have close to zero car ownership – consistent with the idea that families in poverty are far less likely to own cars. These estimates confirm that very low income families in urban areas are generally reliant on walking and public transit for travel. It is worth emphasizing that public transit is more effective and common in densely developed areas. Glaeser, Kahn, and Rappaport (2007) draw on both of these stylized facts in arguing that access to public transit helps to explain why the urban poor are disproportionately concentrated in the central cities.

Two sets of models in the urban economics literature suggest that provided households (and firms) are mobile, spatial variation in housing costs reflect differences in local attributes including especially differences in proximity to employment opportunities. The first of these are within-city models developed by Mills and others in the late 1960s and early 1970s. These models tend to ignore within-city variation in wages which is typically thought to be relatively modest. A core point in these models is that house prices fall with distance to employment centers so as to compensate workers for longer, more

costly commutes. More generally, house prices fall with distance to *any* attractive attribute, of which proximity to employment is just one such example. Other valued local attributes include things like proximity to public transit, school quality, safe neighborhoods, scenic views, etc. as noted above.

Table 1: Car Ownership and Poverty
(Dependent Variable: Percent of census tract occupied housing units that own a car)^a

	Individual Decades			Balanced Panel
	1980	1990	2000	1980-2000
Tract Poverty Rate	-1.0432 (-300.36)	-0.8692 (-301.42)	-0.8001 (-265.77)	-0.8867 (-265.07)
Distance to CBD	0.0022 (61.51)	0.0019 (57.49)	0.0015 (47.62)	0.0019 (75.35)
Constant	0.9711 (1,340.51)	0.9647 (1,396.17)	0.9657 (1,374.65)	0.9679 (1,855.94)
Observations ^b	48,950	50,312	50,511	145,590
Adj. R-squared	0.7573	0.7510	0.7242	0.7380
MSA Fixed Effects ^c	325	331	331	-
MSA*year FE ^b	-	-	-	975

^at-ratios are based on robust standard errors.

^bSamples are restricted to census tracts in MSAs.

^cFixed effect values reflect deviations from the sample-wide constant.

Source: Rosenthal (2008a).

A different set of models originates with Roback (1982) and subsequent empirical applications by Blomquist et al (1989) and Gyourko and Tracy (1991). These papers consider inter-city differences in housing costs and wages. In this literature – sometimes referred to as the quality of life literature – cross-city differences in attributes are capitalized into metro-level house prices and wages. This arises because inter-city differences in attributes shift the supply and demand for labor across areas as workers and firms seek more attractive/profitable locations. From the worker’s perspective, real wages adjust across cities to ensure a spatial equilibrium that eliminates incentives for similar-type workers to relocate. In previous work (Gabriel and Rosenthal (2005) and Chen and Rosenthal (2008)), I further emphasize that the sum of labor and land costs will also adjust across cities to ensure that firms do not have any incentive to relocate. In these models, lower real wages signal the presence of local amenities that are valued by the workers. Analogously, high location-specific input costs (as measured by the sum of labor and land costs) signal the presence of local attributes that are valued by firms. Because households choose locations to maximize wellbeing while firms choose locations to maximize profits, households and firms need not favor the same locations. Results from my previous work in this area (Gabriel and Rosenthal (2005) and Chen and Rosenthal (2008)) confirm this: households often favor coastal cities in relatively temperate climates and also some rural areas, while firms tend to favor large metropolitan areas with agglomerations of existing employment and industry (e.g. Rosenthal and Strange (2004)).

Taken at face value, an important segment of the prior urban literature could be interpreted as to suggest that there may be little basis for adjusting measures of poverty for differences in housing costs across metropolitan areas. Instead, differences in housing costs across locations reflect differences in valued local attributes that are implicitly “purchased” by households through their choice of where to live. There is, however, an important “but.” If poor households face constraints that restrict their mobility then it is possible that market prices (including both wages and housing costs) would not adjust to compensate the

poor for differences in attributes across locations. An example of an entire literature predicated on this idea is the “spatial mismatch” literature (e.g. Holzer (1991), Kain (1968, 1992)).

Early versions of the spatial mismatch literature argued that suburbanization of jobs coupled with suburban housing market discrimination against blacks impeded African American employment opportunities. Although more recent portions of the literature have broadened in focus, the basic structure remains: constraints on mobility prevent market prices from fully compensating lower-income (and minority) individuals for differences in proximity to different local attributes, including proximity to employment. In a paper with Gabriel (Gabriel and Rosenthal, 1998), I explore this question using data from the 1980s. Results indicate that commute distance to work is longer for urban blacks as compared to comparable white workers. That difference is diminished when neighborhood-level attributes and housing costs are taken into account (through the use of neighborhood fixed effects) but a race-related difference remains.

Consistent with the discussion above, implicit in the SPM is the assumption that very low-income families are relatively immobile and/or face constraints on their residential opportunities. Those constraints prevent poor families from being fully compensated for differences in local attributes through spatial variation in housing costs (and wages). To the extent this is true, then low-income families living in expensive locations will only be partly compensated for their higher housing costs through access to valued local attributes (e.g. better employment opportunities, higher quality schools, etc.). Under such conditions it would be desirable to adjust poverty income thresholds for local differences in housing costs.

This discussion points to two questions that bear on interpretation and implementation of the SPM. The first is whether the poor face notable constraints that limit their residential opportunities. The second is whether the set of local attributes that are capitalized into local house prices are ones that should be taken into account when considering whether a family is classified as not being able to afford basic “necessities.” For example, should proximity to employment and shorter commutes be treated as a necessary “commodity”? Should a scenic view be considered, or proximity to better schools?

The spatial mismatch literature highlights the role of racial/ethnic segregation and discrimination as one possible source of such restrictions that might limit the residential opportunities of the poor. Another source could be local zoning laws that mandate large lots and low-density development. A very different type of restriction could be the limited ability of the poor to afford a vehicle as documented above. Especially in urban areas this would tend to push the poor to inner city location in order to gain better access to public transit (e.g. Glaeser, Kahn, and Rappaport (2007)). Yet another possible constraint on housing opportunities for the poor is the age of the local housing stock. Higher income families tend to occupy newer homes while the poor tend to occupy old homes, at least if they are not in subsidized housing. Because cities develop from the center outwards over time, and redevelop from the center outwards over time, this affects the age of the housing stock at different locations, and therefore, the location of housing opportunities for low-income families (e.g. Brueckner and Rosenthal (2009), Rosenthal (2008b)). If any of these factors impede the ability of low-income families to consider alternative locations within or across cities, then the possibility exists that the poor may live on “islands” that are relatively disjoint from the rest of the housing market. In that event, it is possible that local attributes may not fully compensate lower income families for differences in house prices and wage within and across cities.

A final constraint of a completely different nature should also be mentioned. The very poor tend to have limited labor market skills and are likely to work at minimum wage jobs when employed. Intercity quality of life models, however, are based on the idea that *both* house prices and nominal wage adjust to offset between-city differences in amenities. This would not occur for minimum wage workers. Instead,

even if the poor are mobile, differences in real wages across metropolitan areas would be driven primarily by differences in housing costs. Although it is possible that housing price (rent) capitalization could still fully offset cross-city differences in amenities, minimum wage constraints may impede such outcomes. This is something that requires further consideration as it provides an additional possible argument for taking cross-city variation in housing costs into account when setting poverty income thresholds.

2.2 Do family’s derive benefits from choosing a more “expensive” form of housing tenure?

As noted earlier, the SPM calculates different poverty income thresholds for renters, owner-occupiers with a mortgage, and owner-occupiers without a mortgage. This section offers some comments and perspective on that feature of the SPM.

It is important to recognize that housing tenure is for many families a choice. This is almost certainly the case for low-income homeowners who could otherwise rent. It is doubly the case for many low-income homeowners without a mortgage as many of these families could likely have secured some form of a mortgage or could have also chosen to rent. Among low-income homeowners with a mortgage there is also often discretion as to the size of the mortgage, loan term (e.g. 15 year, 30 year, etc), and loan type (e.g. fixed, adjustable). These features affect the size of the monthly mortgage payments.

The table below offers some perspective by reporting rental rates among families below the poverty line, disaggregated by urban/rural locations (see Rosenthal (2008a) for details). From the table, it is noteworthy that among the urban poor, rental rates are quite high, at roughly 81 percent. Nevertheless, that still leaves 19 percent of the urban poor in owner-occupied housing. For families in less densely developed areas rental rates among the poor are far lower: roughly 64 percent in non-central city urban areas and 55 percent in non-metropolitan areas. These numbers indicate that many families living in poverty own their own homes.

Table 2: Rental Rates Among Families Living in Poverty in the United States^a

Entire U.S.	Not In Metro Area	In Metro Area Outside Central City	In Metro Area Central City
68.67%	55.25%	63.88%	80.82%

^aSample excludes families in mobile homes. Estimates are based on household-level data from the 2000 Decennial Census. Household weights are used to ensure results are representative of the entire U.S.

Given the mix of housing tenure among the poor, on the surface it would seem natural to allow for differences in housing costs dependent on whether a family rents, owns without a mortgage, or owns with a mortgage. Nevertheless, housing tenure including the size of the mortgage is a choice and this has possible implications for interpretation of SPM poverty income thresholds. Previous studies, for example, have documented that most homeowners take on more mortgage debt than is needed to purchase their home given the family’s wealth relative to home value. Findings from this literature indicate that a portion of the “excess” mortgage debt is used for consumption and home improvements, but an important share is also used for investments of various sorts. See, for example, Jones (1994) and Canner et al (2002).

Although it is tempting to view the poor as having no wealth and therefore entirely reliant on financing to purchase a home, this is likely an oversimplification for some households. The SPM recognizes this by

treating homeowners without a mortgage differently from homeowners with a mortgage. An open and relevant question is the extent to which the poor might hold discretionary amounts of mortgage debt. It is also important to know what sorts of non-housing expenditures and/or investments the poor might use that additional debt for should they hold larger mortgages than are necessary to finance their homes. It is also important to recognize that homeowners essentially rent to themselves, and thereby receive a flow of imputed income from the home.

To illustrate, consider the following hypothetical example. Suppose three low-income families live in identical adjacent homes. The homes are completely durable and require no maintenance. There are no property or income taxes. All three families have zero earned income. One family rents, one owns without a mortgage, and one owns with a 100 percent interest-only mortgage. Suppose that each of the homes is valued at \$100,000 and each family has a net worth of \$100,000. Mortgage rates are 3 percent as are rates on U.S. treasury bonds. Market rents are \$3,000 (equal to the discount rate multiplied by house value). The family that rents invests their wealth in treasury bonds and earns \$3,000 interest each year, just enough to cover their housing rent. The family that owns without a mortgage receives no interest income and has no out of pocket housing expenses: this family implicitly rents to itself and is equally well off financially as the renter. The family that owns with a 100 percent mortgage pays \$3,000 in mortgage interest each year. The family invests both the \$100,000 mortgage and its original \$100,000 of net wealth in treasury bonds. This yields a total investment of \$200,000 which generates \$6,000 interest earnings. After paying the \$3,000 interest owed to the mortgage lender, this family enjoys a net investment income of \$3,000. This family is therefore better off financially because it leveraged its home purchase and invested the mortgage in a risk free asset.

The example above is very stylized but illustrates two important points. First, owner-occupiers that own their homes without a mortgage effectively rent to themselves. Absent taxes or other considerations, such families face the same net housing costs as renters. Second, for owner-occupiers with discretionary levels of wealth relative to the value of their home, there is a financial incentive to lever up on the mortgage. This is likely especially relevant for families that hold 2nd mortgages, including home equity lines of credit and related loan instruments. The return from leveraging up is also amplified if the home appreciates in value (a scenario not shown here). Although on the surface, holding a larger mortgage may appear to increase a household's housing costs, the illustration above suggests that higher monthly mortgage payments could be offset or even more than compensated through an increase in investment earnings or other uses of the mortgage debt that are highly valued by the family. The SPM, however, sets different poverty income thresholds for renters and owners, including *higher* income thresholds for homeowners with a mortgage. These issues should receive further attention.

A final perspective on the tenure issues above is that the decisions to own a home and the chosen level of mortgage debt are both tied to a family's level of wealth. Wealth is not observed in the ACS. Although the ACS does provide some information on the family's mortgage, details on the mortgage are limited. This suggests that it will be difficult to adequately address issues related to size or mortgage when using the ACS to calculate the SPM.

3. Measuring Housing Costs in the SPM

The current plan for the SPM as proposed by the ITWG measures metropolitan level and rural housing costs using median or mean rents and prices for the different locations (see Renwick (2011), page 9). Although such an approach will likely yield informative comparisons, a better option seems to be available when working with the ACS. Specifically, because the ACS is a very large sample, it should be possible to run hedonic regressions of log rent and log price controlling for housing attributes that are reported in the survey in addition to location fixed effects. The location fixed effects would then capture

regional differences in *quality adjusted* house prices and rents. For examples of this approach, see previous work of mine on quality-of-life measures with Gabriel and Chen (Gabriel and Rosenthal (2005), Chen and Rosenthal (2008)).

In the ACS, one can identify the following attributes of the homes (see www.ipums.org for details):

- presence of kitchen or cooking facilities
- presence of a refrigerator
- sink with faucet
- presence of a stove
- number of rooms
- complete plumbing facilities
- number of rooms
- presence of hot and/or cold piped in water
- presence of a bathtub or shower
- presence of a flush toilet
- age of the structure
- number of housing units in the structure
- number of bedrooms

Although this is clearly an incomplete list of the attributes of any given home, it may well be sufficient to explain much of the variation in the quality of the structure that a family occupies, and especially when considering lower income housing. The location fixed effect can then be used to highlight the degree to which quality adjusted prices and rents vary across locations. To see how, consider the following.

One would first run regressions of the following sort:

$$\log(r_{s,jt}) = \gamma_{jt}^r + \theta_t^r Z_s^r + u_{s,jt}^r \quad (3.1)$$

where r is the rent for house s in location j and time period t . Z is the vector of housing attributes described above while γ_{jt}^r is the location fixed effect. The regression would be run separately for each time period allowing γ_{jt}^r to vary across sample years.

One would next need to form a fixed bundle of housing attributes that would be used to specify a “standard” type home, \bar{Z}^r . The rent (price) for a standard home in location j in period t is then formed by specifying:

$$\bar{r}_{jt} = \exp[\gamma_{jt}^r + \theta_t^r \bar{Z}^r] \quad (3.2)$$

Quality adjusted rents (prices) based on (3.2) could then be augmented with further measures of utility costs as described in Renwick (2011).

Controlling for house quality in this fashion would be preferable to using median or mean housing costs, and should be feasible given the large sample sizes in the ACS. A reason not to do this would be if the type of housing stock available for the poor to occupy differed widely across metropolitan and rural areas. At least for urban areas, this seems like a relatively minor concern. However, for urban versus rural

comparisons, there could be notable differences in access to mobile homes versus multi-family housing, so this is something worth considering further.

4. Areas for Further Research and Recommendations

4.1 Future research

Two areas for further research really stand out. The first is research on the mobility of the poor. How frequently do very low income families move and over what geographic distance? When the poor move do they go to a different neighborhood within the same city, or to a different metropolitan area altogether? As a general principle, differences in housing costs across locations should be taken into account when setting poverty income thresholds provided one of two conditions are met: (i) if low-income families are not fully compensated for higher cost locations through improved access to valued local attributes *or* (ii) local attributes that prompt higher housing costs are not of a nature that lift low-income families out of poverty (e.g. scenic views). From this perspective, controlling for location at the level of a city block would clearly be too refined a geographic level. That is because mobility costs are likely low at the block level and differences in housing costs between city blocks reflect differences in block-level amenities. An open question, however, is over what distance or geographic unit (e.g. county, metro areas state) are low-income family residential locations approximately exogenously and not subject to choice? A further challenging issue is to specify those local attributes that are not typically considered necessary to help lift a low-income family out of poverty, as with scenic views and proximity to a beach, for example.

A second area of further research is to assess the degree to which the poor hold discretionary amounts of mortgage debt and use that additional debt to finance other non-housing activities, including possibly non-housing investments. Although the stereotypic image of a family living in poverty is one that has little income and also little wealth, some low-income families may nevertheless hold notable stores of wealth. An example would be house-rich cash-poor elderly. For low-income families with some wealth, the size of the mortgage may be an important choice that has implications for whether the family is truly forced by circumstances beyond their control to live in poverty.

A third area worth investigating is the extent to which the poor migrate to cities that offer more generous social safety nets. This has implications for possible use of the SPM to govern eligibility for state and federal programs designed to provide assistance to the poor.

A fourth place for further research is to explore the use of regression-based methods for measuring quality adjusted housing rents and prices across locations using the ACS.

4.2 Recommendations

Should the SPM adjust poverty income thresholds for cross-location differences in housing costs? I believe that the answer is yes because constraints on mobility likely do prevent the poor from being fully compensated for cross-metropolitan differences in housing costs. However, the extent of adjustment is an open question and almost surely lies between the two extremes of zero adjustment (as with the current official poverty measure) and 100 percent adjustment (as with the current proposed version of the SPM). Instead, the level of adjustment should depend on the extent to which the poor are *forced* – because of mobility constraints – to implicitly pay for local attributes that policy makers deem unnecessary for the poor to attain a minimum level standard of living, as with a scenic view, for example. If instead the poor *choose* to locate in a more expensive area that provides valuable services, such as proximity to public transit, then less adjustment for poverty income thresholds would seem appropriate.

In addition, while a case can be made for setting poverty income thresholds at different levels for renters, owners without a mortgage, and owners with a mortgage, I believe the case is fairly weak and difficult to implement. Instead, a more expedient and defensible approach is to measure housing costs as if all low-income families are renters. This approach would implicitly recognize that the decision to own a home is typically a choice, as is often the size and type of mortgage.

References

- Blomquist, Glenn, Mark Berger, and John Hoehn (1988), "New Estimates of the Quality of Life in Urban Areas," *American Economic Review*, 78, 89-107.
- Brueckner, Jan and Stuart Rosenthal (2009). "Gentrification and Neighborhood Cycles: Will America's Future Downtowns Be Rich?" *Review of Economics and Statistics*, 91(4), 725-743.
- Canner, Glenn, Karen Dynan, and Wayne Passmore (December 2002), "Mortgage Refinancing in 2001 and Early 2002," *Federal Reserve Bulletin*, 469-481.
- Chen, Yong and Stuart Rosenthal (2008). "Local Amenities and Life Cycle Migration: Do People Move for Jobs or Fun?" *Journal of Urban Economics*, 65(3), 519-537.
- Gabriel, Stuart and Stuart Rosenthal (1996). "Commute Times, Neighborhood Effects, and Earnings: An Analysis of Compensating Differentials and Racial Discrimination," *Journal of Urban Economics*, 40: 61-83.
- Gabriel, Stuart A. and Stuart S. Rosenthal (2004). "Quality of the Business Environment Versus Quality of Life: Do Firms and Households Like the Same Cities?" *The Review of Economics and Statistics*, 86(1): 438-444 (February).
- Glaeser, Edward L., Mathew Kahn, and Jordan Rappaport (2008). Why Do the Poor Live in Cities? The Role of Public Transportation, *Journal of Urban Economics*, 63, 1-24.
- Gyourko, Joseph and Joseph Tracy (1991), "The Structure of Local Public Finance and the Quality of Life," *Journal of Political Economy*, vol. 99, no. 4, 774-806.
- Holzer, Harry (1991). "The Spatial Mismatch Hypothesis: What Has the Evidence Shown." *Urban Studies*, 28(1), 105-122.
- Jones, Larry (1994), Home Mortgage Debt Financing of Nonhousing Investments, *Journal of Real Estate Finance and Economics*, 9, 91-112.
- Kain, John F. (1968), "Housing Segregation, Negro Employment, and Metropolitan Decentralization," *The Quarterly Journal of Economics*, 82(2), 175-197.
- Kain, John F. (1992), "The Spatial Mismatch Hypothesis: Three Decades Later," *Housing Policy Debate*, 3(2), 371-392.
- Renwick, Trudi (2011), "Geographic Adjustments of Supplemental Poverty Measure Thresholds: Using the American Community Survey Five-Year Data on Housing Costs," U.S. Census Bureau *mimeo*.
- Roback, Jennifer (1982), "Wages, Rents, and the Quality of Life," *Journal of Political Economy*, 90, 1257-78.
- Rosenthal, Stuart S. and William Strange (2004). "Evidence on the Nature and Sources of Agglomeration Economies", in the Handbook of Urban and Regional Economics, Volume 4, pg. 2119-2172, Elsevier, eds. Vernon Henderson and Jacques Thisse.

Rosenthal, Stuart (2008a). "Where Poor Renters Live in Our Cities: Dynamics and Determinants," *in* "Revisiting Rental Housing: Policies, Programs, and Priorities," Nicolas Retsinas and Eric Belsky, *eds.*, Brookings Press, 59-92.

Rosenthal, Stuart (2008b). "Old Homes, Externalities, and Poor Neighborhoods: A Model of Urban Decline and Renewal," *Journal of Urban Economics*, 63(3), 816-840.