PRICE HETEROGENEITY AND "REAL" INEQUALITY: A CASE STUDY OF PRICES AND POVERTY IN RURAL SOUTH INDIA

BY VIJAYENDRA RAO

The World Bank

This paper, based upon a case-study of three Indian villages, studies whether households within the same market pay different prices for identical goods. It is found that not only are unit prices for food heterogeneous, but that the poor pay more for the same goods than the rich. This is because liquidity constraints force poorer households to purchase goods in small quantities and consequently subject them to quantity premiums. Household specific index numbers are used to adjust nominal incomes to real values and it is found that Gini coefficients of real incomes are between 12 percent to 23 percent greater than the Gini for nominal incomes. An econometric analysis of the determinants of prices shows that incomes are negatively correlated with prices, as is family size, but that the amount of land owned shows a positive relationship.

1. INTRODUCTION

Despite a long tradition in economics that analyzes the variation of prices across consumer units, most studies of poverty and inequality assume that all families in one market face the same set of retail prices. However, studying such price heterogeneity is crucial to understanding the nature and extent of inequality and poverty. If the poor pay more for the same goods than the rich, then in real terms the poor would be even poorer than their income levels might suggest implying that *real* inequality would be greater than measured inequality. Moreover, if prices are income dependent, Van Praag and Baye (1990) show that there is often no such thing as a unique poverty line, but a multiplicity of income-specific poverty lines that depend upon the relationship between prices and incomes. Income dependent prices also have obvious and serious implications for identification in demand systems.

There are good reasons to believe that the poor face higher retail prices than the rich, particularly in developing countries. The poor face greater liquidity constraints and may consequently purchase food in very small quantities resulting in higher unit prices. While there is a theoretical literature on price differentials across consumers units, the empirical literature, particularly in developing countries, is not as extensive.[1] The U.S. literature focuses on store-level data (e.g.: Alcaly, 1976; Macdonald and Nelson, 1991), with one exception that looks at a small sample of households in New Haven (Kunreuther, 1973). The only

[1]See Anglin and Baye (1988) for theoretical work on the subject.

201

published analysis for a developing country, that I am aware of, is a paper by Musgrove and Galindo (1988) on Brazil that also uses store level data.

One reason why empirical studies of unit price differentials at the household level are scarce is that such data are difficult to come by because conventional surveys do not collect them. While it is possible to calculate unit prices from information on expenditures and quantities, these data usually do not permit quality differences within a good to be identified. This makes it difficult to ask the question that is the focus of this paper; whether the poor pay different prices than the rich for *identical* goods. I attempt to correct this by using a unique set of data that I collected employing ethnographic methods along with a survey instrument. The questionnaire was specially constructed to collect information on unit prices paid by families for retail goods. The data are from a community of potters spread across three villages in Karnataka State in Southern India.

The paper will present both qualitative and quantitative evidence to provide some insights into the nature of the retail market in these villages. I will construct household specific price indices which will be used to convert nominal incomes to real values that better reflect a household's true purchasing power. To examine the impact of this adjustment, I will compare the distribution of nominal incomes and real incomes. Finally, I will econometrically examine the determinants of unit prices paid by households.

2. DESCRIPTIVE ANALYSIS AND SURVEY DATA

There are three villages in the sample Halli, Beedu and Ooru.[2] Halli is a large multi-caste village close to Mysore, a growing city with 3.2 million people, and those residents of Halli who can afford the 30 minute bus ride do some of their shopping in Mysore. Most retail purchases, however, are made in one of about 15 small retail shops in the village that range from a large shop stocking a variety of grains, pulses, legumes, and toiletries, to small shops that sell sweets, beedis and cigarettes. The public distribution system is represented in the village by a "Fair Price" shop run by the state government that is supposed to sell rice, sugar and palm oil at prices regulated by the government in rationed amounts. The shop, however, opens only once a month and even then it tends to only have some poor quality rice available.

The second village Ooru, which is about 40 kilometers away from Halli, is also a large village with a retail market that is very much like Halli's with a mix of large and small shops. Ooru also has a Fair Price shop but the shopkeeper, who comes from a powerful family in the village, does not sell goods at the regulated prices but at much higher open market rates. Beedu, the third village, is in the middle of a coffee growing region and thus has ample opportunities for wage labor. There is just one well stocked shop in the village that sells all the major grains, pulses, legumes, some vegetables, and toiletries, two other small shops that sell some tea, candy and cigarettes and a Fair Price shop that sells limited quantities of poor quality rice and jaggery.[3]

[2]The names of the villages are aliases.
[3]However, the village has three liquor shops.

202

Beedu village is populated entirely by potters, but in Halli they are about 10 percent of the population, and about 13 percent in Ooru. The potters are among the poorer groups of the 10 or 11 sub-castes that constitute the populations of Halli and Ooru. There is, however, some diversity in income and wealth within the potter community with the Gini coefficient of nominal household income per adult equivalent at 0.257 which is less than the Gini coefficient for rural Karnataka at 0.292 (Pal and Pant, 1993).[4] Thus, if income-dependent price differentials exist within the potter community, one would expect this to be even more true of the general population with its greater heterogeneity.

Only about 20 percent of the potters practice pottery now, and the majority are wage laborers paid once a week. Wages for labor are between 15–20 rupees ($1.70–$2.30 in PPP adjusted U.S. dollars)) a day for men and between 12–15 (PPP $1.36–$1.70) rupees a day for women. About 40 percent of the potter families in these villages own small plots of land, about 75 percent of which are of less than one acre. Most of the land is used to produce food for self consumption. The average family in this community is not wealthy with family incomes averaging Rs. 314 (PPP $35.64) a week which works out to Rs. 79 (PPP $8.97) per adult equivalent. Credit markets are also rather restrictive. Local money lenders charge interest rates of between 100–300 percent, making it far too expensive to borrow money for short-term food purchases. Some shopkeepers provide food on credit on some occasions but they do so primarily to customers with steady sources of income or other resources, and thus deny access to the poorest families.

Therefore, poorer potters, particularly those who engage in wage labor as a primary source of income, purchase food when they have the cash to do so. This is one of the reasons why the Fair Price shops are ineffective. The entire allocated ration in these shops *has* to be purchased once a month. Many of the poor do not have the cash on hand for this and are consequently forced to resort to the open market. Moreover, the Fair Price shops in these villages do not always have goods in stock, and do not always sell what they have at the government regulated "fair price." Even on good days when the Fair Price shops are relatively well stocked they sell rice and some sugar of such poor quality that it inspired one respondent to say, "If I want to eat stones and maggots I can pick them off the ground and don't have to buy them from ration shops." Thus, the public distribution system is rather ineffective and households purchase most of their food in the open market.

The ineffectiveness of the public distribution system combined with severe liquidity constraints induce poorer households to make their purchases when they have enough cash on hand. Consequently they often have to purchase food in extremely small quantities. Consider the purchases of a young couple with a four year old child: They buy 7 kg of poor quality rice, small quantities of pulses— 100 g of yellow split peas (toor dal), 100 g of horse gram (hurli), and 100 g of Bengal gram—along with 100 g of cooking oil and a few vegetables during one weekly shopping trip. Yellow split peas, which usually costs about Rs. 28 a kg, costs Rs. 3.50 for a purchase of 100 g increasing the unit price by 25 per cent,

[4]Based on 1987–88 data. The Gini coefficient for all of rural India is 0.291, and 0.352 for urban India (Pal and Pant, 1993).

horse gram which usually sells at Rs. 6 per kg, is sold at Rs 1.00 per 100 g, a unit price mark-up of 40 per cent, and Bengal gram is sold at Rs. 2.50 for a 100 g purchase which is mark-up of 15 percent above the price per kg. Rice, vegetables and cooking oil do not show much of a mark-up, and yet, because of higher pulse and legume prices, this household pays considerably more for the basket of goods that it purchases.

I found that similar mark-ups were charged for many other commodities purchased in small amounts, and while prices of goods sold in smaller quantities were not posted, they were well understood by both buyers and sellers. Interviews with individuals who did the food shopping (usually one of the adult women) revealed that they were well aware of the higher unit prices that they were paying by making small purchases. However, they expressed a great deal of helplessness about the situation saying that the lack of a steady cash flow made them unable to find the money to buy food in large enough quantities to take advantage of lower prices. Some households, usually connected by close kinship ties, form shopping groups and pool their resources together to purchase food in larger quantities in order to take advantage of lower unit prices. However, the opportunities for this are limited. Time constraints and irregular incomes make it difficult to coordinate a group shopping trip. Such shopping groups require relatively long term commitments by participants to be sustainable and the uncertainty and irregularity of incomes make commitments difficult.[5]

To examine the magnitude of these effects a census survey of all 140 potter families in these three villages was conducted in July 1994. The survey instrument elicited information on quantities and expenditures of all the possible foods consumed by these households in the week prior to the survey. Care was taken to differentiate between different quality grades of the same commodity to isolate the price paid for the same commodity across different income classes. Each response was also cross-checked by asking respondents if the unit price implied by their responses to the quantity and expenditure questions was accurate. Additionally, information was collected on household incomes in the past week with values of self-produced food imputed with the prevalent selling price, along with other demographic and socio-economic variables.[6]

Clearly a small case study of this kind represents a trade-off. While it enables an in-depth portrait of a community using personal interviews, participant observations and specialized survey instruments that require some care to administer and consequently yield rich and intimate data, the quality of the data is traded off with the statistical representativeness of a large survey. However, the nature of the retail market in these villages is quite typical of villages in Karnataka state.

[5]In theory it is possible that the mark-ups represent losses from storage costs and depreciation faced by shopkeepers making small sales. However, given that the goods most subject to price effects are dry pulses that are relatively easy to store, this is not likely to be a major contributing factor.

[6]There was also some heterogeneity in prices on the supply side, with larger farmers able to command better prices for their output.

3. QUANTITATIVE METHODOLOGY

A Laspeyres' price index, denoted as I_j, is calculated for each household to get a summary measure of the price level it faces

$$(1) \qquad I_j = \frac{\sum_{i=1}^{K_J} p_i^j q_i^0}{\sum_{i=1}^{K_J} p_i^0 q_i^0} \times 100.$$

where i indexes commodities and j indexes households. p_i^j is the unit price paid by household j for commodity i and q_i^0 is the quantity purchased of commodity i by the median household in the sample, similarly p_i^0 is the unit price paid by the median household for commodity i. Thus, the construction of the index number follows a version of the Laspeyres format using the budget of the median household as the base. While information was collected on over twenty food items, 14 commodities were used in the index number calculation omitting those that were consumed by less than 20 households. These fourteen commodities represent over 70 percent of the average household's budget.[7]

However, even after limiting commodities to those consumed by over 20 households, many families purchased less than the full set of fourteen commodities. In other words, for many households, p_i^j is not defined for all goods. This problem does not have an easy solution, and a simple strategy was chosen which limited the base budget used in the denominator for each household to those commodities purchased by that household.[8] Thus, i is defined from 1 through K_j where K_j is the number of commodities consumed by household j. With this method an index number I_j is defined for all the households in the sample and is a summary measure of the ratio of prices faced by each household to median prices paid in the sample. Thus, the median household's index number is 100, a household with an index of 200 faces prices that are double the sample median, and a household with an index number of 50 pays prices that are half the sample median.[9]

Two types of index numbers are calculated: An All Goods Index using all fourteen goods, and an Open Market Index focusing on goods purchased in the open market and imported into the village economy. The Open Market Index excludes rice purchased from Fair Price shops and pearl millet (ragi)—an inexpensive locally produced staple grain. Using household specific index numbers, nominal incomes are converted to real values. Gini coefficients are then calculated for

[7]Meats, fruits, vegetables and tobacco were also omitted because it proved very difficult to get enough observations of separate prices for each type of meat, fruit, vegetable and tobacco product. However, the qualitative evidence suggests that all of these commodities also were subject to quantity discounts. Cigarettes for instance are often sold in singles at prices that are about three times as high as purchasing a pack. Households who purchase a single orange are charged about one and a half times the price of a dozen.

[8]While not a perfect solution, it serves the purpose of calculating an index number which measures prices for the reference household relative to the median prices paid in the sample. Note that poorer households are most likely to be subject to any biases caused by this method because some goods are too expensive for them to purchase. If they had purchased these goods it is likely that they would have purchased these goods in small quantities, and would have consequently paid higher unit prices for them. Thus, the biases caused by this method are unlikely to dampen the substantive results of this paper—that the poor pay higher prices.

[9]Note that the "median household" does not actually exist because one household does not pay the median price for all goods.

both nominal and real incomes to estimate the extent to which income-dependent prices bias inequality measures.

If unit prices are higher for smaller purchases, the household can no longer take prices as given but will face a function

$$(2) \qquad p_j^i = p(q_j^i, D_j)$$

in the budget constraint that allows for the dependency of prices on quantities purchased. D_j represents village dummies to allow for the fact that each village represents a separate retail market. Reduced form demand functions derived from such a maximization problem would have the following form:

$$(3) \qquad q_j^i = q^i(Y_j, S_j, L_J, D_j).$$

Where q_j^i is the quantity of good i purchased by household j in the past week, Y_j is the family's weekly income, and S_j and L_j are taste-shifting variables denoting family size measured by the number of adult equivalents in the family, and the amount of land owned by the family respectively.[10] (3) can be substituted in (2) to get a reduced form expression of the determinants of household specific prices:

$$(4) \qquad p_j^i = p^i(Y_j, S_j, L_J, D_j).$$

Where p_j^i is the price paid for good i by household j. Estimates of (2) will not be presented because of the unavailability of adequate instruments to identify the relationship between prices and quantities. I will present OLS estimates of (4), the reduced form determinants of household specific prices, with heteroskedasticity corrected standard errors. (4) will be estimated for the whole sample using household specific price indices I_j for all goods, and for open market goods, as dependent variables.

4. ECONOMETRIC RESULTS

Table 1 reports means and standard deviations of some key variables. Note that both the All Goods Index and the Open Market Index display considerable variation showing that price heterogeneity is widespread. The price and quantity data for food purchases indicate the sources of this variation. Prices for goods that are either locally produced or easily available in fair price shops like rice and sugar have the lowest variation with small standard deviations relative to the mean. On the other hand pulses and legumes which are also widely consumed, but expensive and usually purchased in small quantities, show the highest variation in prices. This explains why the Open Market Index, which is more sensitive to pulse and legume prices, displays greater income dependency. Translating this into nutritional terms, this indicates that foods that provide carbohydrates do not show much price variation, but goods like pulses and legumes which are a major source of protein, show more price variability and their prices depend on the quantity purchased.

---

[10]Adult equivalents are defined as 1 for members of the household older than 12, 0.5 for children between 7 and 12, and 0.25 for children younger than 7.

TABLE 1

MEANS AND STANDARD DEVIATIONS OF VARIABLES
(All Income, Price and Quantity Variables are For a One Week Period)

Variable	No. of Obs.	Mean	Std. Dev.
All good price index	138	99.2	13.1
Open market price index	138	99.8	13.6
Beedu village	138	0.4	
Ooru village	138	0.3	
Halli village	138	0.3	
Nominal weekly household income (Rupees)	138	314.6	307.5
Per capita nominal weekly income (Rupees)	137	79.4	47.5
Real weekly household income adjusted with all goods index (Rupees)	138	335.8	371.5
Real weekly household income adjusted with open market index (Rupees)	136	338.1	364.6
Real per capita income adjusted with all goods index (Rupees)	137	82.9	55.9
Real per capita income adjusted with open market index (Rupees)	135	82.7	56.2
Number of adult equivalents	139	3.8	1.5
Land owned by the family (acres)	152	0.6	1.2
Price per kg. of open mkt good rice (Rs.)	45	8.1	0.8
Qty. purchased open market good rice(kg.)	138	3.3	5.4
Price per kg. of fair price rice (Rs.)	47	5.3	1.1
Qty.purchased of fair price rice (kg.)	138	1.9	5.3
Price per kg. of poor raw sugar (Rs.)	35	10.9	1.9
Qty. purchased of poor raw sugar (kg.)	138	0.3	0.6
Price per kg. of good raw sugar (Rs.)	39	10.9	2.0
Qty. purchased of good raw sugar (kg.)	138	0.5	1.4
Price per kg. of toor dal (Rs.)	122	27.0	7.4
Qty. purchased of toor dal (Rs.)	138	0.3	0.3
Price per kg. of bengal gram (Rs.)	104	19.3	5.1
Qty. purchased of bengal gram (Kg.)	138	0.2	0.2
Price per kg. of black gram (Rs.)	40	17.7	5.6
Qty. purchased of black gram (Kg.)	138	0.1	0.2
Price per kg. of moong dal (Rs.)	77	14.7	6.6
Qty. purchased of moong dal (Kg.)	138	0.3	0.4
Price per kg. of flat beans (Rs.)	85	9.0	3.0
Qty. purchased of flat beans (Kg.)	138	0.3	0.3
Price per liter of milk (Rs.)	96	6.2	1.7
Qty purchased of milk (Liters)	138	1.5	1.6
Price per egg (Rs.)	64	1.3	0.2
Qty. of eggs purchased	138	2.8	3.8
Price per kg. of cooking oil (Rs.)	116	40.4	7.0
Qty. purchased of cooking oil (Kg.)	138	0.3	0.9

Does this variation in unit prices faced by households have an impact on the distribution of income? Table 2 presents percentile groupings for weekly household income in nominal values, and two sets of real values one calculated with the All Price Index and the other with the Open Market Index. The median nominal income is Rs. 260.60, and median real incomes are lower at Rs. 252.64 with the All Price Index and Rs. 253.75 using the Open Market Index. The distribution of income is clearly more unequal for the two real income measures: Gini coefficients for nominal incomes are 0.348, they increase by 12 percent to 0.39 for real incomes with the All Price Index and by 17 percent to 0.406 for real incomes with the Open Market Index.

TABLE 2

PERCENTILES OF NOMINAL AND REAL WEEKLY FAMILY INCOMES

Nominal Weekly Family Income (Gini = 0.348)		Real Weekly Family Income, Adjusted by All Price Index (Gini = 0.390)		Real Weekly Family Income, Adjusted by Open Market Index (Gini = 0.406)	
Percentiles	Income (Rs.)	Percentiles	Income (Rs.)	Percentiles	Income (Rs.)
1	60.00	1	59.65	1	56.75
5	73.00	5	71.63	5	87.63
10	123.50	10	113.07	10	118.79
25	184.50	25	178.50	25	175.79
50	260.60	50	252.64	50	253.75
75	349.50	75	384.56	75	391.73
90	507.00	90	567.14	90	567.14
95	598.50	95	713.79	95	713.79
99	2097.00	99	2096.79	99	2096.79

Households are quite heterogeneous in size, however, and per capita incomes are a more accurate measure of living standards than total household income. Table 3, therefore, focuses on incomes per adult equivalent.[11]

Here again inequality in real incomes is greater than inequality in nominal incomes. The Gini coefficient for nominal incomes per adult equivalent is 0.257, this increases by 12 percent to 0.288 for real incomes adjusted with the All Price Index, and is even higher for real incomes with the Open Market Index at 0.316 which is 23 percent greater than the nominal per capita income Gini. An examination of the percentile distribution of incomes shows why the Gini coefficients are changing. Focusing on the adult equivalent incomes, the 1st percentile stays about the same at approximately Rs. 24 for all three income measures. However incomes between the 5th and the 25th percentile are all smaller for the real income measures, while incomes between the 75th and the 99th percentile are all higher.

TABLE 3

PERCENTILES OF NOMINAL AND REAL WEEKLY INCOME PER ADULT EQUIVALENT

Nominal Per Capita Income (Gini = 0.257)		Real Per Capita Income, Adjusted by All Price Index (Gini = 0.288)		Real Per Capita Income, Adjusted by Open Market Index (Gini = 0.316)	
Percentiles	Income (Rs.)	Percentiles	Income (Rs.)	Percentiles	Income (Rs.)
1	24.44	1	23.88	1	23.88
5	36.25	5	35.61	5	32.49
10	42.50	10	40.95	10	40.00
25	56.06	25	56.54	25	52.69
50	70.18	50	69.71	50	70.33
75	88.68	75	90.64	75	90.33
90	116.38	90	123.95	90	124.24
95	137.09	95	186.56	95	188.81
99	298.07	99	377.66	99	359.26

[11]Children below 4 were treated as 1/4 adults, while children between 4 and 8 were treated as 1/2 adults, and children between 8 and 14 were treated as 3/4 adults.

Note that the median income stays at about Rs. 70 for all nominal and real incomes. This clearly indicates that the poor pay higher prices than the median while the rich pay lower prices than the median suggesting that measures of income distribution that do not account for price heterogeneity may understate the extent of inequality.

The effects on poverty are more complex because income dependent prices introduce the possibility of income-specific poverty lines. Van Praag and Baye (1990) develop a numerical method to calculate an income-gap poverty measure with income dependent prices, but their method requires regularity assumptions on the price-income relationship that are difficult to justify with these data. Developing implementable measures of poverty when prices depend upon incomes because of quantity discounts, such as those outlined in this paper, will require more conceptual work and larger sample sizes. Future work will also have to examine how income dependent prices influence different types of poverty measures.

To examine the extent of the dependency between prices and income and to look at some other correlates of price heterogeneity, Table 4 presents estimates of equation (4) the reduced form price function.[12]

TABLE 4

REDUCED FORM PRICE REGRESSIONS WITH INDEX NUMBERS
(Absolute Value of t-statistics in parenthesis, Std. Errors are Heteroskedasticty Corrected)

Variable ($n = 138$)	Log Index for All Goods		Log Index for Open Market	
Beedu village	0.036	0.043	0.028	0.036
	(1.7)	(2.0)	(1.3)	(1.8)
Ooru village	− 0.046	− 0.036	− 0.046	− 0.035
	(1.3)	(1.0)	(1.3)	(1.0
Log nominal weekly family income (Rs.)	− 0.064	− 0.036	− 0.098	− 0.074
	(3.1)	(1.3)	(4.2)	(2.1)
Land owned by family (acres)	—	0.010	—	0.012
		(1.6)		(1.9)
Adult equivalents	—	− 0.018	—	− 0.017
		(1.6)		(1.5)
Intercept	4.942	4.844	5.142	5.059
	(40.4)	(35.6)	(37.6)	(33.5)
$\bar{R}^2$	0.15	0.16	0.20	0.22

Focusing first on the regression for the All Goods index, notice that it has an elasticity of − 0.064 with a 1 percent level of significance. Thus a doubling in income results in a 6.4 percent decrease in the prices faced by the household. However, when the two other explanatory variables, land and number of adult equivalents in the family, are included in the regression the income elasticity drops to − 0.036 and is not significant. This suggests that land ownership and family size may be influencing the relationship between income and prices because land

[12]Means and Standard Deviations of variables used in all the regressions are given in Table 1.

size is positively correlated with the price level while family size is negatively correlated with it.[13]

These effects are stronger for the regression on the Open Market Index. Even after controlling for Land ownership and family size, incomes have a significantly estimated elasticity of −0.074. An additional acre of land significantly increases the index by 1 point. On the other hand an additional adult in the household reduces the index by about 1 point, though this effect is not significant. This suggests that households with more land pay higher prices, as, to some extent, do households with smaller families. Both of these effects have a quantity premium explanation. Note that the majority—over 40 percent—of the families in this sample have plots of land that are less than half an acre in size. The mean plot size is 0.58 acres, and the correlation between land and total expenditures is low at 0.17. Thus, families with land are likely to be poor subsistence farmers who depend less on the market for their food, and, everything else equal, purchase smaller amounts in the open market and thus pay higher unit prices. However, larger families need to purchase larger quantities, and thus are able to take advantage of lower prices. Finally, note that households in Beedu village pay the highest prices of the three villages. Beedu is also the most remote of the villages with no large town nearby, suggesting that search costs do matter in determining the price level.

In summary, the regressions in Table 5 show us that prices are income dependent, and open market prices much more so. Quantity premiums seem to matter since families with more land and fewer people pay higher prices because they are likely to purchase smaller quantities in the open market.

CONCLUSION

This paper uses a unique set of data from South India to show that unit prices faced by households are heterogeneous. Moreover, these prices are income-dependent with the poor paying higher prices than the rich. Consequently, inequality measures using real incomes adjusted with household specific price indices display greater inequality than inequality measured with nominal incomes. The main reason why prices are higher for the poor is that liquidity constraints force them to purchase goods in very small quantities and consequently subject them to quantity premiums. This is further indicated by regressions which show that families with more land, and of smaller size, also face higher prices because they too are likely to purchase food in smaller quantities. Pulses and legumes, which are the primary source of protein for most households, are the goods most affected by such quantity discounts because they are widely consumed but expensive, and thus more likely to be purchased in small amounts. The qualitative work

[13]This may suggest that families with access to lower prices may become larger by attracting relatives or by having higher fertility. However, given the Indian context where family size and structure are determined by very powerful incentives derived from son-preference and marriage and kinship systems, this is an unlikely scenario.

shows that the public distribution system is ineffective in combating the problem, because it is inefficient, corrupt, and limited in scope.[14]

Case-studies such as this are subject to both the advantages of detailed data and the disadvantages of a small data set. Future work will have to determine if these findings can be generalized to larger populations. If such effects are widespread, measures of poverty that take complex price-income dependencies into account would have to be developed and implemented with careful surveys of large samples. This paper also indicates that future work on demand systems will have to be concerned about the possibility that prices and quantities may be endogenously determined.[15]

REFERENCES

Alcaly, R. E., Information and Food Prices, *Bell Journal of Economics*, Vol. 7, pp. 658–71, Autumn 1976.

Anglin, P. M. and M. R. Baye, Information Gathering and Cost of Living Differences Among Searchers, *Economics Letters*, 28, 247–50, 1988.

Kunreuther, H., Why the Poor May Pay More for Food: Theoretical and Empirical Evidence, *Journal of Business*, 46 (3), 368–83, July 1973.

Macdonald, J. M. and P. E. Nelson, Do the Poor Still Pay More? Food Price Variations in Large Metropolitan Areas, *Journal of Urban Economics*, 30, 344–59, 1991.

Musgrove, P. and O. Galindo, Do the Poor Pay More? Retail Food Prices in Northeast Brazil, *Economic Development and Cultural Change*, 37(1), 91–109 October 1988.

Pal, S.P. and D.K. Pant, An Alternative Human Development Index, *Margin*, 25(2–II), 8–22, January–March 1993.

Van Praag, B. M. S. and M. R. Baye, The Poverty Concept When Prices are Income-Dependent, *Journal of Econometrics* 43, 153–66, 1990.

---

[14]Consumption loans at lower interest rates would help alleviate this problem. To illustrate the point, consider the case of yellow split peas where the price premium is 25 percent. Assuming zero inflation, storage and transactions costs, a small loan for the cost of a kilogram of yellow split peas spread over 10 weeks at an interest rate of less than 25 percent should be preferable to making a weekly 100 gram purchase and paying the premium.

[15]The fieldwork conducted for this paper suggests that community-specific data on the degree of competitiveness of local retail markets could be helpful in identifying price variation independent of the quantities purchased.