Emmanuel Jimenez

The Value of Squatter Dwellings in Developing Countries

World Bank Reprints


No. 208. Michael Cernea, "Indigenous Anthropologists and Development-Oriented Research," Indigenous Anthropology in Non-Western Countries


No. 216. Avishay Braverman and T. N. Srinivasan, "Credit and Sharecropping in Agrarian Societies," Journal of Development Economics


The Value of Squatter Dwellings in Developing Countries*

Emmanuel Jimenez
University of Western Ontario and the World Bank

I. Introduction
A great proportion of urban dwellers in developing countries live in illegal squatter communities. Recent studies estimate that some 20%–30% of the population of the largest Asian cities inhabit so-called uncontrolled settlements. Similar figures obtain for African and Latin American cities, although over a wider range.1 Despite the fact that they are frequently made of makeshift and dilapidated materials, do not have access to basic services, and are under constant threat of being razed by the government authorities, squatter dwellings, like those in the established legal (or formal) sector, are economic goods and can be characterized by a market value. Thus, given the relative size of the population that they shelter, any analysis of urban housing markets in developing countries which relied solely on statistics on the formal sector would most likely be misleading.

Social scientists have begun to dispel the traditional notion that squatter housing units are more than temporary, valueless structures.

---

* I gratefully acknowledge the comments of J. M. Bamberger, F. H. Cummings, G. K. Ingram, D. H. Keare, K. S. Lee, J. C. Leith, D. Lindauer, J. F. Linn, and S. Margolis on an earlier draft. Special thanks are due to Professor Mila A. Reforma of the University of the Philippines and to the staff of the Research and Analysis Division of the Philippine National Housing Authority for designing and implementing the collection of the data. I am a consultant to the World Bank. The views expressed herein are my own and do not reflect those of the World Bank.

1 Some estimates are as follows: Manila (22%), Jakarta (25%), Seoul (30%), Dakar (30%), Lusaka (27%), Rio de Janeiro (27%), Mexico City (40%). It should be noted that the source of these figures, O. F. Grimes (Housing for Low-Income Families [Baltimore: Johns Hopkins University Press, 1972]), makes it clear that the definition of what constitutes a squatter community varies from country to country. We define squatter settlements as spontaneous (unplanned) agglomerations of dwellings whose residents do not hold title to the land. However, the residents may “own” the structures since they built them.

© 1982 by The University of Chicago. All rights reserved.
0013-0079/82/3004-0008$01.00
which are shoddily built on vacant land. However, figures have not been documented and relatively little is known about this “informal” market. How much are these squatter homes worth? What determines the value of these dwellings? Does this market differ significantly from that found in the formal sector? These questions have important implications for policy measures, such as urban development projects, which are intended to improve the lot of the low-income urban population.

This paper is intended as a first step in filling this gap in the literature. Aside from presenting estimates on the value of squatter dwellings for a sample in the Philippines, we will also derive the statistical relationship between value and housing characteristics (such as the availability of certain services). The resulting coefficients can be interpreted as the marginal prices of these characteristics. This exercise has some direct policy implications. In particular, the valuations of the dwelling units can be used to measure the implicit costs of housing projects which raze existing settlements to make room for dwellings with a certain set of characteristics. Also, if these valuations are indeed significant and are found to be consistent with physical measures of housing quality, then it is evidence that the official valuation of housing stock, based primarily on formal housing units, may be seriously underestimated. Further, the derivation of the determinants of housing value provides valuable price information about the implicit market for housing characteristics. As such, the resulting coefficients can be used: to control for price changes when value is used as a predictor of how housing quality changes over time; to gain some empirical insights into the benefits of providing certain housing characteristics, such as sounder building materials, running water, and sanitary facilities, in urban development projects; and as an initial step in estimating the parameters of the demand for housing characteristics.

Prior to any estimation, we must first confront the primary problem of all studies which require the value of owner-occupied dwellings—that of obtaining adequate data. The most accurate

---


4 The view that an improvement in benefits will be partially capitalized in higher land and housing prices and the use of the hedonic techniques in obtaining benefit measures are complicated issues and are well discussed in the literature—see A. M. Polinsky and D. L. Rubinfeld, “The Long-Run Effects of a Residential Property Tax and Local Public Services,” Journal of Urban Economics 5 (1978): 241–62, for a partial bibliography.

estimate of value would be the sale price of the house at the time of purchase. However, the frequency of such transactions in studying the characteristics of a housing market in a neighborhood limits the use of such information. Moreover, because no official records are kept of any of these largely illegal transactions, it is difficult to obtain information on the sale price of dwelling units in squatter areas. One easily accessible estimate is that of the "owner" of the structure (but not the land). Indeed, even for the United States, many studies use the owner's estimate of housing value (see Kain and Quigley for a list of such studies). However, this procedure raises additional questions regarding the accuracy and possible biases of the estimates. A secondary goal of this paper, then, is to evaluate the reliability of the owner's estimate of the value of his or her dwelling. In particular, it will compare owner's estimates with appraisal estimates and evaluate the results in light of two similar studies for U.S. data which concluded that, while errors of estimate (i.e., the discrepancy between owner and appraiser valuations) are quite large for individual properties, they are largely offsetting for reasonably sized samples.

II. The Data
In 1978, the Tondo Foreshore area of Manila contained the Philippines' largest concentration of squatter dwellings—over 200,000 low-income individuals out of a total city-wide population of 1.2 million in a landfill area of 137 hectares. It was also the oldest and most established squatter community with a long and well-documented political history. The structures exhibited a wide variance in terms of quality—makeshift homes of scrap metal could be found not far from those made of concrete and brick. However, they all shared a legacy of illegality and lack of services. Since then a World Bank-financed urban development project has legalized the residents' status. This project is meant primarily to provide basic services and tenure to the community. A monitoring and evaluation effort by the Philippine National Housing Authority's Research and Analysis Division (RAD) is gathering detailed housing information on 96 households (randomly selected from the Tondo through stratified samples) as subjects of a house-consolidation study. Designed to eventually determine the extent and the speed of house-upgrading activities, this data set provides information on the initial (i.e., before project implementation) housing conditions of the households. This includes estimates of the value of each

---

house by various appraisers as well as measures of its characteristics. It is the primary data source for this study.

As stated in the Introduction, the informal housing market, by definition, operates in a world which is beyond the scrutiny of conventional government activity. Since data and tax collection agencies do not enter this world, legislated restrictions such as minimum servicing requirements for housing are irrelevant. It is thus not a trivial task to study the market for squatter dwellings when selling prices are not recorded. In the absence of these recorded prices, the National Housing Authority’s RAD was very resourceful in obtaining information on alternative measures of housing value. Heads of households were asked by interviewers “How much do you think you could sell your house for?” For the 96 (out of 100) who responded, this figure is interpreted to be the owner's own valuation of the structure. A local professional appraiser-engineer was then hired to valuate the same dwelling units. Only one appraiser was used. A third potentially useful measure had to be disregarded for this study. The five most proximate neighbors were asked how much they thought the dwelling unit in question was worth. Unfortunately, the only figure available for this study was an average in which the upper extreme was dropped for each dwelling unit, thus seriously underestimating the results.

III. The Value of Squatter Dwellings
The housing value estimates are summarized in table 1. The owner’s assessment is 14,145.83 pesos (US$1,886) on average for the 96 households, which is not significantly different from the appraiser’s average estimate of 14,092 pesos (US$1,879). The first observation is that, contrary to what one might expect, these households do not live in hovels which have little value. Since average annual income in Tondo is about 7,400 pesos (US$982), the average appraised value of the house is about 90% greater than the average annual income per capita from regular sources, a significant amount which is not much different from the U.S. figure of 85%. This is partly attributable to the fact that Tondo is an established community, even though it has only recently become legal. Also, among squatter communities, the Tondo dwellers appear to be slightly better off. Most of its workers are employed in the port area or in Manila’s biggest market area. Still, the relatively high valuations tend to substantiate the notion that many

8 Data from developing countries are notoriously unreliable. However, the data gathered for this analysis were collected scrupulously. The same households were also the subjects for RAD’s income and expenditure survey, in which households recorded their incomes and expenditures daily under the supervision of an interviewer. These interviewers then built up trust within the community and were also used to administer the house consolidation surveys.
9 Kain and Quigley.
squatter dwellings are more than makeshift and temporary.\textsuperscript{10} This has important implications for the cost side in the economic evaluation of a project which razes squatter areas.

The mean value owner and appraiser estimates are almost exactly the same. In fact, they are not statistically distinguishable even at the strictest confidence levels. The Philippine sample does well when compared with Kain and Quigley's results for St. Louis differences in average valuations. The conclusion, then, is that, on average, owners value their dwellings consistently with valuations obtained from accepted appraising practices.

For individual estimates, the results are rather different. The average of the absolute value of the differences between owner and app-

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|}
\hline
 & Kain and & Kain and &
\textbf{TABLE I} & Quigley 1972 & Quigley 1972
\textbf{COMPARISON OF INDEPENDENTLY APPRAISED HOUSING} & St. Louis & St. Louis \textbf{VALUES with Owner Estimates} & Study (All & (Single
\textbf{VALUES with Owner Estimates} & Owner- & Occupied & Detached
\textbf{Philippines} & occupied & Homes) & Homes Only)
\hline
1. Average appraised values \( \left( \frac{1}{N} \sum C_i \right) \) ($) & 1,879 & 14,431 & 14,719
\hline
2. Average owner-estimated values \( \left( \frac{1}{N} \sum O_i \right) \) ($) & 1,886 & 14,473 & 14,488
\hline
3. Difference (row 1 - row 2) & -7 & -42 & +231
\hline
4. \% difference (row 3/row 1) & -4 & -3 & +1.6
\hline
5. Absolute value of difference \( \left| \frac{1}{N} \sum C_i - O_i \right| \) & 1.027 & 3.058 & 2.825
\hline
6. Absolute value of difference as a \% of mean appraised value (row 5/row 1) & 54.6 & 21.2 & 19.2
\hline
7. Pearson correlation coefficient & .77 & .87 & .84
\hline
8. Spearman correlation coefficient & .78 & . & .
\hline
9. Sample size & 96 & 113 & 83
\hline
\end{tabular}
\caption{Comparison of Independently Appraised Housing Values with Owner Estimates}
\end{table}

\textsuperscript{10} It should be noted that, in most cities of the developing world, there are two types of squatter communities. One type has the following characteristics: a large number of dwellings; a long history and struggle for services; and a favorable location on large tracts of government or private land. Another type of community typically has no real sense of community and consists of a small number of dwellings perched precariously along railroad rights-of-way, or leaning alongside the wall of a building, or set up in deep gullies. Tondo is of the former variety (Laquian).
praiser valuations is just over US$1,000 for the Philippines sample. This is approximately 55% of the mean appraised value. The comparable figure for Kain and Quigley is approximately 20%. This discrepancy in individual estimates is highlighted in table 2, which tabulates the distribution of differences for the Philippines sample and the two existing U.S. studies. Within the discrete categories of the table, the distribution appears to be approximately bimodal in the Philippines, where three respondents out of four were unable to estimate the value of the home within 30% of an independent appraiser's valuation. On the other hand, both Pearson and Spearman correlation coefficients are relatively high, which indicates that the estimates tend to vary together, in terms of both magnitudes and rankings. An interesting hypothesis is that the use of these estimates as dependent variables in a regression equation of the value of the characteristics of the dwelling units would not lead to very different results.\(^{11}\)

<table>
<thead>
<tr>
<th></th>
<th>Percent</th>
<th>Philippines 1979</th>
<th>St. Louis 1972 Occupiers</th>
<th>U.S. National 1954 Occupiers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.5%</td>
<td>Under 70</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>8.0%</td>
<td>70–89</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>8.0%</td>
<td>90–109</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>9.0%</td>
<td>110–29</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>6.0%</td>
<td>130–149</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>17.0%</td>
<td>150–200</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>24.0%</td>
<td>200 and over</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

\(^{11}\) Note that it is not clear in this case which of the estimates is the "right" one. Although the professional appraiser was a highly skilled structural engineer, she may not have been fully cognizant of the market forces which value dwellings in a squatter community. Thus, this paper has diverged from the convention of the earlier studies, such as Kain and Quigley's by not denoting the difference between the owner and appraiser estimates as "response error." However, for comparative purposes, a regression using income, sex of head, age of house, and housing quality as explanatory variables was used to explain the discrepancies between owner and appraiser estimates. The dependent variables were absolute and relative discrepancies between owner and appraised value estimates. The results (available from the author) revealed that higher-income households tend to "underestimate" with respect to the appraised value of the structure. Sex enters insignificantly in the equations. The coefficient for age indicates that owner valuations deviate more from appraised valuations for older homes. Owners also tend to overestimate for higher-quality homes—which is at variance with Kain and Quigley's findings.
IV. The Determinants of Housing Value

The preceding section established that owners’ valuations of their own dwellings are, on average, the same as the appraisers’ estimations; that these two magnitudes tend to vary together; and that these valuations are relatively large. The next task of this paper is to derive, through hedonic price techniques, which characteristics of squatter dwellings contribute most to housing value, and whether the use of owner versus appraiser valuation changes this relationship. The basic premise of hedonic price analysis is that there exists a reasonably well-fitting relationship between the price of the good in question and the characteristics of that good.\textsuperscript{12} In the most general functional form, this relationship can be represented as:

\[ V = f(C_1, C_2, \ldots, C_N), \]  

where \( V \) is the price (or value) of the house and the \( C \)'s are the characteristics of the house (number of rooms, lot size, etc.). The exact relationship between the characteristics of housing and the price is not known. This paper assumes that this relationship can be expressed in the linear form:

\[ V = p_0 + p_1C_1 + p_2C_2 + \ldots + p_NC_N + \text{error terms}. \]  

This equation can then be estimated by using linear regression analysis (assuming that the errors are randomly distributed and are not correlated with one another). The coefficients of the characteristics can be interpreted as the shadow price of that characteristic, reflecting the interaction of the demander’s bid and the supplier’s offer.\textsuperscript{13}

**Characteristics of Squatter Dwellings**

Squatter communities have been the subject of many studies. However, there has been relatively little done in quantifying the stock of housing in this informal setting. The RAD surveys were able to obtain a fairly complete list of the characteristics of each house. These characteristics, which will be used as independent variables in estimating (2), are described in table 3.

The first observation is that the average dwelling unit’s characteristics do not appear to describe a temporary, makeshift shack, which is the stylized notion of a squatter unit. This observation is consistent with the earlier findings regarding housing value and is most clearly

\textsuperscript{12} See Griliches.

\textsuperscript{13} In order to separate out the demander’s bid from the supplier’s offer, a nonlinear equation is needed. See S. Rosen, “Hedonic Prices and Implicit Markets,” *Journal of Political Economy* 82 (1974): 34–55.
illustrated by the average values of the "quality variables" of table 3. The average age of the structure is almost 12 years, with a range of 2–30 years, attesting to the Tondo community’s ability to survive numerous threats of wholesale eviction. Whether or not structural age is expected to be a proxy for quality and, thus, to vary inversely with its value, as in housing markets of developed countries, needs further discussion. Normally, newly built houses would command the highest prices. If the rate of maintenance does not keep pace with the rate of structural deterioration, all other variables (such as neighborhood quality) constant, depreciation will occur over time. However, age in a squatter community may be an indicator of staying power and the durability of

\[TABLE 3\]

**HOUSING CHARACTERISTICS IN THE TONDO AREA**

(N = 96 HOUSES)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quality:</strong></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>11.6 (8.57)</td>
</tr>
<tr>
<td>CMNTWALL</td>
<td>30 (.47)</td>
</tr>
<tr>
<td>FINWALL</td>
<td>17 (.37)</td>
</tr>
<tr>
<td>SOLIDF</td>
<td>13 (.46)</td>
</tr>
<tr>
<td>QSTRUCT</td>
<td>.013 (1.003)</td>
</tr>
<tr>
<td>QSTAIRS</td>
<td>.004 (.996)</td>
</tr>
<tr>
<td>QFloORS</td>
<td>.014 (.995)</td>
</tr>
<tr>
<td><strong>Size:</strong></td>
<td></td>
</tr>
<tr>
<td>LOT</td>
<td>60.07 (48.44)</td>
</tr>
<tr>
<td>STORY</td>
<td>1.5 (.50)</td>
</tr>
<tr>
<td><strong>Facilities:</strong></td>
<td></td>
</tr>
<tr>
<td>TOILET</td>
<td>44 (.50)</td>
</tr>
<tr>
<td>WATER</td>
<td>54 (.50)</td>
</tr>
<tr>
<td><strong>Neighborhood:</strong></td>
<td></td>
</tr>
<tr>
<td>RICH</td>
<td>45 (.50)</td>
</tr>
</tbody>
</table>

**Note.**—Standard deviations in parentheses. See text for explanation of how these variables were formulated.

14 After a certain point, urban renewal might occur, and the dwelling may be upgraded again. But this would tend to occur only in old buildings (over 35 years) and is a fairly recent phenomenon in the central core of older American cities.
the structure. In fact, since many dwellings are built by self-help methods, progressive development is probably prevalent. Households would build their dwellings slowly over time, as their resources allow them. Thus, age might point to a larger and/or higher-quality house simply because a household (or succeeding occupants) has had the time to put more work and materials into it. Thus, it is hypothesized that a positive relationship between age and value could exist for the squatter dwellings in the sample.

More direct quality measures were also obtained by the survey. The next three variables of table 3 describe the materials used in housebuilding. The variables CMNTWALL, FINWALL, and SOLIDF take on the value of unity when the dwelling is characterized, respectively, by cement walls, finished (painted) outside walls, and a concrete foundation. Otherwise, the value of the relevant variable is zero. The average values of these dummy variables indicate that 30% of the sample have cement walls—cement is usually the highest-quality material used in these communities, since wooden walls usually mean scrap planks. About 80% do not have finished walls, and 70% of residents do not have dwellings built on solid foundations. Housing value is expected to be directly related to all three variables.

The surveys also obtained a large amount of information on the quality (i.e., the present condition) of the houses. Interviewers were asked to rate the dwellings from zero to three, depending on certain structural conditions. For example, one variable was called "wear on floors." If a dwelling unit had a dirt floor, it was assigned a value of zero. If there was very substantial amount of wear, the variable was assigned a value of one. Moderate wear was worth a value of two, and nearly three. There are 16 other such variables in the data base. They are listed under table 4.

Because the inclusion of all these variables would severely restrict the estimating equation’s degrees of freedom, certain summary indices of quality had to be constructed. There is no reason to believe that these value judgments can simply be added up. Thus in the manner of Kain and Quigley,15 factor analysis was used to combine them into indices which can be easily interpreted. Table 4 summarizes the three-factor solutions for the 17 variables. Two-, four-, and five-factor solutions were also attempted, but they did not result in variable combinations which explained the variation of the components better, nor were these combinations easily interpretable. The factor loadings indicate the correlation between the factor and the component variables. In table 4, there are three groups of variables. Factor 1 can be termed the

outside structural quality of the unit. It measures the quality of the walls, windows, doors, roofs, and foundations. It is called \textit{QSTRUCT}. Factor 2 loads heavily on variables which have to do with the quality of the steps. It is coded \textit{QSTAIRS}. Finally, factor 3 loads heavily on the quality of the floors, and it is coded as \textit{QFLOORS}. All three are expected to be positively related to housing value.

The second group of variables described in table 3 are those which describe the size of the dwellings. Once again, the numbers indicate that the stylized view of the squatter unit is misleading. The average lot size is approximately 61 square meters, which is not an insignificant size. This quantity is, of course, the size perceived by the owner, since there are no titles. However, in Tondo, titles are not necessary since neighbors appear to be aware of the boundaries of the lots, although there are probably many overlapping claims. Houses of more than one story are also very much in evidence in Tondo. Approximately half the sample units have more than one story. Size is obviously expected to vary directly with value.

The third group of variables of table 3 indicates the existence of sanitary and water-related facilities in the squatter household. The variables \textit{TOILET} and \textit{SINK} equal one when these facilities, respectively, are present in the dwelling unit. The differences between formal housing and squatter communities are most evident when one examines these variables. Over half of the families have no toilet

\begin{table}
\centering
\caption{Factor Loadings on Individual Quality Variables}
\begin{tabular}{lrrr}
\hline
Variables & Factor 1 & Factor 2 & Factor 3 \\
\hline
VAR063 & Wear on floors & - & 0.94394 \\
VAR064 & Defects on floors & - & 0.94613 \\
VAR065 & Sagging or bulging floors & - & 0.91645 \\
VAR066 & Wear on steps & - & 0.93917 - \\
VAR067 & Defects on steps & - & 0.95275 - \\
VAR068 & Unsafe steps or railing & - & 0.92148 - \\
VAR069 & Defects on ceiling & - & - \\
VAR070 & Defects on inside walls & 0.69608 & - \\
VAR071 & Broken, missing windowpanes & 0.80596 & - \\
VAR072 & Rotted, loose window frame & 0.79213 & - \\
VAR073 & Deep wear on doorsill, frames & 0.76212 & - \\
VAR074 & Sagging, bulging outside walls & 0.80229 & - \\
VAR075 & Defects on outside walls & 0.80669 & - \\
VAR076 & Sagging, bulging roof & 0.61832 & - \\
VAR077 & Defects on roof & 0.51990 & - \\
VAR078 & Defects in foundations & 0.64005 & - \\
VAR079 & Rotted gutters and downspouts & - & - \\
\hline
\end{tabular}
\end{table}

\textit{Note}.—A minus sign indicates a standardized factor loading less than 0.5.
facilities at all. A similar percentage do not have a sink, which is a proxy for individual water connections.

Finally, $RICH$ is a rough measure of neighborhood effects. This is a dummy variable which takes on the value of unity if a household’s house is in a superblock with an average monthly household income which exceeds the mean. Subjective information regarding neighborhood conditions was not available. No measures of location were available. This possible source of bias is minimal because all of the dwellings in the sample were located within the Tondo area, which is fairly confined. A great majority of the heads of households do not have to commute to the workplace.

Results

Table 5 presents the main results of the hedonic equation estimation with the variables described earlier. Linear and nonlinear specifications (with respect to age, $AGE2$, and lot size, $LOT2$) are used, and $\beta$ coefficients, which standardize for the unit measures, are also shown. The two dependent variables are $OWNRVAL$, which is owner’s own valuation of the worth of the dwelling unit, and $CONSVAL$, which is the appraiser’s valuation. The overall results appear to be similar when a comparison is made between the coefficients of equations with different dependent variables, although no exact econometric test is possible. The signs and magnitudes are roughly of the same order of magnitude. Also, the relative ranking of the contributions of the various characteristics to housing value is not changed by large amounts. The rank-order correlation (Spearman’s $\rho$) between the $\beta$ coefficients of the nonlinear specifications of the equations using $CONSVAL$ and $OWNRVAL$ is .66.

The signs of the coefficients conform to expectations, except for $AGE2$ and $TOILET$ in the nonlinear specification of the owner’s valuation. Although its significance level is relatively low, the positive coefficient for $AGE$ suggests that progressive development or the lessened degree of risk signaled by age or both are having some effect. The sign is maintained throughout the regressions. This can be contrasted to findings for more developed countries, where the age coefficient is consistently negative and significant.\(^{17}\)

\(^{16}\) Tondo has been divided into 24 “superblocks” of approximately 700–800 families each to facilitate project implementation.

### TABLE 5

**Hedonic Price Equations**

<table>
<thead>
<tr>
<th>Housing Characteristics</th>
<th>Dependent Variable = OWNRVAL</th>
<th></th>
<th></th>
<th></th>
<th>Dependent Variable = CONSVAL</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \hat{\beta} )</td>
<td>( \hat{\beta} )</td>
<td>( \hat{\beta} )</td>
<td>( \hat{\beta} )</td>
<td>( \hat{\beta} )</td>
<td>( \hat{\beta} )</td>
<td>( \hat{\beta} )</td>
<td>( \hat{\beta} )</td>
</tr>
<tr>
<td>Constant ..............</td>
<td>-12,505.18*</td>
<td>-13,800.29*</td>
<td>-11,760.84*</td>
<td>-16,006.81*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6074.47)</td>
<td>(8088.07)</td>
<td>(5,938.35)</td>
<td>(7,922.52)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE ..............</td>
<td>252.38*</td>
<td>132.20</td>
<td>11.13</td>
<td>304.18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(186.65)</td>
<td>(718.79)</td>
<td>(182.47)</td>
<td>(703.19)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE2 ..............</td>
<td>...</td>
<td>2.74</td>
<td>...</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>(21.36)</td>
<td>...</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMNTWALL ..............</td>
<td>9.7555*</td>
<td>10.233</td>
<td>7.71780</td>
<td>8.28538</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4,033.39)</td>
<td>(4,131.88)</td>
<td>(3,943.01)</td>
<td>(4,047.30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FINWALL ..............</td>
<td>7.5629</td>
<td>6.10244</td>
<td>16.99820</td>
<td>16.76039</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4,586.22)</td>
<td>(4,843.03)</td>
<td>(4,483.45)</td>
<td>(4,743.90)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QSTRUCT ..............</td>
<td>967.98</td>
<td>1,059.93</td>
<td>1,840.39*</td>
<td>1,755.75*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1,543.07)</td>
<td>(1,561.48)</td>
<td>(1,508.49)</td>
<td>(1,565.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOLIDF ..............</td>
<td>8,820.92</td>
<td>7,928.54</td>
<td>9,294.42</td>
<td>9,088.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4,701.87)</td>
<td>(4,814.32)</td>
<td>(4,596.51)</td>
<td>(4,715.78)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QFLOORS ..............</td>
<td>1,406.43</td>
<td>1,283.93</td>
<td>3,634.43</td>
<td>3,567.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1,582.58)</td>
<td>(1,597.70)</td>
<td>(1,547.12)</td>
<td>(1,565.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QSTAIRS ..............</td>
<td>1,018.30</td>
<td>933.11</td>
<td>927.39</td>
<td>826.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1,494.18)</td>
<td>(1,509.33)</td>
<td>(1,460.70)</td>
<td>(1,478.43)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOT ..............</td>
<td>4.30*</td>
<td>10.67</td>
<td>10.63</td>
<td>13.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.97)</td>
<td>(7.15)</td>
<td>(2.91)</td>
<td>(7.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOT2 ..............</td>
<td>...</td>
<td>-0.01</td>
<td>...</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>(-0.001)</td>
<td>...</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STORY ..............</td>
<td>5,611.96</td>
<td>6,139.81</td>
<td>7,380.79</td>
<td>7,650.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3,326.67)</td>
<td>(3,939.49)</td>
<td>(3,325.12)</td>
<td>(3,324.03)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOILET ..............</td>
<td>587.05</td>
<td>-170.15</td>
<td>1,242.75</td>
<td>1,087.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3,510.69)</td>
<td>(3,612.87)</td>
<td>(3,432.03)</td>
<td>(3,538.92)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER ..............</td>
<td>6,696.91*</td>
<td>5,647.51</td>
<td>1,167.66</td>
<td>938.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4,254.75)</td>
<td>(4,408.05)</td>
<td>(4,159.40)</td>
<td>(4,317.82)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RICH ..............</td>
<td>5,035.87</td>
<td>4,950.44</td>
<td>1,172.20</td>
<td>2,171.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2,802.67)</td>
<td>(3,119.79)</td>
<td>(2,759.86)</td>
<td>(3,055.93)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R2 ..............</td>
<td>.51</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N ..............</td>
<td>96</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F ..............</td>
<td>7.21</td>
<td>6.18</td>
<td>15.21</td>
<td>12.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Standard errors are in parentheses; \( \hat{\beta} \)'s are coefficients of standardized variables.

* Coefficients larger than standard error.

* Significant at .10 confidence levels (two-tailed test).
Housing-quality variables seem to be the more important determinants of value. A concrete wall and some sort of finish on that wall enhance the value considerably. The $\beta$ coefficients for CMNTWALL and FINWALL consistently rank highly in the equations. (Many studies in the U.S. found the same result for paint or a brick exterior; see studies cited in n. 17.) In flood-prone Tondo, having a solid foundation is, not surprisingly, strongly correlated with value. The variables which account for the maintenance of a dwelling unit (QSTRUCT and QFLOORS) perform poorly in the owner equations but not in the appraiser equations. It may be, for example, that owners do not value maintenance or at least tend to associate it with the durability of materials used in the house.

Although the price of the land in this squatter community is presumably nil to the households, the extent of the lot seems to have a great deal to do with housing value. Like homesteaders, squatter families are very quick to stake out a claim to the land, and the lot sizes vary. The boundaries appear to be respected in Tondo, as long as they are within reason and the owner can justify the claim by force or moral suasion. The evidence indicates that homeowners feel that an additional square meter of space adds 4–11 pesos to the value of the house. It is interesting to note that the government’s urban development project eventually sold the land to the squatters at a highly subsidized rate of 5 pesos per square meter, as agreed over 15 years ago.

Surprisingly, the variables which measure service levels do not enter into the equation very significantly. In particular, sanitary facilities do not appear to add much to explaining the variance in either the owner’s or the architect’s valuation. This may simply be a reflection of tastes, as conditioned by the relatively little familiarity these residents have with toilet fixtures and their importance for sanitation. This might have grave implications for projects which provide these facilities. Greater attention may have to be paid to teaching their value and use, through education components added to the projects. Simply providing the facilities may not be sufficient to induce intended health benefits.

V. Conclusions
Squatter communities have not been included in the housing statistics of many developing countries. Yet they constitute a large portion of urban dwellers, and the dwelling units are obviously not without value. It is important to estimate the determinants as well as the magnitude of those values to use in the evaluation of housing and urban development.

---

projects or for eventual use in housing-demand studies. This paper uses data from the Philippines to determine whether the squatter-owner’s valuation of his own house compares with that of an independent appraiser. The results show that, while the discrepancies in the estimates are quite large for individual properties, they are largely offsetting for reasonably sized samples. This tends to confirm earlier findings for the United States by Kish and Lansing and by Kain and Quigley for conventional housing. In addition, it is shown that the two estimates are highly correlated with one another and yield similar results when they are used as dependent variables in a hedonic price equation. The determinants of the value of squatter dwellings tend to be similar to those of conventional formal sector dwellings. The external appearance and quality of materials used in construction are among the most important variables. Water and sanitary facilities may not be valued as much as expected in the market. Finally, there is preliminary evidence that age may be positively correlated with value, because housing services are improved more gradually in squatter communities and because longevity in a particular area is a sign of reduced risk. Overall, it can be stated that squatter housing markets appear to behave as economically rational entities which value dwelling units similarly to conventional markets. They should be accounted for in any analysis regarding housing markets in developing countries, and it appears that simple household surveys would be reasonably effective in obtaining the requisite information for such work.
No. 225. George Psacharopoulos, "The Economics of Higher Education in Developing Countries," *Comparative Education Review*

No. 226. Katrine Anderson Saito and Delano P. Villanueva, "Transaction Costs of Credit to the Small-scale Sector in the Philippines," *Economic Development and Cultural Change*


No. 230. Abdun Noor, "Managing Adult Literacy Training," *Prospects*


No. 233. Keith Bradley and Alan Gelb, "Motivation and Control in the Mondragon Experiment," and "The Replication and Sustainability of the Mondragon Experiment," *British Journal of Industrial Relations*


No. 241. Bela Balassa, "Disequilibrium Analysis in Developing Countries: An Overview," *World Development*


Issues of the World Bank Reprint Series are available free of charge from the address on the bottom of the back cover.