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Abstract

Shifting focus from income to capability deprivation signifies an important milestone toward accurately measuring poverty. I operationalize capability deprivation in the United States and compare poverty measurement outcomes among various capability approaches and between capability and income spaces. Of the three capability approaches examined, the factor score absolute approach suggests a greater extent of poverty and more comprehensive demographic profiles of the poor. Additionally, I find that using the capability space may further attenuate the extent of poverty over those using the income space and alter somewhat the stereotypical profiles of the poor.

Keywords: Capability; Income; Poverty; Demographic profile; General Social Survey; United States

I. Introduction

Initially expounded by Amartya Sen (1983, 1985a, 1987a, 1987b, 1987c, 1992, 1999, 2006), the capability approach regards capability as the central focus in human development. Rejecting the long-held thesis that income or gross domestic product can effectively indicate the state of human development, proponents of this approach claim it is the human capability that needs to be used to monitor developmental progresses (Deneulin 2006; Nussbaum 2006; Nussbaum and Sen 1993; Sen 1999). Because people have different values, interests, preferences, and needs, the ability to expand human capabilities constitutes a more uniformly acceptable and comparable form of progress (Sen 1992, 1999). No matter how much financial, social, cultural, or technological accomplishments are made, societies cannot be better off without expanding people's fundamental capabilities.

Capability, in this sense, is defined as the ability to achieve 'functionings' or the things that societies or individuals value and have reasons to value. Functionings or achievements are the

‘beings or doings’ or the ends in human lives, with the capability indicating the freedom or choice that one has to make these functionings happen (Sen 1987c, 1992, 1999). Just like the choices among different products or services given the budget constraints in consumer choice theory, a combination of functionings is available for people or society to choose from depending on their values, preferences, interests, and needs.

At a general level, functionings conceived as the outcomes have constitutive values where as the capabilities taken as the means have instrumental values to make such functionings happen. The level of education possessed, for example, provides the freedom to do the things that one wants to do including earning an income needed to maintain a desired lifestyle. Income or the type of life maintained with it constitutes the outcome or functioning with education having an instrumental role in achieving it. To complicate, however, capabilities such as education typically have intrinsic values given the importance that society places on them and/or the roles that being an informed person can play in determining the human or social well-being.

This substantively rich but still abstract concept of capability has rendered the traditional poverty definitions focusing on income or consumption increasingly less useful, gradually replacing them with the capability approach or some form of a multidimensional framework incorporating capability.¹ The operational modalities of capability measurement, however, are still underdeveloped, causing an underutilization of this approach in measuring and analyzing poverty. Nowhere has this concept been more underutilized than in the United States despite enormous data potential to carryout empirical analyses. This paper provides a framework to

¹ Some of these approaches attempt to capture multiple dimensions of poverty in an integrated framework. Wagle’s (2002, 2005, Forthcoming) treatment, for example, incorporates capability, the topic of interest here, as one of the different dimensions of poverty together with economic well-being and social inclusion. ‘Relative deprivation’ is another concept that has been applied to capture the individual frustration or unsatisfying emotional experience using economic as well as non-economic indicators (Coleman 1990; Rankin and Quane 2000; Stewart 2006; Walker and Smith 2002).

measure capability deprivation and applies it to measure poverty in the US. Using data from the General Social Survey (GSS), I compare the measurement outcomes of capability deprivation and poverty between 1994 and 2004, between the three operational approaches used to measure capability, and between the capability and income spaces. Findings suggest that the magnitude of capability poverty partly depends on the specific framework applied but yet may be lower than that of income poverty. The demographic profiles of the poor are also somewhat different between the capability and income spaces. Next section specifies the operational framework to measure capability. Section three discusses the difficulties in coming up with specific indicators to measure capability with their implications for the measurement outcomes. The following section develops questions and describes the data. Sections five and six present measurement outcomes and examine demographic profiles of the poor following different approaches in the capability and income spaces. Last section concludes with a discussion of important findings.

II. Measuring Capability Deprivation and Poverty

The capability space is a multidimensional space against which one's position on deprivation and poverty can be projected and evaluated. Because capability indicates the degree of freedom enjoyed with an ability to lead the type of life one values and has reasons to value, at the core of this multidimensional space is the actual freedom that he or she enjoys. Functionings, freedom, and choices are highly interrelated theoretical concepts with 'idealistic' flavor and are difficult to measure because of their abstract nature. Capability in turn profoundly influences their realization and, albeit still abstract in character, is operationally more palatable because of its focus on what one has rather than on what one could do or be.

Capability deprivation of an individual, P , can to be assessed in a multidimensional space

using her or his performance or score on multiple indicators:²

$$P = f(D_1, D_2, \dots, D_j) \dots \dots \dots (1)$$

Where D_1, D_2, \dots, D_j are the various indicators of capability. Since all of the indicators used in determining P may not be weighed equally, the following framework helps aggregate individual scores into the overall deprivation score:

$$P = \sum_{j=1}^J W_{dj} \cdot D_j \dots \dots \dots (2)$$

Where W_{dj} is the weight used to aggregate various indicators. While W_{dj} can be determined either empirically or by using some value judgments,³ this is precisely one of the major sticking points where specific methods used can lead to diverging measurement outcomes.⁴ More difficult, however, is to determine the actual poverty or deprivation status of individuals. The issue of using appropriate poverty line or threshold becomes equally important, just like in the income space. This issue can be even more controversial since, unlike in the traditionally used poverty lines, using a multidimensional space makes the estimates intuitively less conspicuous and thus more difficult to defend.

Further controversies arise due to the notions of absolute versus relative deprivation.⁵ While the debate on this continues as the needs and deprivation can vary across society, group, or individuals depending on time, space, climate, culture, and other characteristics, Sen argued,

² As a multidimensional construct, capability deprivation would have to be jointly determined by one's status on its various dimensions. These dimensions can also be complex and unobservable, which can be measured by using multiple indicators of their own. In this paper, however, I use 'dimensions' and 'indicators' interchangeably.

³ As will be clear shortly, one of the alternatives is to measure the poverty status directly without ascertaining the cardinal deprivation scores. In this case, the issue of aggregation can be avoided altogether. The issue of weighting indicators still needs to be dealt with, however, as some indicators may be less important than others.

⁴ Incorporating value judgments, for example, the UNDP (2006) uses equal weights in aggregating various macro indicators to determine the Human Poverty Index where as Wagle (2005, Forthcoming) uses an empirical procedure (factor analysis) to aggregate various micro indicators of capability.

⁵ The fight between Sen (1985b) and Townsend (1985) is quintessential of the tension between using absolute and relative criteria, with the former arguing for the absolute and the latter for the relative criteria.

[A]n absolute approach in the space of capabilities translates into a relative approach in the space of commodities, resources, and incomes in dealing with some important capabilities, such as avoiding shame from failure to meet social conventions, participating in social activities, and retaining self-respect (Sen 1983: 167-68).

More specific to the capability approach is the message that there is some ‘absolutist core’ in the capability deprivation so that the perceived contextual differences in the commodity space do not apply to the capability space. It makes sense to argue that one with capabilities below certain minimum is deprived of the freedom to achieve basic and valuable functionings irrespective of the societies in which he or she lives. At the same time, Qizilbash (2002) and Qizilbash and Clark (2005) argue that one’s relative position may be important even when capability deprivation is considered since its measurement has to rely on some observable indicators that tend to vary between societies and over time.⁶ For this precise reason, the UNDP (2006) uses separate thresholds of longevity for developing and advanced countries, with 40 years for the former and 60 years for the latter. This indicates that there is nothing cut-and-dried in terms of using absolute or relative criterion to identify one’s status on capability poverty.

Despite these tensions, many have attempted to measure capability deprivation and poverty using different approaches. One of such approaches is to use factor analysis or some indexing methodologies, determining the capability deprivation scores as mentioned above and then ascertaining the poverty status applying some absolute or relative thresholds. Lelli (2001), Klasen (2000), and Wagle (2005, Forthcoming), for example, compute capability deprivation scores and identify as the capability poor those falling on the bottom 10, 20, 30, or 40 percent. Another approach is to use fuzzy set theoretic methodologies and apply some judgmental criteria to delineate the poor on each of the different indicators of capability. Here too, a possibility

⁶ The degree of knowledge, for example, changes consistent with or even beyond what its formal indicators, such as educational attainment, can capture. Educational attainment has significantly changed in the past few decades in the US, making college education, once considered beyond a norm, more typical today. Any capability poverty threshold focusing on educational attainment would have to be relative to the given time and society.

exists of using absolute or relative criteria to identify the poor with poverty status typically identified without computing factor scores or indices. Qizilbash and Clark (2005), for example, use this approach by treating some specific rank orders to identify the poor.⁷

In this analysis, I focus on the fuzzy set and factor analytical approaches. First, the fuzzy set approach is essentially fuzzy, acknowledging right from the beginning the notion that capability is an abstract concept that cannot be captured neatly using some standard econometric methodologies (Qizilbash 2003). Despite being less epistemic, it is appropriate to accurately assess the vaguely defined capability deprivation with important implications for the identification of the poor. Different from the traditional, dichotomous notions of poverty, however, this approach has been used to identify the *definitely poor*, *definitely non-poor*, and those in between (Berenger and Verdier-Chouchane 2007; Lelli 2001; Qizilbash 2003; Qizilbash and Clark 2005). In the set theoretic expression, an individual would have the membership to the *definitely poor* if he or she is below the threshold D_j^* on all of the indicators used and to the *definitely non-poor* if he or she is above the threshold D_j^{**} on all of the indicators used.

$$S = 1, \text{ if } D_j < D_j^* \quad \forall D_j (j = 1, 2, 3, \dots, J) \quad \dots \quad (3)$$

$$S = 0, \text{ if } D_j > D_j^{**} \quad \forall D_j (j = 1, 2, 3, \dots, J) \quad \dots \quad (4)$$

In case of not having membership to any of these groups, the degree of i 's membership to the *poor* would depend on the weighted average of the membership scores on each of the indicators.

$$0 < S < 1, \text{ if } D_j < D_j^* \text{ and } D_j > D_j^{**} \text{ for at least one } D_j.^8 \dots \quad (5)$$

⁷ They also apply the subjective criteria of poverty as indicated by their survey and find that the measurement outcomes may be rather different between different approaches.

⁸ In this case, the degree of membership would have to be computed as $\frac{(D_j^{**} - D_j)}{(D_j^{**} - D_j^*)}$ for each indicator, with the weighted average of all indicators determining the degree of membership to the capability poor.

I will follow this operational framework in identifying the capability poverty status. Since the real world applications require outcomes with poor/non-poor categorization rather than with above categorizations identifying some as ‘little bit’ poor or close to being poor,⁹ I use the dichotomous measurement outcomes, replacing expressions (3), (4), and (5) with:

$$S = 1, \text{ if } D_j < D_j^* \quad \forall D_j \quad \dots \quad \dots \quad \dots \quad (6)$$

$$S = 0, \text{ if } D_j > D_j^* \text{ for at least one } D_j \quad \dots \quad \dots \quad (7)$$

Where only one operational threshold applies to each indicator. This approach may attenuate the magnitude of poverty, however, since it is only the membership to poverty on all relevant indicators that qualifies one to be the capability poor.

Second, the factor analytical approach regards capability deprivation as a latent, multi-indicator construct, to be determined by aggregating the various indicators into the final deprivation index. Rather than using specific value judgments for the weights of indicators, however, the factor analytical procedure will empirically determine the weights or coefficients in the form of loadings in order to compute the factor scores. Consistent with Lelli (2001) and Wagle (2005, Forthcoming), I use the following expression:

$$D_j = A_j P + \varepsilon \quad \dots \quad \dots \quad \dots \quad \dots \quad (8)$$

where, A_j is the loading on the D_j to estimate the P common factor. In essence, this expression determines the unobservable, common factor, P , as indicated by the observable D_j indicators, all the while eliminating indicators that do not exhibit significant commonality.¹⁰

This procedure yields factor scores as the estimates of capability deprivation, which can be

⁹ Depending on one’s motivation, measurement with more elaborate degrees of poverty can be useful in some situations. In the policymaking world, however, one typically needs to be categorized either as poor or as non-poor, as being poor would qualify the person for some policy supports.

¹⁰ This is to note that I include only one common factor or dimension in the expression with the expectation that capability will turn out to be the only factor to significantly load on the indicators. In actuality, however, this can be thought of as a matrix of common factors as determined by the indicators used.

used to measure inequality or poverty. I will then use the absolute or relative criteria mentioned earlier to determine the capability poverty status. Here, I will use both absolute and relative criteria to evaluate these factor scores, with the absolute criterion following expressions (6) and (7) above and the relative criterion following 60 percent of the median capability deprivation score. More specifically, I use the former criterion so that the highest deprivation score assigned for the cases with the criterion specified in (6) would serve as the reference score suggesting that all those with scores below such reference score would be classified as the poor. Albeit similar to the fuzzy set approach, the factor analytical procedure employs empirically assigned weights so that anyone meeting criterion (7) and yet with the capability deprivation score smaller than the reference score, who would otherwise be classified as non-poor, would be considered poor.¹¹

In case of the relative criterion, distribution of the capability deprivation scores would be used to determine the extent of capability poverty with the 60 percent of the median score serving as the threshold. While this form of relative threshold is widely used in the income, consumption, or commodity space, this will be used as an alternative to the absolute approach. Care is needed in analyzing the measurement outcomes, however, since the 60 percent cutoff may not be highly appropriate in the context of capability deprivation. Even more importantly, since the capability deprivation scores determined through the factor analytical procedure do not include measurement errors, thus causing a loss of potentially relevant information, using the absolute distance between two different scores may not be highly justifiable (Wagle 2005, Forthcoming).

III. Indicators of Capability

One of the major difficulties under the capability approach has been to identify appropriate indicators for immediate application. Sen (1987c, 1992, 1993, 1999) often uses the term ‘basic

¹¹ This partly reflects the actual degree of capability deprivation since one with the overall deprivation score below the reference score would be regarded as poor even if he or she scores much better on one of the indicators.

capabilities' to exemplify some of the central elements of an ideal capability set. Rather than being specific, however, Sen (1993) argues that there needs to be a reasoned debate on developing a specific set of indicators, enduring essentially the tests of time and practical valuation. This deliberate holding out of the potential guide by the living architect has disappointed many who like to see operationalization of the approach in a specifically prescribed manner (Clark 2005; Deneulin 2006; Gasper 1997, 2002; Nussbaum 2000). This has even led some to propose a list of 'central human capabilities' including, inter alia, physical, inner, and political qualities of life (Nussbaum 2000, 2006).

Sen (1983, 1987b, 1992, 1993) believes that deprivation is absolute in the capability space. But it is the possible changes in the way capabilities can manifest themselves that make providing a rigid list of capability indicators difficult as well as unreasonable. Capability manifests both instrumental and intrinsic values, making the distinction between itself and functionings blurry. While this further complicates the measurement of capability deprivation, the focus needs to be on measuring capability as a resource to achieve the functionings, with quality of life as the final outcome.

There have been many attempts to operationalize the capability approach to measure poverty and quality of life (Alkire 2002; Berenger and Verdier-Chouchane 2007; Lelli 2001; Nolan and Whelan 1996; Ringen 1995; Wagle 2005, Forthcoming). A more influential operationalization, however, comes from the UNDP (1996, 2006) focusing on the fundamental aspects of capability to monitor the progress on human development. The initial capability poverty measure focused on health and educational indicators (UNDP 1996). But the more regularly published human development indices also incorporate income and unemployment measures (UNDP 2006).

Despite all-encompassing theoretical discussions, knowledge, health, and self-respect have

been depicted as the most fundamental indicators of capability for their both constitutive and instrumental values (Muellbauer 1987; Sen 1987c, 1992, 1993, 1999). Income, commodities, and other indicators of living standard sometimes used to measure deprivation (Alkire and Foster 2007; Colman 1990; Iceland and Bauman 2004; Rankin and Quane 2000) are less relevant to measure capability since they are confined mostly to their constitutive values. Quality of life or functioning depends on many factors including capability and other contextual and demographic profiles by which preferences and needs tend to change across individuals (Sen 1987a). That commodities such as accommodation, food, clothing, and amenities are not relevant to measuring capability from the functionings perspective is also empirically substantiated (Lelli 2001). No doubt, more systematic measurement and analysis of capability deprivation would require using a comprehensive list of indicators encompassing one's inner strength as well as relationships to society as in the case of systematic discrimination or social exclusion (Sen 2000). The outcomes of this analysis need to be taken in light of these conceptual shortcomings. But the indicators relating to knowledge, health, and self-respect provide a compelling basis for methodological advancement in the measurement of capability.

IV. Questions and Data

The US economy has undergone enormous economic changes in the past decade alone with quite variable rates of economic growth. Even more important have been the changes in the labor market with a tumultuous environment for employment, especially in the manufacturing, service, and technology sectors. No doubt, economic changes determine the fate of all participating in the economy. But they also bring about important implications for the way society is organized and the way different players determine their fate. Impact of the economic changes on the preference over education and technology is one example that occurs through changing labor market

dynamics. Not all the changes in the social organization are produced by the changes in the economy, however; neither can the changes happen so rapidly.

I apply the methodological framework discussed earlier to understand how, if any, capability deprivation and poverty have changed between the 1990s and 2000s in the US and how their trend compares with the trend in the income space. This is also to investigate how, if any, focusing on capability deprivation alters the stereotypical profiles of the poor. Because the capability and income provide different spaces, I expect poverty measurement outcomes and demographic profiles of the poor to be somewhat different. By way of investigating these substantive issues, I also seek to gain methodological lessons for the application of the capability approach to measure poverty.

Data for this analysis come from the GSS conducted by the National Opinion Research Center. The GSS provides a comprehensive database to investigate important economic, political, social, and other issues in the US. These data, regularly collected from a large, nationally representative sample of respondents, have been useful to examine cross-sectional or temporal trends in society. Focusing on the basic capability set including knowledge, health, and self-respect, I use the educational attainment, degree, condition of health, and occupational prestige variables available in the 1994 and 2004 waves of the GSS¹² (Table A1 in the Appendix provides information on these variables).

The educational attainment and degree variables capture the knowledge necessary to be a well-informed citizen with an ability to make appropriate decisions. These indicators are profoundly important to measure a concept that has both instrumental and constitutive values in determining

¹² I expect data from these years to approximate the economic trend for the 1990s and 2000s. Admittedly, the economic and labor market changes of the 1990s reached the pinnacle by 1998-1999, with the cycles of the 2000s still in effect. Because these years witnessed the expanding and shrinking modes of the economy, data from these waves capture important changes in the economic and non-economic behavior of households.

the quality of life. It is important to acknowledge, however, that these two variables are only imperfect indicators of knowledge since they miss any knowledge derived from informal sources such as the media, private conversations, and individual and group efforts. Learning from these informal processes is always difficult to capture quantitatively. Even the attempts to use such potential proxies as newspaper reading and the amount of training received do not produce complete and consistent estimates. There may also be possible redundancies in using both years of schooling and formal educational degree to indicate the degree of knowledge possessed. Years of schooling, however, is not exactly the same as the degree received neither are they measured using the same metric, suggesting that one is complimentary to the other.¹³

Condition of health is used as a measure of one's health status. It elicits information appropriate to gauge the state of one's mental and physical health with both instrumental and constitutive values in life. Only with good health can a person be productive in workplace and elsewhere, making the functionings happen. Yet, the estimates derived give only a rudimentary and subjective assessment of the respondents about their own health. The self-assessed conditions of the respondent's health categorized as excellent, good, fair, and poor may have depended on the level of understanding. Despite these potential measurement issues, health condition is an important aspect of quality of life to be included in the measurement of capability deprivation.

The last indicator used here is the occupational prestige,¹⁴ capturing the self-respect aspect of capability essential to meaningfully function in society. Self-respect deals with how one views her or his own status in the larger community or society with both constitutive and instrumental

¹³ Correlations between them are around 0.86 as reported in Table A2 (in the Appendix).

¹⁴ These occupational prestige scores refer to the 'social standing' of the different occupations as assessed by the respondents. The 1980 occupational prestige scores used here were developed from the GSS data of 1989 using the 1980 Census occupational classifications (NORC 2006).

values. This variable too will be an imperfect indicator of self-respect since prestige and self-respect are not identical neither do these estimates of occupational prestige apply to the overall prestige in the community. Yet, this variable has large predictive validity as one's prestige in the work life can meaningfully predict her or his overall prestige and self-respect.¹⁵

The issue of missing values remains critical as two of the four variables used here have some missing values.¹⁶ In these cases data are imputed using regression of the variable under consideration against the relevant socio-demographic predictors.¹⁷ Since this process presumes 'data missing at random,' potential bias exists especially if there is a non-stochastic component in the missing data. While an alternative to regression imputation to handle missing data would be 'list wise deletion,' this is not a viable option, as it would result in deletion of a substantial portion of the observations.

V. Estimating Capability and Income Poverty

As discussed in section II, I use three different approaches to measure the extent of capability deprivation and poverty in the US. Capability poverty here is conceived as a multi-indicator construct, which can be measured by using the available estimates on educational attainment, degree, health condition, and occupational prestige. To reiterate, the fuzzy set approach suggests identifying poverty status on each of the indicators separately. The aggregate capability poverty status is determined following this approach by the membership to the poor on all four

¹⁵ This is also to note that my attempt to use the 'treated with respect' variable measuring the actual level of respect, which the respondents enjoyed in their work life, was unsuccessful since this question was not included in the 1994 wave of the Survey.

¹⁶ Five percent of the respondents had missing values on prestige where as up to 52 percent (33% in 1994 and 52% in 2004) of the respondents had missing values on health condition.

¹⁷ This is justified since all of the important socio-demographic variables have complete data. The variables used in making such predictions include age, gender, nativity, race, marital status, religion, household size, number of adults, number of children, number of earners, education, income, region, dwelling type, and occupation. While not all variables would turn out to be significant in each case, I use a consistent set of predictors as it would not lead to more or less biased predictions. Because the original set of indicators being imputed contains discrete values, I recode the imputed values to gain consistency.

indicators.¹⁸ The factor analytical approach, on the other hand, estimates the capability deprivation index, which is later used to identify poverty status of individuals using two separate criteria. The absolute criterion entails that the individuals with the capability deprivation scores lower than that of the reference person—who has the highest of all those with membership to the poor on all four indicators—would be considered poor. While this is similar to the totally fuzzy set approach, the absolute criterion includes in the poor those even without membership to the poor on all indicators provided that they meet the condition for the capability deprivation scores. The relative criterion uses the 60 percent of the median capability deprivation score as the threshold to identify poverty status.

Following the factor analytical approach, I estimate expression (8) presented in section II using the 1994 and 2004 data separately. Results from the principal component factor analysis (Table A4) uncover a single common factor in each case.¹⁹ Occupational prestige and especially health condition demonstrate relatively large uniqueness, confirming that they share some commonality

¹⁸ For this purpose, I use a specific threshold on each indicator. I use the high school level of education or 12 years of schooling as the poverty cutoff points for educational indicators where as other cutoff points include ‘fair’ or ‘poor’ response categories in case of health condition and a score of 30 or lower in case of occupational prestige. These may look arbitrary thresholds given the sensitive nature of their usage. At the same time, however, these are highly conservative and intuitively appealing thresholds. The criterion of less than 12 years of schooling or less than high school equivalent education, for example, is fairly accurate to use as poverty cutoff point given the new labor market situations in the US. This is consistent with the Bourguignon and Chakravarty’s (2003) application of the fourth grade of education in rural Brazil and, particularly, with Alkire and Foster’s (2007) application of the high school and equivalent education in the US. The self-evaluated health condition that is short of ‘excellent’ or ‘good’ disallows one to effectively function in the labor market or community and therefore can be considered as a basis for poor quality of life. My operationalization of the health condition is similar to that of Stewart (2006) who looked at health as a unidimensional indicator of deprivation. Establishing a convincing threshold for occupational prestige, however, is problematic since the scores do not have practically sensible values. With the possible range of 17 and 86, the established cutoff of 30 represents the scores associated with select sales workers, private household cooks, industrial machinery repairers, glaziers, food batch-makers, select machine operators, truck drivers, and construction trade helpers. Immediately below these are such occupations as garbage collectors, taxi drivers, mining occupations, carpenter apprentices, ground-keepers and gardeners, and elevator operators. While these occupations may provide large economic payoffs, their prestige levels are relatively low that the occupants are likely to deprive of the self-respect they need to effectively function. From the relative standpoint too, this threshold suggests less than 21 percent as the poor in 1994 and less than 18 percent as the poor in 2004. See Table A3 (in the Appendix) for the poverty measurement outcomes following these thresholds on each indicator.

¹⁹ The second common factor secures a considerably smaller Eigenvalue, an indication of a small commonality to form this factor. See Table A4 for results.

with educational attainment and degree (see Table A2 for correlations). But, as the respective factor loadings indicate, these two indicators also have relatively large weights in aggregating the four indicators of capability deprivation. Results are also consistent with the relatively large weights of the educational indicators, a moderate weight of the prestige indicator, and a small weight of the self-assessed health condition indicator. In the latter case, the loadings carry negative signs consistent with the negative scale of the distribution with lower values signifying better health conditions.

Table 1 reports summary statistics on the predicted capability deprivation scores²⁰ for 1994 and 2004. Starting at zero capturing the condition of those at the bottom of the distribution, these scores have the highest values of over five, with a slightly larger range for 1994. Despite this slightly larger dispersion in 1994, however, the average capability score increased during the period, signifying that most of the scores centered on a higher mean value in 2004.

(Insert Table 1 here)

Table 2 depicts poverty measurement outcomes using various approaches. Applying the absolute criterion on the capability deprivation scores, close to 12 percent were capability poor in 1994, a figure declining to less than eight percent by 2004. Following the relative criterion, on the other hand, slightly less than seven percent would be capability poor in 1994 compared to less than six percent in 2004. Because poverty status following the factor score relative approach depends on the distribution of the capability scores at the bottom half, a more equal distribution as in 2004 would lead to less poverty. Yet, the 2004 figures are very close to those for 1994 perhaps suggesting that the number of those not poor on all of the indicators has tended to

²⁰ These scores may be better termed simply as capability scores since they are measured with ascending scales with higher values indicating higher levels of capability and thus lower levels of capability deprivation. My reference to them as capability deprivation scores has to do with their use, however, where the values of interest are those at the lower end of the distribution.

attenuate over time, despite having considerably lower scores on some indicators.

(Insert Table 2 here)

The fuzzy set approach confers slightly larger than three and two percent as the capability poor in 1994 and 2004 respectively. Since some individuals score considerably lower than the established poverty cutoff points such as high school education or an occupational prestige score of 31, higher poverty figures are plausible following the absolute criterion compared to those following the fuzzy set approach. These respondents, poor on all four indicators, can be thought of as the poorest of the poor or ‘abject poor’ using a comprehensive multidimensional framework (Wagle 2005, Forthcoming). The size of the poor would increase to over 39 percent in 1994 and nearly 33 percent in 2004 if a less stringent criterion such as membership to the poor on any—instead of all—of the indicators were to be applied. While three and two percent would be *definitely poor* in 1994 and 2004 respectively, another 61 and 67 percent would be *definitely non-poor* following the methodology used by Berenger and Verdier-Chouchane (2007), Lelli (2001), Qizilbash (2003), and Qizilbash and Clark (2005). This suggests that about 36 and 31 percent can be either poor or non-poor in 1994 and 2004 depending on the specific criteria used.

(Insert Table 3 here)

The magnitudes of capability poverty are clearly much lower than those in the income space estimated at 12 percent for both years²¹ (Table 2). Particularly lower are the magnitudes provided by the factor score relative and fuzzy set approaches. In case of the factor score absolute approach, while the 12 percent figure for 1994 was very similar to that of income

²¹ These estimates are based on the official poverty thresholds for 1993 and 2003, the years to which data on household income refer. While the before tax incomes reported in the GSS data are not highly precise compared to those from other surveys, such as the Current Population Survey and the Survey of Income and Program Participation, they are helpful to identify the magnitude of poverty on the income space given that the poverty thresholds are specific to different household sizes especially at the lower end of the distribution. These thresholds are adapted from the Census Bureau (2008). Comparatively, these poverty estimates appear to be somewhat lower than the 15 percent official poverty estimates for 1994 but are very similar to the 12 percent estimate for 2004 (Census Bureau 1995, 2005).

poverty, the new figure of over seven percent for 2004 signifies a sizable departure from the income poverty figure. Though plausible, the capability and income poverty magnitudes are not expected to be similar, as the overall spaces used for measurement are different. What is more important, however, is the internal consistency of the methodologies used and any change in the stereotypical conception of the demographic profiles of the poor, which may or may not change between the income and capability spaces.

Apparently, different approaches suggest different sizes of the poverty population. Table 3 further scrutinizes the poor/non-poor categorization across each dyad of the four approaches. Unsurprisingly, while all of the poor using the factor score relative and fuzzy set approaches turn out to be poor using the factor score absolute approach, the converse does not hold. In fact, a relatively large number of the poor following the factor score absolute approach are non-poor following the other two approaches. This is not the case between the factor score relative and fuzzy set approaches, however, as some of the non-poor following one approach are poor following the other. The observation that the poor following the factor score absolute approach include all of the poor following the other two approaches invokes proper explanation. For one, the size of the poor following the former approach is rather large. More importantly, the fuzzy set approach is nested in the factor score absolute approach with the latter being more inclusive. Albeit coincidental, the factor score relative approach happens to be more stringent due perhaps to the relatively concentrated distribution of the capability scores.

As expected, the poor/non-poor categorization appears to be more independent in case of income poverty. Although the size of the income poor is larger, only a small portion of the income poor appear to be capability poor. The converse of this also holds with a small portion of the capability poor categorized as the income poor suggesting that income and capability poverty

share some commonality. What is even more surprising is the fact that this also holds in case of the factor score absolute approach in 1994, which produces very similar poverty figures, corroborating some substantive differences between these two concepts of poverty.

Table 4 reports estimates useful to understand the specific mechanisms by which capability poverty statuses are determined together with their differences with income poverty measurement. The fact that none of the poor following the fuzzy set approach are non-poor following the specific capability indicators is self-explanatory since the poor on each of the four indicators are considered capability poor using this approach. It is interesting to note, however, that this approach leaves out a large segment of the potentially poor population as its stringent definition requires the poor to be poor on all individual indicators. While this large, potentially poor population declined between 1994 and 2004, the size of the capability poor also declined over time.

Between the factor score absolute and factor score relative approaches, moreover, educational attainment and degree turn out to be the major determinants of poverty status none of the capability poor are categorized as non-poor on the individual indicators. Yet, as suggested by the specific criterion used, large segments of the poor following the education and degree indicators appear to be non-poor following the factor score absolute and especially the factor score relative approach. Albeit somewhat less influential, the roles of health and prestige are also important as considerable portions of the poor following these indicators are also poor using the factor score absolute and factor score relative approaches. The size of the poor on health and prestige, which is not identified as poor following these two capability approaches, also declined over time, a result quite consistent with those of the fuzzy set approach.

(Insert Table 4 here)

While there are important differences in the poverty measurement outcomes across different capability approaches, a relatively large mismatch on the poor/non-poor categorization in each case suggests that the indicators used are somewhat different, helping to identify the multidimensionally poor population. It is only the membership to poverty on each capability indicator or the capability deprivation cores smaller than the specific threshold that can separate the multidimensional poor from the rest of the population. Equally important is also the observation that income poverty depicts some commonalities with capability poverty especially using each of the specific indicators. A relatively large income poor population suggests that some of this group would be poor on each of the capability indicators. But this commonality further declined over time as larger percentages of the income poor turned out to be non-poor following the specific indicators. In a similar fashion, a smaller percentage of the income non-poor are categorized as the poor on the specific capability indicators by 2004, further reaffirming that the incidence of income and capability poverty may have grown increasingly divergent in the US.²²

VI. Profiles of the Poor

I estimate Logit models to identify the demographic profiles of the capability and income poor.²³ The dependent variable, poverty status, has three versions resulting from the factor score absolute, factor score relative, and fuzzy set approaches in case of capability poverty and one version specific to income poverty. These models are also specific to 1994 and 2004. In addition

²² This finding is not quite clear from Table 3, partly because the final poverty measurement outcomes are not increasingly different.

²³ As with any Logit model, the purpose is to determine the probability of being poor given the different values of the explanatory variables. The generic version of the model takes the following form:

$$\Pr(Y = 1|X_1, X_2, \dots, X_k) = F(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}}.$$

Where Y is the poverty status and X_1, X_2, \dots, X_k are the various demographic characteristics. Rather than getting to the actual probability, however, the model outputs provide the effect of each variable on changing the log of the odds of being poor, which moves in the same direction as the probability of being poor.

to the changes in poverty profiles over time, these two sets of the models also help identify their sensitivity due to alternative specifications.

Tables 5 and 6 report the model estimates together with relevant fit indices. This is to note that the size of the poor is not very large in case of the fuzzy set and especially factor score relative approaches, with implications for the fit of the model as well as for the potential bias of the estimates. The overall explanatory powers of the models are not very high—a typical scenario in Logit models—neither are they highly variable. More interesting, however, is the observation that the 1994 data predict poverty status more accurately despite using an identical set of explanatory variables. Given comparable pseudo R^2 estimates, income poverty status turns out to be more accurately predicted, a sign that manifests the role of larger poverty population. The weighted averages of the percent poor and non-poor accurately predicted, however, invalidate this notion suggesting that the predictive powers relate more to the specific demographic profiles. Most of the coefficients behave as expected and are largely consistent across all models and years.

(Insert Table 5 here)

Table 5 indicates that the demographic profiles of the poor are somewhat similar as the coefficients on age, race, self-employed, professional and related industry, and Midwest region are consistently significant across the three capability poverty models for 1994. The coefficients on age, Black, professional and related industry, and self-employed are also significant across these models for 2004, although coefficients on Midwest changes to be insignificant (Table 6). Many of these and other profiles appear to be similar across the three capability models and across 1994 and 2004. Results are also partly consistent between the capability and income poverty models with the latter providing significant coefficients on a greater number of variables.

Coefficients on nativity, race, widowed, self-employed, working full time, and employment industries are consistently significant. These similarities and dissimilarities have important implications for the changes in the demographic profiles of the poor across the capability and income spaces.

(Insert Table 6 here)

The model outcomes offer a number of interesting observations. First, some differences exist amidst large similarities in the profiles of the capability poor across different measurement approaches. While the size of the poverty population serves as an important source of these differences, the specific approach followed also makes a difference. Especially interesting are the profiles suggested by the fuzzy set approach which appears to be most restrictive of the three capability approaches due largely to the small poverty population. Between the two factor score approaches, results indicate that older age, Black, other minorities, and widowed increase the likelihood of capability poverty where as nativity, self-employed, working full time, and finance, insurance, real estate, professional and related services, and public administration industries reduce this likelihood. The roles of South, Midwest, Pacific, and retired, though consistent in signs, appear to have changed over time, with South and retired being more significant and Midwest and Pacific less significant by 2004.

Second, the profiles of the capability poor suggested by the models are somewhat in line with those of the income poor. Although there are important changes over time, results largely substantiate the stereotypical profiles of the income poor including female, Black, Hispanic, young, never married, widowed, divorced/separated, large households, multiple children, and locations other than Northeast (Census Bureau 1995, 2005; Dalaker 2005; Denziger and Gottschalk 2005; Iceland 1997, 2003; South, Crowder, and Chavez 2005; Wilson 1996, 2006).

Significant differences exist, however, between the profiles of the capability and income poor especially in terms of age, gender, marital status, region, household size, and number of children. Age, for example, has opposite effects on the likelihood of being poor with older age promoting income poverty and reducing capability poverty. Female headship of households, Mountain region, large households, and large number of children positively affect the probability of being the income poor but have no significant effect on the probability of being the capability poor. Marital status too has inconsistent effects with never married and divorced/separated being more likely to be the income poor and yet not consistently so to be the capability poor.

Third, interesting changes appear to have occurred on the capability poverty profile during the decade examined. A first of such changes is perhaps the effect of time itself with a significant reduction in the poverty incidence following the factor score absolute and fuzzy set approaches.²⁴ The mid and late nineties were the years of technology boom, with surging personal incomes and even lower rates of income poverty—by two percent following the official poverty lines (Census Bureau 1995, 2005). While the overall human development index for the US improved only slightly compared to those of other countries,²⁵ the capability poverty incidence applicable to the specific context appears to have declined consistently. The 2004 data detected some of the new profiles as being systematically related to poverty including the South region, which tended to increase the likelihood of being poor, and the retired, which tended to decrease its likelihood. At the same time, they also eliminated some of the previously identified profiles including widowed and the Midwest and Pacific regions, suggesting the positive role of the former and the negative role of the latter in determining the capability poverty status.

²⁴ The pooled versions of the model by combining data from 1994 and 2004 suggested a consistent role of the time factor. The results of this estimation are not reported here to save space and are available from the author.

²⁵ Countries with comparable human development indices including Norway, Iceland, Australia, and Ireland made over 0.03 improvement compared to 0.01 of the US (UNDP 1997, 2006).

Changes have also occurred in the profiles of the income poor over time, with age, female, nativity, children, religion, and professional and related services being increasingly less significant and regions being more significant. But income poverty appears to have widened geographically and narrowed by gender, nativity, and the presence of children.

VII. Discussions and Conclusion

The theoretical arguments and developments on the capability approach are highly convincing, making important contributions to poverty measurement and research. No doubt, it is yet to gain wider acceptance, as many countries including the US do not even recognize the relevance of incorporating this approach in their official poverty measurement attempts. But one of its most obvious contributions has been to influence the way poverty is conceptualized and measured internationally as well as in ‘non-official’ attempts. Since it underscores poverty as a multidimensional construct, the measurement outcomes from the application of this approach are more comprehensive, thus providing information useful for policymaking (Sen 1995).

A more significant stumbling block has been not so much on the theoretical arguments and expositions but on the real world applications. Part of the problem with applications has been the more ‘idealist’ and abstract character of the approach making it difficult to meaningfully operationalize with specific indicators. Unlike the traditional poverty measurement approaches focusing on income or commodities, for example, the multi-indicator character of this approach makes it challenging to come up with intuitively appealing measurement procedures and criteria. The concept of capability is comprehensive focusing on both capabilities and functionings and encompassing such politically loaded vocabularies as freedom, choice, opportunities, and values. Further theoretical advancements and explications especially with attempts to incorporate the

‘relational’ aspects of life have made the concept even more operationally challenging.²⁶

Notwithstanding these theoretical developments, however, it is important to keep the concept simple and easily adaptable for wider application.

Nowhere have these difficulties more seriously impaired the efforts to apply this approach than in the US, a country where more innovative approaches to poverty measurement and analysis have not been widely recognized (Blank 2007; Brady 2003; Glennerster 2002). This paper attempted to fill this void by drawing attention to the applicability of this approach in this particular context. Recognizing the centrality of some basic capabilities including knowledge, health, and self-respect in human life, I operationalized this approach using educational attainment, degree, health condition, and occupational prestige as indicators. The factor analytical and fuzzy set approaches suggest that capability deprivation may have slightly improved during 1994 and 2004 in the US,²⁷ compared to somewhat invariable degree of economic deprivation. While Poverty measurement outcomes depend on the specific criteria used, they appear to be largely different between the capability and income spaces with the former employing a multidimensional framework suggesting smaller magnitudes of poverty. These two spaces also suggest somewhat different demographic profiles of the poor. Profiles common to both types of poverty, for example, include age, nativity, race, self-employed,

²⁶ Sen’s (2000, 2006) more recent treatise on the subject has further expanded the purview of the approach from the inner strength and resources to the inner and outer resources including relational qualities of life. Partly, this has occurred in response to a charge that capability approach fails to accommodate the issues of social exclusion, which emanate not from the individual failures but from the failures of the larger society or the state. As Ballet, Dubois, and Mahieu (2007) argue, furthermore, the agency aspect of well-being, which necessitates acting out of responsibility for the well-being of not only oneself but also of others, expands collective capability and freedom. The individual capability is therefore intricately entwined with the collective or relational capability further complicating the issue.

²⁷ It is difficult to fully disentangle the non-demographic factors that may have contributed to these positive changes, as one’s performance on the indicators used to measure capability are developed over time and thus are hard to improve in the short term. But some of the credit may need to go to the booming economy that enabled many to gain education, move up in the career ladder, and maintain good health. The overall direction that the society is taking with wider recognition of the role of education in the labor market as well as elsewhere may have also played a positive role.

working full time, and occupations, although the role of age appears to be opposite. Differences occur especially in terms of gender, marital status, region, household size, number of children, and retired, with their less influential roles in determining capability poverty.

The differences in the measurement outcomes and demographic profiles are not particularly surprising, however, as the spaces on which these results are based are rather different. Using the capability space is more convincing and has evolved as a result of the failure of the income or commodity space to accurately capture the true resourcefulness and measure poverty. What is more important is to look at the differences in poverty measurement outcomes and poverty profiles across different capability approaches. Of the three capability approaches used, the two factor score approaches—relative and especially absolute—yield larger poverty estimates where as the fuzzy set approach tends to attenuate poverty estimates. The three approaches also differ in the demographic profiles of the capability poor perhaps above and beyond what the different sizes of the poor may suggest. Yet, the absolute approach, labeling a larger group of the respondents as the capability poor, appears to more accurately predict poverty status. While there is nothing prohibiting the use of relative criteria to identify poverty status using capability scores as the basis, since capability deprivation operates in a specific context, time, and culture, the absolute criterion tends to meet the set theoretic as well as minimum score requirements in identifying the poor. The fuzzy set approach meets only the former requirement, which explains why this approach may produce excessively restrictive measurement outcomes.

Future research needs to further build on this framework to operationalize the capability approach. Since the magnitude of poverty depends on the specific criteria used for the identification of the capability poor in a multidimensional space, more widely agreeable criteria need to be explored and determined together with their implications for the demographic

profiles. It is important to use substantively appropriate indicators of capability, which can be challenging in case of standard survey data like these. This analysis reaffirms the centrality of knowledge, together with important roles of health condition and self respect. But using a wider array of dimensions and indicators would take us closer to accurately measuring capability deprivation and poverty with important implications for the quality of information needed to target policy resources.

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Appendix

Table A1. Summary and Description of the Indicator Variables

(Total number of observations (N) = 2979 in 1994 and 2809 in 2004)

Indicators	Mean	Std. Dev.	Min	Max	Description
Education	13.42	2.945	0	20	Educational attainment of the respondent measured as the highest year of school completed
Degree	1.524	1.188	0	4	Highest educational degree earned by the respondent (Coding: 1=Less than high school, 2=High school, 3=Junior college, 4=Bachelor, and 5=Graduate)
Health*	1.971	0.650	1	4	Respondent's assessment of her or his own condition of health (Coding: 4=Poor, 3=Fair, 2=Good, and 1=Excellent)
Prestige*	43.752	13.743	17	86	Prestige score of the respondent's occupation as developed from the 1980 General Social Survey data

* Missing data were imputed using the relevant socio-demographic variables

Table A2. Correlation Matrix

Indicators	1994			2004		
	Education	Degree	Health	Education	Degree	Health
Degree	0.868			0.859		
Health	-0.319	-0.249		-0.330	-0.278	
Prestige	0.545	0.566	-0.195	0.557	0.580	-0.195

Table A3. Poverty Estimates Following Each Indicator (Values are percentages of the total population)

Indicator	1994 (N=2979)	2004 (N=2809)
Education	18.53	14.1
Degree	16.92	12.89
Health	16.59	12.25
Prestige	20.58	17.34

Table A4. Factor Analysis Output

Factor	Factors				Factor Loadings			
	Eigenvalue	Difference	Proportion	Cumulative	Indicator	Factor 1	Factor 2	Uniqueness
1994 (N = 2979)								
Factor 1	2.105	2.079	1.066	1.066	Education	0.909	-0.020	0.174
Factor 2	0.026	0.060	0.013	1.079	Degree	0.904	0.063	0.180
Factor 3	-0.034	0.089	-0.017	1.062	Health	-0.316	0.147	0.878
Factor 4	-0.122	.	-0.062	1.000	Prestige	0.603	0.014	0.637
2004 (N = 2809)								
Factor 1	2.114	2.099	1.077	1.077	Education	0.901	-0.021	0.188
Factor 2	0.015	0.060	0.008	1.084	Degree	0.900	0.033	0.189
Factor 3	-0.045	0.075	-0.023	1.061	Health	-0.333	0.108	0.877
Factor 4	-0.120	.	-0.061	1.000	Prestige	0.618	0.041	0.617

Tables

Table 1. Summary Statistics on Capability Scores

Variable	Obs	Mean	SD	CV	Gini	Min	Max
Capability Score, 1994	2979	2.950	0.942	0.319	0.175	0.000	5.339
Capability Score, 2004	2809	3.011	0.938	0.312	0.173	0.000	5.237

Note : SD: Standard Deviation; CV: Coefficient Variation; Gini: Gini Coefficient

Table 2. Extent of Poverty (Values as percentage of the total populaiton)

Approach	1994 (N = 2979)	2004 (N = 2809)
Factor Score Absolute	11.95	7.48
Factor Score Relative	6.92	5.55
Fuzzy Set	3.09	2.03
Income	11.98	12.14

Table 3. Similarities in the Poverty Measurement Outcomes (Values as number of cases)

Approach	Category	1994 (N = 2979)						2004 (N = 2809)					
		Factor Score-- Absolute		Factor Score-- Relative		Fuzzy Set		Factor Score-- Absolute		Factor Score-- Relative		Fuzzy Set	
		Non- Poor	Poor	Non- Poor	Poor	Non- Poor	Poor	Non- Poor	Poor	Non- Poor	Poor	Non- Poor	Poor
Factor Score --Relative	Non-Poor	2,623	150					2,599	54				
	Poor	0	206					0	156				
Fuzzy Set	Non-Poor	2,623	264	2,755	132			2,599	153	2,642	110		
	Poor	0	92	18	74			0	57	11	46		
Income	Non-Poor	2376	246	2483	139	2570	52	2325	143	2364	104	2435	33
	Poor	247	110	290	67	317	40	274	67	289	52	317	24

Table 4. Similarities in Poverty Measurement Outcomes Between Approaches and Indicators (Values as number of cases)

Capability Indicators	Category	Factor Score Absolute		Factor Score Relative		Fuzzy Set		Income	
		Non-Poor	Poor	Non-Poor	Poor	Non-Poor	Poor	Non-Poor	Poor
1994 (n = 2979)									
Education	Non-Poor	2,427	0	2,427	0	2,427	0	2,232	195
	Poor	196	356	346	206	460	92	390	162
Degree	Non-Poor	2,475	0	2,475	0	2,475	0	2,264	211
	Poor	148	356	298	206	412	92	358	146
Health	Non-Poor	2,303	182	2,406	79	2,485	0	2,238	247
	Poor	320	174	367	127	402	92	384	110
Prestige	Non-Poor	2,173	184	2,260	97	2,357	0	2,168	189
	Poor	450	172	513	109	530	92	454	168
2004 (n = 2809)									
Education	Non-Poor	2,413	0	2,413	0	2,413	0	2,194	219
	Poor	186	210	240	156	339	57	274	122
Degree	Non-Poor	2,447	0	2,447	0	2,447	0	2,218	229
	Poor	152	210	206	156	305	57	250	112
Health	Non-Poor	2,358	107	2,393	72	2,465	0	2,204	261
	Poor	241	103	260	84	287	57	264	80
Prestige	Non-Poor	2,215	105	2,247	73	2,320	0	2,096	224
	Poor	384	105	406	83	432	57	372	117

Table 5. Logistic Regression of Poverty Status, 1994 (Values in parentheses are standard errors)

Variables	Factor Score		Fuzzy Set	Income
	Absolute	Relative		
Age	0.0438 ** (0.0059)	0.0635 ** (0.0081)	0.0550 ** (0.0109)	-0.0118 * (0.0060)
Female	-0.0964 (0.1507)	-0.2638 (0.2008)	0.2800 (0.2935)	0.3840 * (0.1564)
US-Born	-0.8793 ** (0.2146)	-1.1179 ** (0.2640)	-0.0495 (0.4183)	-0.5963 * (0.2333)
Race:				
Black	0.4531 * (0.1783)	0.7470 ** (0.2259)	1.3070 ** (0.2938)	0.6968 ** (0.1722)
Other (Non-White)	0.6772 * (0.3353)	1.3710 ** (0.4177)	1.5980 * (0.6890)	0.8107 * (0.3252)
Religion:				
Catholic	-0.1091 (0.1646)	0.0230 (0.2117)	0.0392 (0.3026)	-0.3460 * (0.1736)
Other Religions (Except Protestant)	-0.6000 (0.3496)	-1.0354 (0.5499)	0.0000 (0.0000)	-0.5209 (0.3154)
No Religion	0.2796 (0.2476)	-0.0158 (0.3714)	0.2239 (0.5220)	0.2148 (0.2193)
Marital Status:				
Never Married	0.2696 (0.2193)	0.3516 (0.3106)	0.4792 (0.4096)	1.6541 ** (0.2048)
Widowed	0.4104 * (0.2014)	0.4929 * (0.2437)	-0.0608 (0.3461)	0.9291 ** (0.2502)
Divorced/Separated	0.4500 * (0.1844)	0.4802 (0.2508)	0.5390 (0.3399)	1.9394 ** (0.1884)
Region:				
South	0.2717 (0.1740)	0.3855 (0.2255)	0.1277 (0.3125)	0.2313 (0.1952)
Midwest	-0.6037 ** (0.2066)	-0.5883 ** (0.2710)	-0.9509 * (0.3937)	0.2605 (0.2079)
Mountain	-0.6317 (0.3322)	-0.4127 (0.4370)	-0.2611 (0.5935)	0.0020 (0.3054)
Pacific	-0.8329 ** (0.2609)	-1.0471 ** (0.3776)	-1.1372 (0.5936)	-0.2943 (0.2571)
Household Size	0.0424 (0.0661)	-0.0631 (0.0987)	-0.0286 (0.1324)	0.0235 (0.0607)
Number of Children under Six	0.1799 (0.1494)	0.1416 (0.2561)	0.4861 (0.2651)	0.5102 ** (0.1285)
Work Status:				
Self-employed	-0.9247 ** (0.1861)	-0.7916 ** (0.2636)	-1.4406 ** (0.4001)	-2.1935 ** (0.1828)
Working Full-Time	-0.6917 ** (0.2578)	-0.8628 * (0.3845)	-0.3986 (0.4552)	-0.4040 * (0.2006)
Working Part-Time	0.3224 (0.2080)	0.3833 (0.2693)	1.2421 * (0.5430)	-0.1398 (0.2225)
Retired	-0.2537 (0.2028)	-0.2994 (0.2397)	0.0050 (0.3214)	-0.1125 (0.2350)
Unemployed	0.0198 (0.3482)	0.2657 (0.4797)	-0.5146 (0.7946)	-0.5397 (0.3061)
Employment Industry:				
Finance, Insurance, and Real Estate	-1.9163 ** (0.5232)	-1.4555 * (0.6099)	-1.7293 (1.0266)	-1.7245 ** (0.5368)
Professional and Related Services	-1.3202 ** (0.2019)	-1.2677 ** (0.2677)	-2.0452 ** (0.4823)	-0.5855 ** (0.1750)
Public Administration	-1.6849 ** (0.4089)	-2.0312 ** (0.6108)	0.0000 (0.0000)	-1.2228 ** (0.4265)
Construction	0.3844 (0.2539)	0.6036 (0.3164)	-1.8258 (1.0374)	0.0242 (0.3089)
Constant [Poverty Status: Poor=1, Non-Poor=0]	-3.4254 ** (0.6792)	-5.1296 ** (0.9251)	-8.3015 ** (1.5042)	-1.1260 (0.6740)
N	2971	2971	2617	2971
Pseudo R ² (%)	20.91	28.06	26.82	25.48
% Poor Correctly Predicted	15.73	4.35	15.53	57.25
% Poor and Non-Poor Correctly Predicted (weighed)	88.32	84.76	93.39	89.02

Note: * P<0.05; ** P<0.01

Table 6. Logistic Regression of Poverty Status, 2004 (Values in parentheses are standard errors)

Variables	Factor Score --Absolute	Factor Score --Relative	Fuzzy Set	Income
Age	0.0413 ** (0.0068)	0.0486 ** (0.0079)	0.0393 ** (0.0127)	-0.0062 (0.0060)
Female	0.0925 (0.1762)	-0.0592 (0.2027)	0.0460 (0.3224)	0.1437 (0.1487)
US-Born	-0.8091 ** (0.2509)	-1.0026 ** (0.2849)	0.0612 (0.6573)	-0.0285 (0.2520)
Race:				
Black	0.6712 ** (0.2192)	0.5500 * (0.2589)	1.2294 ** (0.3634)	0.7349 ** (0.1732)
Other (Non-White)	0.9585 ** (0.2948)	0.7848 * (0.3437)	0.3226 (0.7927)	0.5690 ** (0.2615)
Religion:				
Catholic	0.1377 (0.2065)	0.2579 (0.2320)	0.1179 (0.3961)	-0.0167 (0.1812)
Other Religions (Except Protestant)	0.0843 (0.3052)	0.2415 (0.3405)	-0.0907 (0.6410)	-0.0035 (0.2458)
No Religion	0.5754 * (0.2370)	0.3086 (0.2939)	0.5546 (0.4632)	0.2499 (0.1902)
Marital Status:				
Never Married	0.1944 (0.2534)	0.3633 (0.2965)	0.0520 (0.5305)	1.8417 ** (0.2005)
Widowed	0.5302 * (0.2552)	0.4651 (0.2829)	0.8929 * (0.4195)	1.3570 ** (0.2683)
Diverced/Separated	0.1733 (0.2201)	0.1722 (0.2589)	0.5655 (0.4108)	1.7413 ** (0.1879)
Region:				
South	0.7502 ** (0.2553)	0.9046 ** (0.2999)	0.7507 (0.5194)	0.9841 ** (0.2362)
Midwest	0.5247 (0.2749)	0.5357 (0.3258)	0.7359 (0.5367)	0.8070 ** (0.2518)
Mountain	-0.4791 (0.5193)	0.0191 (0.5415)	0.0000 (0.6974)	1.1292 ** (0.3135)
Pacific	0.0457 (0.3238)	0.0147 (0.3848)	0.0080 (0.6974)	0.6765 * (0.2827)
Household Size	0.0155 (0.0742)	0.0305 (0.0875)	0.0584 (0.1479)	0.2209 ** (0.0548)
Number of Children under Six	-0.1181 (0.2224)	-0.0289 (0.2604)	-0.8218 (0.6662)	0.0834 (0.1389)
Work Status:				
Self-employed	-0.8880 ** (0.2148)	-1.1011 ** (0.2509)	-1.3447 ** (0.4314)	-1.8068 ** (0.1739)
Working Full-Time	-0.8712 ** (0.3123)	-0.9905 ** (0.3662)	-0.8355 (0.5384)	-0.6760 ** (0.2103)
Working Part-Time	0.5353 * (0.2685)	0.4810 (0.3011)	-0.4065 (0.4064)	0.3696 (0.2494)
Retired	-0.5531 * (0.2561)	-0.6145 * (0.2816)	-0.5644 (0.4101)	-0.1102 (0.2448)
Unemployed	-0.4039 (0.4265)	-0.6555 (0.5177)	-0.3620 (0.7990)	-0.3495 (0.2874)
Employment Industry:				
Finance, Insurance, and Real Estate	-2.8176 ** (1.0119)	-2.4413 * (1.0143)	0.0000 (0.0000)	-1.2662 ** (0.4492)
Professional and Related Services	-1.0099 ** (0.2165)	-1.3460 ** (0.2813)	-1.1367 ** (0.4223)	-0.1478 (0.1560)
Public Administration	-3.0741 ** (1.0118)	-2.8108 ** (1.0154)	0.0000 (0.0000)	-1.5517 ** (0.4782)
Construction	0.6202 * (0.2836)	0.5491 (0.3220)	0.0000 (0.0000)	0.1035 (0.2852)
Constant [Poverty Status: Poor=1, Non-Poor=0]	-4.9423 ** (0.7981)	-5.3165 ** (0.9088)	-5.3171 ** (1.4574)	-4.0930 ** (0.7019)
N	2783	2783	2142	2783
Pseudo R ² (%)	16.91	19.12	18.54	22.12
% Poor Correctly Predicted	0.95	0.00	0.39	44.09
% Poor and Non-Poor Correctly Predicted (weighed)	91.46	74.19	93.45	87.33

Note: * P<0.05; ** P<0.01