Is The Wealth Index Better than The Proxy Means Test in Poverty Targeting? A Study in Brebes and East Jakarta

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Abstract. The ranking of household welfare status in targeting recipients of social protection programs is important and needs attention. Appropriate welfare status ranking is one of the keys for making the various types of programs designed by the government right on target. The Proxy Means Test method is popular in Indonesia in the 2015 Integrated Database Updating. Based on another popular statistical approach to ranking welfare status, the Wealth Index method is also known. Global surveys, such as Demographic and Health Surveys, Multiple Indicator Cluster Surveys, and World Food Program Surveys, have always used the Wealth Index to rank household welfare. Using Susenas data from March 2017 to March 2022, this study found that the Proxy Means Test method is better than the Wealth Index method in both Brebes Regency and East Jakarta City. The value of the classification error rate in Brebes Regency and East Jakarta City using the Proxy Means Test method is 13.94 percent and 10.37 percent, respectively. In comparison, the Wealth Index method is 25.12 percent and 14.74 percent. This research emphasizes that the results of the ranking of household welfare status are not only influenced by the method used but also by the socioeconomic conditions and characteristics of households data in the areas targeted by the program.

1. Introduction

One of the government's efforts to reduce poverty is by designing various programs. In its implementation, the government needs an accurate program targeting database so that the programs designed can be right on target for the target program recipients. The program targeting database usually contains information related to basic socioeconomic information at both the household and individual levels. However, the program targeting database usually does not contain information on household income or expenditure variables needed to rank households according to their welfare status. Collecting income data from the field takes work [1]. In developing countries, most people do not provide detailed information about their income, or they possess only a general understanding. They often attempt to conceal their earnings out of a desire to receive assistance or fear of potential exposure to taxes, political consequences, or even robbery [2].

In using the program targeting database, information on the ranking of households according to their welfare status is needed by the government when it wants to provide a program because, in practice, not all households in the program targeting database will receive a program. The government already has certain priorities and criteria for which households can receive programs. One is by looking at the order of their socioeconomic status in the program targeting database. Efforts are underway to approach household socioeconomic status data in the program targeting database through statistical methods to

address the related needs. The statistical method approach carried out to date uses the Proxy Means Test method, commonly referred to as the PMT model [3]. This method calculates the coefficient of each parameter of the PMT model by building a prediction model of household expenditure levels with the concept of regression. We constructed this regression model using household survey data that includes expenditure variables. Later, the coefficient of each parameter of the PMT model will be applied to predict the level of household expenditure in the program targeting database.

This PMT model uses household characteristic variables, such as roof type, wall type, floor type, and others, and individual characteristic variables within the household to predict household per capita expenditure. The PMT model assumes a linear relationship between the characteristics used and the expenditure variables. Therefore, one of the challenges faced when building the PMT model is that the household characteristic variables can interact very complexly. For example, the type of dirt floor may be a characteristic of welfare in one region but may not be so for another region. That is a challenge in PMT models, where linear models can miss the differences in characteristics between regions [4].

Various literature mentions another approach to measuring the socioeconomic status of households, namely by measuring household wealth [2]. Measuring the socioeconomic status of households with a measure of wealth, according to Rutstein and Johnson (2004) [2], has several advantages in that wealth can show socioeconomic status with a more permanent time dimension when compared to income or consumption. Second, this wealth is easier to measure when compared to measuring income or consumption, which requires more questions. This method of measuring household wealth involves compiling a wealth index. The Wealth Index is a commonly used measure of the socioeconomic position of households in low- to middle-income countries [5]. Global surveys, such as Demographic and Health Surveys, Multiple Indicator Cluster Surveys, and World Food Program Surveys, have always used the Wealth Index to rank household welfare [6]. In terms of methods, using the Wealth Index method in the household ranking process, especially in the targeting database, has yet to be widely used in Indonesia. This research will examine how good the Wealth Index method is in predicting household welfare status compared to the existing method, namely the PMT model, and the opportunities for utilizing the Wealth Index method in ranking household welfare status in program targeting databases.

2. Method

2.1. Proxy Means Test

The Proxy Means Test is a method used to estimate income or consumption when precise measurements are unavailable or difficult to obtain [7]. The word "proxy" refers to several variables correlated with income or expenditure so that they can be used to estimate income levels or expenditure levels [8]. According to Sharif (2009) [9], researchers select variables as proxies to estimate income or consumption levels at the household or individual level, provided these variables meet the following criteria: (i) they are easy to observe and measure; (ii) they cannot be manipulated, and (iii) they are politically insensitive.

Grosh and Baker (1995) [7] suggest building a PMT model using the regression method, where household consumption expenditure is the dependent variable, and some variables correlated with both individual and household expenditure are the independent variables. In general, the regression equation used is:

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots + \beta_p x_{pi} + \varepsilon_i \quad (1)$$

In this equation, where y_i represents the logarithm of income or consumption, x_{pi} signifies household or individual characteristics correlated with income or consumption, β_p denotes the least square parameter estimates, and ε_i represents the random error term.

When constructing a ranking of household welfare status using the PMT method, you need data that includes income or expenditure variables and proxy variables used to estimate the level of income or expenditure. In Indonesia, the data related to the expenditure level and the characteristics of households or individuals is from the National Socioeconomic Survey (Susenas). In summary, the Susenas data will

be used as a reference for PMT modeling using regression techniques to produce coefficient estimates of each characteristic of the proxy variables. There are other requirements in selecting variables used as proxies. These are overlapped variables, namely several variables with the same type, characteristics, and type between the Susenas data and the targeting program database for estimating household expenditure levels.

2.2. Wealth Index

The Wealth Index is a composite index that combines indicators of ownership of durable goods, housing characteristics, and access to public services [5]. The Wealth Index is commonly used to rank household welfare into quintile groups in reports and analyses in Demographic and Health Surveys, Multiple Indicator Cluster Surveys, and World Food Program Surveys [6]. Researchers developed this index because these surveys do not collect household income or expenditure information. Instead, researchers aim to determine how household welfare status impacts health levels. The Wealth Index is a good proxy for household socioeconomic status [10]. According to Filmer and Pritchett (2001) [11], the suggested statistical method for constructing the Wealth Index is the Principal Components Analysis (PCA) method.

In general, PCA aims to reduce the dimensionality of a data set consisting of many interrelated variables while maintaining as much variation as possible in the data set. That process involves data transformation into a set of new variables called principal components. These principal components are uncorrelated and organized to prioritize the retention of most of the variation found in the original variables, particularly in the initial components [12].

PCA is used to explain the structure of the variance-covariance matrix of a set of variables through a linear combination of these variables. Suppose there are p variables consisting of n observations. Suppose you create p variables using k principal components (with $k \leq p$), which are linear combinations of the p variables. The K principal components can replace the p number of variables that make up them without losing much information about the overall variable.

The variable exploration stage is crucial in preparing the Wealth Index using PCA analysis. It should be noted that the selection of indicators included in the PCA analysis is an indicator that is not imbalanced. The selected variables also can distinguish relatively "rich" and relatively "poor" households. A rule of thumb is that if a variable/asset is shared by more than 95% or less than 5% of the sample, it should be excluded from the analysis. For example, knowing that 99.2% of households in Uganda do not own a generator will not help the analyst distinguish between richer and poorer households based on ownership of this asset. As such, the variable will be excluded from constructing the index [6].

2.3. Data and Variables

2.3.1. Data. The basic data used to build the model in this study is the National Socioeconomic Survey (Susenas) data. To strengthen the analysis results, we combined Susenas data from several periods. We do this to gather as much information as possible about the characteristics of households in the regency/city area based on the households selected as Susenas samples, enabling modeling at the regencies/cities level. This study combines Susenas data from March 2017 to March 2022 and selected households with only one family.

This study employs a method to generate aggregated data that adheres to the best practice approach established in Basis Data Terpadu (BDT) Report 2015. Variations in the timing of Susenas data collection result in disparities in household expenditure values due to shifts in economic factors and seasonality. These fluctuations impact the monetary worth of individual household expenses, influenced by inflation or deflation. The consequence of this issue is that household expenditure values are not directly comparable across different Susenas periods, introducing bias and complicating the interpretation of household consumption models. This challenge can be addressed by adjusting household consumption using specific deflators. Among these deflators, the poverty line calculated by

BPS in each Susenas period is a valuable tool for standardizing real household expenditures, ensuring consistency across Susenas periods. Employing the concept of time-spatial adjustment, a real value can be established that reflects the comparability of household expenditure across different time periods and regions [3]. To implement the time-spatial adjustment, Central Jakarta City serves as a reference for equalizing household expenditure values, as it secured the top position in the 2022 Booming Cities Index. This ranking considers regions with stable economic growth rates, the well-being and capabilities of their residents, and the social stability within each area [13].

In a mathematical context, the following formula represents the method used for the time-spatial adjustment of each household expenditure value:

$$Exp\ TS_{ikt} = Exp_{ikt} \times \left(\frac{PL_{jakpus2022}}{PL_{kt}}\right) \quad (2)$$

Where:

$ExpTS_{ikt}$	: Time-spatial equalized per capita expenditure in the i-th sample, in the k-th district/city, and in the t-th year
Exp_{ikt}	: Unequaled per capita expenditure in the i-th sample, in the k-th district/city, and in the t-th year
$PL_{jakpus2022}$	: Poverty Line in Central Jakarta City in 2022
PL_{kt}	: Poverty Line of the k-th district/city in t-th year
i	: 1,2,3, ..., n
k	: 1,2,3, ..., 514
t	: 2017, 2018, 2019, 2020, 2021

The locus of this study is one regency and one city, namely Brebes Regency and East Jakarta City. Brebes Regency is one of the regencies in Central Java that is included in the 35 priority regencies for extreme poverty reduction set by the government in 2021; where Brebes Regency has the highest total number of poor households among other priority regencies. Meanwhile, East Jakarta City was chosen to obtain a comparison of characteristics in the model based on urban areas. The table below presents the number of households that constitute the unit of analysis.

Table 1. Number of Households Each Methodology

Methodology	Number of Households
Proxy Means Test	
Brebes Regency	
Training Data	3,493 Households
Testing Data	832 Households
East Jakarta City	
Training Data	4,727 Households
Testing Data	1,099 Households
Wealth Index	
Brebes Regency	832 Households
East Jakarta City	1,099 Households

2.3.2. Variables . This study divides the variables into two groups: one for PMT modeling and another for constructing the Wealth Index. Previous studies generally used household and individual characteristic variables as proxies for income or expenditure. Narayan and Yoshida (2005) [8] applied the PMT method in ranking the welfare status of households in Sri Lanka using variables of residential location, community characteristics, assets owned by the household, characteristics of the household head (gender, age, education, type of employment) and housing characteristics (home ownership status, type of cooking fuel, type of toilet, number of rooms and type of wall). Sharif (2009) [9] used household demographic characteristics, household head characteristics, ownership of easily verifiable assets, housing quality, access to financial facilities, participation in poverty reduction programs, and area of residence as proxy variables in estimating expenditure with the PMT model in Bangladesh. Meanwhile, Kachaka & Luhanga (2020) [14], in their research in Malawi, used demographic variables (dependency

rate and education of the household head), housing characteristics (roof type, floor type, home ownership status, lighting source, and drinking water source), asset ownership and household food security.

When applying the PMT method in this study, we selected variables theoretically correlated with expenditure and variables that previous research had used to form the PMT model. The household per capita expenditure variable is the dependent variable in the PMT model. We transform this variable into the form of log per capita household expenditure. Furthermore, the variables that serve as proxies and independent variables in PMT modeling are household characteristics that are relevant for predicting household expenditure. The household characteristics used not only the characteristics of the household head but also the characteristics of all household members.

We converted all household characteristic variables into dummy variables while aggregating individual characteristics within households based on these characteristics. In addition, based on the initial variables and the initial categories from the Susenas data, regrouping was done using the Tukey method. We use the Tukey method to determine if there are significant differences between categories in variables. The output of the Tukey method will group variables that do not show statistical differences into the same category. For example, the variable of building ownership status, which originally had seven categories, was regrouped into four categories: owned, rent-free/other, rent/contract, and official.

The Tukey test in this study was conducted by comparing the average household per capita expenditure between categories in one variable. The hypothesis in the Tukey test is as follows:

H_0: $\mu A_1 = \mu A_2$

H_1: $\mu A_1 \neq \mu A_2$

Description:

H_0: There is no difference in the average per capita household expenditure on variable A for category 1 and category 2.

H_1: There is a difference in average household per capita expenditure on variable A for category 1 and category 2.

Table 2. Classification of Proxy Variables in the PMT Model

Variable Groups	Variables
Demography	Number of HH members by age groups
	Number of HH members
Education	Percentage of HH members who have completed a certain level of education
Occupation	Jobs sector
	Jobs status
Housing Characteristics	House ownership
	Type of floor
	Type of roof
	Type of wall
	Main source of light
	Main source of water
	Main fuel/energy for cooking
	Toilet ownership
	Type of latrine
	Type of final disposal of feces
Assets Ownership	Jewelry, motorcycle, boat, AC, wheater, fridge, motorboat, car, phone, and computer/laptop

Regarding the variables used in compiling the Wealth Index, Rutstein and Johnson (2004) [10], in DHS Comparative Report No. 6, noted that they utilized all variables related to asset ownership. The DHS program website also specifies that the Wealth Index calculation involves utilizing variables

related to household ownership of assets, materials used for housing, and access to water and sanitation. In this study, we based the variables used in compiling the Wealth Index on references from the DHS program, adjusting them with the data available in the Susenas dataset.

Table 3. Classification Variables in Wealth Index

Variable Groups	Variables
Housing Characteristics	House ownership
	Type of floor
	Type of roof
	Type of wall
	Main source of light
	Main source of water
	Main fuel/energy for cooking
	Toilet ownership
	Type of latrine
	Type of final disposal of feces
Assets Ownership	Jewelry, motorcycle, boat, AC, wheater, fridge, motorboat, car, phone, and computer/laptop

2.4. Comparison Method for The Ranking of PMT and Wealth Index Results

After all the ranking stages have been carried out, a method is needed to compare the ranking results of the PMT and Wealth Index methods. In this study, we propose two methods of comparison approach. The first method is to compare the demographic and socioeconomic characteristics of households, including asset ownership by household quantile group, based on the ranking results of the PMT and Wealth Index results. As a reference for comparison, factual data based on characteristics by quantile group is used due to the ranking of household per capita expenditure data obtained from Susenas. The assumption used is that the results of household characteristics that have a pattern closer to the factual data, then the method is considered better.

Table 4. Illustration of Inclusion error (IE) and Exclusion error (EE)

	Predicted Model: Quintile 1-2	Predicted Model: Quintile 3-5	Total Household
Factual: Quintile 1-2	Matched	*Type 2 error*	M_1
Factual: Quintile 3-5	*Type 1 error*	Matched	M_2
Total Household	N_1	N_2	N

$$Exclusion\ error\ (\text{EE}) = (Type\ 2\ error\ /\ M_1) \times 100 \quad (3)$$

$$Inclusion\ error\ (\text{IE}) = (Type\ 1\ error\ /\ N_1) \times 100 \quad (4)$$

The second method is to compare the proportion of errors in classification (Inclusion Error/Exclusion Error) of the ranking results of the PMT and Wealth Index methods. Inclusion error (IE) is when a household should be in the upper group, but the results in the model are classified as the lower group. Meanwhile, exclusion error (EE) is when a household should be in the lower group, but the model results are classified as the upper group. This study uses the quantile 1-2, or bottom 40%, as the limit in calculating IE/EE as well as Kusumawati and Kudo [15] and Tohari et.al [16]. The smaller the IE/EE value produced by a method, the better the method is in ranking.

In comparing the results of household welfare ranking using the PMT and Wealth Index models, this study has applied the models to the same dataset, which is based on the socioeconomic characteristics of Susenas households in March 2022, to rank welfare according to Quantile groups. Susenas March 2017 - March 2021 data is only used as training data in forming the PMT model, while the data used as

testing data to see the model's performance is the same, namely Susenas March 2022, both PMT and Wealth Index models.

3. Result and Discussion

3.1. Socioeconomic Characteristics of Households in Brebes and East Jakarta

Brebes is one of the regencies in Central Java with a high poverty rate. The percentage of poor people in Brebes Regency in 2022 reached 16.05 percent, while the percentage of the extremely poor was 3.99 percent. This condition also includes Brebes in the regencies prioritized for addressing extreme poverty. Descriptively, based on the March 2022 Susenas data, almost half of the household heads in Brebes work in the agricultural sector and are evenly distributed across all quantile groups. Although the head of the household works, the burden on the household by the quantile group is not the same. Households in the lower quantile groups have a larger average number of household members in the unproductive age group, those aged 0-4 years, and the elderly aged 65 years and above, compared to households in the upper quantile groups. The lack of access to sanitation among households in the lower quantile group exacerbates this condition. Regarding asset ownership, motorcycles, and refrigerators are the most common assets households in Brebes own. There is also a trend that the higher the welfare group, the greater the proportion of households that own these assets.

Table 5. Descriptive Data in Brebes Regency

Variables	Quintile					Average
	Lowest	Second	Middle	Fourth	Highest	
Demographic						
Average number of household members by age group						
0-4	0.35	0.23	0.20	0.13	0.10	0.20
5-19	1.11	0.93	0.94	0.63	0.55	0.83
20-64	1.96	1.98	1.97	1.87	1.86	1.93
65+	0.26	0.24	0.17	0.17	0.13	0.20
Educational attainment of HH Members						
Primary School	29.18	25.58	32.13	31.82	25.48	28.83
Junior High School	15.03	16.10	11.81	11.57	15.85	14.08
Senior High School	7.86	10.83	12.40	14.00	17.12	12.43
Diploma	0.12	0.10	0.42	0.77	3.77	1.03
Bachelor/Master/Doctoral	0.70	0.48	0.39	1.93	8.54	2.40
Number HH members	3.68	3.38	3.28	2.81	2.64	3.16
Socio-economics						
Employment sector of HH head (1 = agricultural; 0 = other)	44.91	47.90	42.77	44.58	31.33	42.31
Employment status of HH head (1 = formal; 0 = other)	18.56	16.77	23.49	19.28	27.11	21.03
Percapita House size (m^2)	22.96	26.69	28.58	36.75	41.95	31.37
Access to electricity	100.00	100.00	100.00	100.00	100.00	100.00
Access to water	71.86	65.87	65.66	54.22	51.20	61.78
Access to sanitation	68.86	81.44	78.92	86.75	84.94	80.17
Asset						
Has Jewelry	3.59	6.59	7.23	14.46	31.33	12.62
Has Motorcycle	65.27	74.85	82.53	79.52	92.77	78.97
Has Boat	0.60	1.20	1.20	0.00	0.00	0.60
Has AC	0.00	0.60	1.20	0.00	12.65	2.88
Has Wheater	0.60	0.00	0.00	1.81	5.42	1.56

Variables	Quintile					Average
	Lowest	Second	Middle	Fourth	Highest	
Has Fridge	28.74	44.31	53.61	60.24	68.07	50.96
Has Motorboat	0.00	0.00	0.60	0.60	0.00	0.24
Has Car	0.00	0.60	0.00	3.01	27.11	6.13
Has Phone	0.00	0.60	0.00	0.00	0.60	0.24
Has Computer	0.60	3.59	3.01	7.83	20.48	7.09
Has > 1 assets of transportation	0.00	1.20	1.81	3.01	27.11	6.61
Has > 1 assets of electronic	0.60	2.40	3.61	7.83	22.89	7.45
Number of Observation	**167**	**167**	**166**	**166**	**166**	

Source: Authors' calculations based on Susenas data

East Jakarta is a city in DKI Jakarta Province, with the percentage of poor people in 2022 reaching 4.30 percent, while the percentage of the extreme poor is 0.61 percent. Unlike Brebes Regency, East Jakarta is an area that generally shows an urban area where only around 1 percent of household heads work in the agricultural sector. In addition, because it is an urban area, most household heads work as formal workers, reaching 45.13 percent. In terms of education of household members, most have a high school education and above, which is higher than in Brebes, where most have a junior high school education and below. Regarding asset ownership, the types of assets owned by households in East Jakarta are more varied when compared to those owned by households in Brebes. Some assets widely owned by households in East Jakarta include motorcycles, refrigerators, air conditioners, and computers. In addition, there are variations in the proportion of household distribution by quintile group on several types of assets, such as air conditioners, where in the quantile 1 group, the proportion of households that own air conditioners is only 10.45 percent. However, in the top quintile group, it reaches 82.19 percent. A similar pattern occurs for other assets such as jewelry, cars, and computers.

Table 6. Descriptive Data in East Jakarta City

Variables	Quintile					Average
	Lowest	Second	Middle	Fourth	Highest	
Demographic						
Average number of household members by age group						
0-4	0.31	0.28	0.21	0.16	0.08	0.21
5-19	1.37	1.01	0.88	0.57	0.37	0.84
20-64	2.33	2.27	2.05	1.96	1.71	2.07
65+	0.08	0.07	0.13	0.27	0.41	0.19
Educational attainment of HH Members						
Primary School	13.58	11.66	11.88	11.35	7.36	11.17
Junior High School	15.91	12.71	11.92	11.21	10.11	12.37
Senior High School	39.58	43.76	41.70	41.88	31.88	39.76
Diploma	1.63	2.48	2.76	7.07	8.22	4.43
Bachelor/Master/Doctoral	1.53	3.11	8.27	14.52	32.64	12.00
Number HH members	4.10	3.63	3.27	2.97	2.57	3.31
Socio-economics						
Employment sector of HH head (1 = agricultural; 0 = other)	0.91	0.45	1.82	0.45	1.83	1.09
Employment status of HH head (1 = formal; 0 = other)	45.91	49.09	49.55	41.36	39.73	45.13
Percapita House size (m^2)	10.23	16.13	20.50	31.20	68.12	29.20
Access to electricity	100.00	99.55	100.00	100.00	100.00	99.91
Access to water	32.27	23.64	26.82	24.55	7.31	22.93
Access to sanitation	91.36	92.27	96.82	94.09	95.43	93.99
Asset						
Has jewelry	7.27	13.64	27.27	40.91	67.58	31.30
Has Motorcycle	75.91	82.27	80.00	78.64	65.30	76.43
Has Boat	0.00	0.91	1.36	0.91	0.46	0.73
Has AC	10.45	21.36	38.64	52.27	82.19	40.95
Has Wheater	0.45	1.36	1.82	2.73	24.66	6.19
Has Fridge	80.45	92.27	93.18	92.73	96.35	90.99
Has Motorboat	0.45	0.00	0.00	0.45	0.46	0.27

Variables	Quintile					Average
	Lowest	Second	Middle	Fourth	Highest	
Has Car	1.82	6.82	15.45	30.00	56.16	22.02
Has Phone	2.27	0.91	2.27	7.73	23.29	7.28
Has Computer	13.64	26.36	38.64	50.00	66.21	38.94
Has > 1 assets of transportation	1.82	7.27	15.91	27.73	43.38	19.20
Has > 1 assets of electronic	20.00	35.91	52.73	65.00	84.93	51.68
Number of Observation	**220**	**220**	**220**	**220**	**219**	

Source: Authors' calculations based on Susenas data

Based on the description above, there are differences in the socioeconomic characteristics of households in Brebes Regency and East Jakarta City. There are differences in variations, especially in asset ownership, floor area per capita, household head employment sector, and household members' education level. With these differences in characteristics, the next analysis will look at the results of the welfare status ranking based on the PMT and Wealth Index methods.

3.2. Comparison of PMT Modeling and Wealth Index Results

In this study, the comparison between the results of the welfare ranking between the PMT model and the Wealth Index is conducted using two approaches, namely based on the characteristics of households according to their welfare level and based on the proportion of errors in classification (Inclusion Error/Exclusion Error). The comparison of the socioeconomic characteristics of households according to their welfare status was made to compare the patterns or trends in the results of the PMT model and the Wealth Index by taking into account the socioeconomic characteristics of households based on the factual data obtained from the Susenas results and by taking into account the regency or city region. The PMT modeling results can be seen in Appendix A1 and A2, while the PCA results for each region can be seen in Appendix B1 and B2.

Based on several demographic characteristics in Brebes from the ranking of welfare status according to quantile groups, it can be seen that using the PMT model, the characteristics and trends follow the pattern of the characteristics based on the ranking of per capita expenditure data obtained from Susenas. The results of the PMT model show, for example, that the higher the welfare level, the greater the proportion of household members with a senior high school education. That also includes the number of household members aged 65 years and over, where the higher the welfare level, the fewer the number of household members aged 65 years and over. However, if we look at the results of the ranking of welfare status using the Wealth Index method, we see anomalies in several demographic variables. For example, in relation to household members' education level, the Wealth Index model shows that the higher the level of welfare, the lower the proportion of household members with a senior high school education. Furthermore, the number of household members aged 65 years and above in quantile group 5 shows the largest number compared to the other quantile groups.

Different results were found for characteristics in East Jakarta compared to Brebes's findings. For example, the education level of household members at the senior high school level. The results of the PMT model show that the higher the welfare level, the greater the proportion of household members with a Bachelor/Master/Doctoral education, both when using the welfare status based on the PMT model and the Wealth Index. The same is true for the number of household members aged 65 and above, where the higher the welfare level, the greater the number of household members aged 65 and above. That shows that the PMT model and the Wealth Index are more consistent in ranking welfare status based on demographic variables in East Jakarta than Brebes's results.

Table 7. Comparison of Demographic Characteristics by PMT Quantile and Wealth Index

Methods	Variables	Quantile				
		Lowest	Second	Middle	Fourth	Highest
Brebes's PMT Modeling	**Average number of household members by age groups**					
	0-4	0.49	0.24	0.14	0.07	0.08
	5-19	1.26	0.99	0.75	0.64	0.51
	20-64	1.95	2.01	1.93	1.91	1.85
	65+	0.31	0.23	0.23	0.13	0.08
	Educational attainment of HH Members					
	Primary School	30.39	29.99	33.59	29.32	20.87
	Junior High School	11.04	14.77	11.81	14.96	17.82
	Senior High School	6.28	9.79	10.65	12.94	22.55
	Diploma	0.00	0.00	0.34	0.42	4.42
	Bachelor/Master/Doctoral	0.00	0.34	0.60	0.94	10.16
	Number HH members	4.01	3.47	3.04	2.74	2.53
Brebes's Wealth Index	**Average number of household members by age groups**					
	0-4	0.19	0.20	0.23	0.19	0.20
	5-19	0.88	0.88	0.90	0.87	0.63
	20-64	1.84	2.02	2.17	2.00	1.61
	65+	0.24	0.10	0.11	0.19	0.34
	Educational attainment of HH Members					
	Primary School	30.50	22.64	35.06	28.74	27.26
	Junior High School	13.98	10.86	17.72	16.55	11.29
	Senior High School	11.71	18.30	12.83	12.03	7.26
	Diploma	0.55	3.18	1.31	0.12	0.00
	Bachelor/Master/Doctoral	0.62	8.63	0.98	1.76	0.00
	Number HH members	3.15	3.20	3.42	3.25	2.78
East Jakarta's PMT Modeling	**Average number of household members by age groups**					
	0-4	0.42	0.26	0.15	0.15	0.06
	5-19	1.70	0.95	0.59	0.59	0.37
	20-64	2.35	2.26	2.07	1.84	1.81
	65+	0.05	0.10	0.16	0.21	0.43
	Educational attainment of HH Members					
	Primary School	13.66	11.43	13.28	13.09	4.36
	Junior High School	14.72	14.61	13.60	11.25	7.67
	Senior High School	34.11	43.92	43.67	39.99	37.12
	Diploma	1.63	1.55	3.62	6.70	8.68
	Bachelor/Master/Doctoral	1.21	2.83	6.78	14.15	35.13
	Number HH members	4.51	3.59	2.97	2.79	2.68
East Jakarta's Wealth Index	**Average number of household members by age group**					
	0-4	0.26	0.22	0.24	0.19	0.14
	5-19	1.07	0.86	0.75	0.88	0.64
	20-64	2.16	2.05	2.00	1.98	2.14
	65+	0.07	0.15	0.15	0.21	0.37

Methods	Variables	Quantile				
		Lowest	Second	Middle	Fourth	Highest
	Educational attainment of HH Members					
	Primary School	14.50	15.33	11.44	9.70	4.86
	Junior High School	13.62	13.32	15.78	11.16	7.98
	Senior High School	40.90	42.87	44.11	39.71	31.20
	Diploma	2.05	2.35	2.89	5.61	9.27
	Bachelor/Master/Doctoral	2.74	3.86	3.63	14.67	35.18
	Number HH members	3.57	3.29	3.13	3.26	3.30

Source: Authors' calculations based on Susenas data

A look at the results of the ranking of household welfare based on socioeconomic characteristics in Brebes Regency in Table 8 generally shows that the ranking of household welfare based on the PMT model follows the pattern of the characteristics based on the ranking results based on per capita expenditure data obtained from Susenas. However, the opposite is true when using the results of the ranking of welfare status using the Wealth Index, where several variables show different trends and patterns when compared with the ranking results based on the per capita expenditure data obtained from Susenas. An example is the sector of employment of the household head, where when using the Wealth Index, the top group shows the highest proportion of households with household heads working in the agricultural sector. In contrast, based on the ranking from Susenas, this group should have the lowest percentage. The same applies when looking at the employment status of the household head. Based on the PMT model, the proportion of households where the head of the household is a formal worker is highest among households in quantile 5. However, using the wealth index, the highest proportion is quantile 2. For the results of the ranking of household welfare based on socioeconomic characteristics in East Jakarta City using the Wealth Index, this study found a pattern similar to the demographic variables, which showed a tendency to follow the pattern of the characteristics based on the ranking results based on per capita expenditure data obtained from Susenas.

Table 8. Comparison of Socioeconomic Characteristics Based on Quantile PMT and Wealth Index

Methods	Variables	Quantile				
		Lowest	Second	Middle	Fourth	Highest
Brebes's PMT Modeling	Employment sector of HH head (1 = agricultural; 0 = other)	59.28	46.11	42.77	36.75	26.51
	Employment status of HH head (1 = formal; 0 = other)	19.76	18.56	16.87	18.67	31.33
	Percapita House size (m^2)	20.68	26.04	28.89	35.55	45.79
	Has acces to electricity	100.00	100.00	100.00	100.00	100.00
	Has acces to water	65.27	67.07	63.25	59.64	53.61
	Has acces to sanitation	68.86	74.25	82.53	87.95	87.35
Brebes's Wealth Index	Employment sector of HH head (1 = agricultural; 0 = other)	41.32	30.54	40.36	46.39	53.01
	Employment status of HH head (1 = formal; 0 = other)	22.16	28.74	22.29	15.66	16.27
	Percapita House size (m^2)	28.62	34.86	30.74	28.68	33.95
	Has acces to electricity	100.00	100.00	100.00	100.00	100.00
	Has acces to water	60.48	40.72	76.51	56.63	74.70
	Has acces to sanitation	19.76	81.44	100.00	100.00	100.00
East Jakarta's PMT Modeling	Employment sector of HH head (1 = agricultural; 0 = other)	0.91	0.45	0.91	1.82	1.37

Methods	Variables	Quantile				
		Lowest	Second	Middle	Fourth	Highest
	Employment status of HH head (1 = formal; 0 = other)	46.82	51.36	41.82	40.00	45.66
	Percapita House size (m^2)	9.28	15.05	22.63	33.93	65.28
	Has acces to electricity	100.00	100.00	100.00	100.00	99.54
	Has acces to water	24.55	26.36	30.45	21.82	11.42
	Has acces to sanitation	93.18	95.91	95.45	95.91	89.50
East Jakarta's Wealth Index	Employment sector of HH head (1 = agricultural; 0 = other)	0.00	1.36	1.36	0.91	1.83
	Employment status of HH head (1 = formal; 0 = other)	42.73	42.27	44.09	47.73	48.86
	Percapita House size (m^2)	13.62	21.37	22.03	32.20	56.92
	Has acces to electricity	100.00	100.00	99.55	100.00	100.00
	Has acces to water	27.27	35.00	26.36	19.09	6.85
	Has acces to sanitation	100.00	98.18	86.36	93.18	92.24

Source: Authors' calculations based on Susenas data

The same trend and pattern also occurs with the asset ownership variable. In Brebes Regency, the results of the ranking using the PMT model show a pattern where the higher the welfare level, the greater the proportion of households that own assets, but if the Wealth Index is used, there are anomalies in several types of assets, such as jewelry ownership, where the group of households in the fifth quantile is the group of households with the lowest proportion of households that own jewelry. Different results were found for East Jakarta City, where both the ranking using the PMT model and the Wealth Index showed a trend that followed the ranking data based on per capita expenditure data obtained from Susenas, namely that the higher the household welfare status, the greater the proportion of households that owned assets.

Table 9. Comparison of Asset Ownership by PMT Quantile and Wealth Aset

Methods	Variables	Quantile				
		Lowest	Second	Middle	Fourth	Highest
Brebes's PMT Modeling	Has Jewelry	0.00	2.99	6.02	13.86	40.36
	Has Motorcycle	58.08	77.25	81.93	81.33	96.39
	Has Boat	2.40	0.00	0.00	0.60	0.00
	Has AC	0.00	0.60	0.00	1.20	12.65
	Has Wheater	0.60	0.00	1.20	1.20	4.82
	Has Fridge	22.16	40.12	52.41	64.46	75.90
	Has Motorboat	1.20	0.00	0.00	0.00	0.00
	Has Car	0.00	0.00	0.60	1.20	28.92
	Has Phone	0.00	0.00	0.60	0.00	0.60
	Has Computer	1.80	1.80	1.81	4.22	25.90
	Has > 1 assets of transportation	1.80	0.00	0.60	1.81	28.92
	Has > 1 assets of electronic	1.80	1.20	1.81	4.22	28.31
Brebes's Wealth Index	Has Jewelry	7.78	20.96	18.07	11.45	4.82
	Has Motorcycle	76.05	84.43	99.40	91.57	43.37
	Has Boat	1.20	0.00	1.20	0.60	0.00
	Has AC	0.60	11.38	1.81	0.00	0.60
	Has Wheater	1.80	3.59	1.20	0.60	0.60
	Has Fridge	43.11	76.05	96.39	28.92	10.24
	Has Motorboat	0.00	0.00	0.60	0.00	0.60

Methods	Variables	Quantile				
		Lowest	Second	Middle	Fourth	Highest
	Has Car	4.19	23.95	1.81	0.00	0.60
	Has Phone	0.00	0.60	0.60	0.00	0.00
	Has Computer	5.39	27.54	2.41	0.00	0.00
	Has > 1 assets of transportation	4.79	23.95	3.61	0.00	0.60
	Has > 1 assets of electronic	5.39	29.34	2.41	0.00	0.00
East Jakarta's PMT Modeling	Has Jewelry	5.91	14.09	24.55	41.82	70.32
	Has Motorcycle	79.55	85.00	73.18	70.00	74.43
	Has Boat	0.45	0.00	0.45	1.36	1.37
	Has AC	12.73	19.55	32.27	51.36	89.04
	Has Wheater	0.00	1.82	0.45	6.36	22.37
	Has Fridge	80.45	89.55	91.36	95.45	98.17
	Has Motorboat	0.45	0.00	0.00	0.00	0.91
	Has Car	0.00	0.45	4.55	30.45	74.89
	Has Phone	0.45	0.45	1.36	6.36	27.85
	Has Computer	15.00	18.64	38.18	46.82	76.26
	Has > 1 assets of transportation	0.00	0.45	4.55	29.55	61.64
	Has > 1 assets of electronic	23.18	31.82	48.18	62.73	92.69
East Jakarta's Wealth Index	Has Jewelry	0.00	2.27	21.82	52.27	80.37
	Has Motorcycle	90.00	76.36	63.64	76.82	75.34
	Has Boat	0.00	0.00	0.91	1.82	0.91
	Has AC	11.36	18.18	20.91	60.45	94.06
	Has Wheater	0.45	0.00	1.82	2.27	26.48
	Has Fridge	90.00	84.55	84.55	97.73	98.17
	Has Motorboat	0.45	0.00	0.00	0.00	0.91
	Has Car	0.00	0.00	4.55	25.45	80.37
	Has Phone	0.00	0.00	0.45	5.91	30.14
	Has Computer	0.00	25.00	26.82	58.18	84.93
	Has > 1 assets of transportation	0.00	0.00	4.55	25.45	66.21
	Has > 1 assets of electronic	10.00	33.64	40.45	76.82	97.72

Source: Authors' calculations based on Susenas data

The second approach in comparing the PMT and Wealth Index results is to compare the value of the proportion of errors through inclusion/exclusion errors in each method. The classification results for each method can be seen in Table 10. The IE/EE in the Brebes Regency resulting from the PMT model has a smaller value, almost half compared to the IE/EE of the Wealth Index method. That indicates that the PMT model ranks more appropriately than the Wealth Index method. The same thing happened in East Jakarta City, where the IE/EE generated from the PMT model was 10.37, while the Wealth Index method produced an IE/EE value of 14.74. These two results prove that the PMT model is still reliable for ranking households in both regions. This methodology's strength lies in its utilization of the expenditure variable as a proxy for household welfare. By employing expenditure as the dependent variable in the regression model, the PMT methodology can assess the connection between household welfare and a range of poverty-related indicators or "proxies." That, in turn, enhances the precision of identifying impoverished households for social protection programs. It is crucial to recognize, however, that the accuracy of the PMT methodology hinges on the quality and appropriateness of the proxies employed and the statistical methods used to estimate the regression model [17].

It should be noted that this does not mean that the Wealth Index method cannot be an alternative in ranking households. The wealth index is considered an effective measure used in the long term for ranking and determining a household's standard of living or welfare level [18]. That is based on the constituent indicators of the wealth index in the form of housing information and asset ownership, where these two groups of indicators tend to be less volatile than expenditure or income. Moreover, the Wealth Index method has been used in various countries, especially low- and middle-income countries. That is because, in these countries, household expenditure data is very difficult to collect, so in meeting the targeting of assistance, the Wealth Index is the best alternative to implement.

Table 10. Comparison of Per Capita Expenditure Quantile Classification with PMT and Wealth Index Result Quantiles

Methods	Per Capita Expenditure Quantile	Quantile					Inclusion/ Exclusion Error
		Lowest	Second	Middle	Fourth	Highest	
Brebes's PMT Modeling	Lowest	85	43	26	10	3	
	Second	40	50	41	28	8	
	Middle	27	45	44	38	12	13.94
	Fourth	11	22	38	53	42	
	Highest	4	7	17	37	101	
Brebes's Wealth Index	Lowest	45	18	18	40	46	
	Second	29	33	38	32	35	
	Middle	37	27	37	27	38	25.12
	Fourth	28	34	36	38	30	
	Highest	28	55	37	29	17	
East Jakarta's PMT Modeling	Lowest	121	69	22	5	3	
	Second	61	75	63	16	5	
	Middle	28	54	67	59	12	10.37
	Fourth	9	20	57	84	50	
	Highest	1	2	11	56	149	
East Jakarta's Wealth Index	Lowest	90	59	53	16	2	
	Second	68	61	51	33	7	
	Middle	33	52	54	65	16	14.74
	Fourth	25	34	44	63	54	
	Highest	4	14	18	43	140	

Source: Authors' calculations based on Susenas data

4. Conclusion

This study found that based on a comparison of the socioeconomic characteristics of households according to household welfare status, the results of the PMT model and the Wealth Index by comparing the socioeconomic characteristics of households based on factual data obtained from Susenas results have different results for Brebes Regency and East Jakarta City. Based on several demographic, socioeconomic, and asset ownership characteristics, the welfare status ranking using the PMT model generally follows the ranking results' characteristic pattern based on per capita expenditure data from the Susenas data in both Brebes Regency and East Jakarta City. Meanwhile, when viewed based on demographic, socioeconomic, and asset ownership characteristics using the Wealth Index method, only in East Jakarta does the tendency follow the characteristic pattern of the ranking results based on per capita expenditure data from the Susenas data. The difference in results using the Wealth Index method in the ranking of welfare states in Brebes Regency and East Jakarta City is influenced by the wealth variable, in this case, related to household asset ownership in Brebes, which tends to be homogeneous, namely motorcycles and refrigerators.

Meanwhile, when looking at the ranking results of the PMT model and the Wealth Index based on the level of misclassification done by looking at the IE/EE value, this study finds that the PMT model is better than the Wealth Index method in both Brebes Regency and East Jakarta City. However, the IE/EE value of the Wealth Index method in East Jakarta City is a manageable gap with the IE/EE value of the PMT model results. In general, this research emphasizes that the results of the ranking of household welfare status are not only influenced by the method used but also by the socioeconomic conditions and characteristics of households data in the areas targeted by the program.

Most variables and indicators used in the PMT model and the Wealth Index method are housing and asset ownership descriptions. To increase the sharpness of the results of both methods, we recommend adding a quality component to housing information and asset ownership. The quality component in each variable can be a weight to enrich the information that will be applied to each ranking method. The addition of quality is also useful to overcome the homogeneity of the data so that both the PMT model and the Wealth Index method are better at ranking households as the variation of the data used increases.

Appendices

Appendix A1 Estimated Brebes's PMT Models

	Estimate	S. E.	t value	p-value
Demographic				
Number of family members:				
Aged 0-4 years	0.06	0.03	2.37	0.02
Aged 5-19 years	0.11	0.02	5.14	0.00
Aged 20-64	0.11	0.02	5.98	0.00
Number of male family members	0.03	0.01	2.53	0.01
Education				
Proportion of household members who finished:				
Junior high school	0.17	0.04	4.14	0.00
Senior high school	0.19	0.05	4.12	0.00
Diploma	0.69	0.14	4.90	0.00
Bachelor/master/doctoral	0.41	0.09	4.76	0.00
Working sector and status				
Number of household members working in:				
Agriculture sector & its status Self-employed	0.05	0.03	1.82	0.07
Agriculture sector & their status Business assisted by permanent workers/paid laborers	0.11	0.05	2.40	0.02
Industrial sector & its status Self-employed	0.07	0.05	1.65	0.10
Industrial sector & its status Business assisted by non-permanent/unpaid laborers	0.15	0.08	1.83	0.07
Industrial sector & its status Business assisted by permanent/paid laborers	0.28	0.10	2.85	0.00
Industrial sector & status Laborer/employee	0.10	0.02	4.37	0.00
Industrial sector & status Freelancers	0.12	0.03	4.64	0.00
Services sector & its status Self-employed	0.04	0.02	2.71	0.01
Services sector & its status Business assisted by non-permanent/unpaid laborers	0.05	0.03	1.59	0.11

	Estimate	S. E.	t value	p-value
the Services sector & its status				
Business assisted by permanent/paid laborers	0.31	0.05	5.98	0.00
the Services sector & their status Laborers/employees/employees	0.08	0.02	4.20	0.00
Services sector & their status Family workers/unpaid workers	0.17	0.05	3.71	0.00
Housing				
Number of household member	-0.47	0.03	-14.26	0.00
Quadratic number of household member	0.02	0.00	6.76	0.00
Ownership status of the residential building occupied:				
Self-owned	0.09	0.03	3.32	0.00
Rent/contract	0.12	0.07	1.58	0.11
Main source of lighting:				
PLN electricity with meter/without meter	1.04	0.45	2.29	0.02
Main fuel/energy for cooking:				
Electricity	0.27	0.17	1.56	0.12
5.5kg LPG/blue gaz/Elpiji 12kg/Elpiji 3kg/City gas/Biogas	0.10	0.03	3.79	0.00
Main source of drinking water:				
Branded bottled water	0.66	0.14	4.65	0.00
Refill water, tap water	0.44	0.13	3.33	0.00
Drilled/pumped wells, Protected wells, Protected springs	0.39	0.13	2.90	0.00
Unprotected wells, unprotected springs	0.23	0.14	1.69	0.09
Fecal landfill:				
Septic tank/WWTP	0.07	0.02	3.61	0.00
Earthen pit	0.12	0.08	1.52	0.13
Widest floor type:				
Marble/Ceramic/Granite/Parquet/ vinyl/carpet	0.13	0.02	7.04	0.00
The widest type of roof:				
Concrete	0.32	0.07	4.46	0.00
Asset				
Household has movable assets:				
Car	0.37	0.04	9.66	0.00
Computer	0.15	0.03	4.68	0.00
Fridge	0.07	0.02	4.01	0.00
Jewelry	0.21	0.02	9.32	0.00
Motorboat	-0.36	0.15	-2.34	0.02
Motorcycle	0.21	0.02	10.21	0.00
Phone	0.12	0.09	1.45	0.15
(Intercept)	12.97	0.47	27.39	0.00
F	67.46 (0.00)			
R^2	0.45			
Adj- R^2	0.44			

Source: Authors' calculations based on Susenas data

Appendix A2 Estimated East Jakarta's PMT Models

	Estimate	S. E.	t value	p-value
Demographic				
Number of family members:				
Aged 5-19 years	0.03	0.01	3.70	0.00
Number of male family members	0.02	0.01	2.13	0.03
Education				
Proportion of household members who finished:				
Junior high school	0.06	0.03	1.95	0.05
Senior high school	0.19	0.02	7.69	0.00
Diploma	0.32	0.05	6.10	0.00
Bachelor/master/doctoral	0.48	0.04	11.95	0.00
Working sector and status				
Number of household members working in:				
Agriculture sector & their status Business assisted by permanent workers/paid laborers	0.50	0.28	1.76	0.08
Agriculture sector & their status Laborers/employees/employees laborers	0.14	0.07	1.87	0.06
Industrial sector & its status Self-employed	0.08	0.04	2.01	0.04
Industrial sector & its status Business assisted by permanent/paid laborers	0.25	0.08	3.14	0.00
Industrial sector & status Laborer/employee	0.12	0.01	8.88	0.00
Industrial sector & their status Family workers/unpaid workers	0.52	0.17	3.12	0.00
Services sector & its status Self-employed	0.07	0.01	5.40	0.00
Services sector & its status Business assisted by non-permanent/unpaid laborers	0.08	0.03	2.36	0.02
Services sector & its status Business assisted by permanent/paid laborers	0.20	0.04	5.34	0.00
Services sector & status Laborer/employee	0.09	0.01	9.46	0.00
Services sector & their status Family workers/unpaid workers	0.07	0.03	2.40	0.02
Housing				
Number of household member	-0.48	0.02	-26.81	0.00
Quadratic number of household member	0.03	0.00	14.59	0.00
Ownership status of the residential building occupied:				
Self-owned	0.12	0.01	9.53	0.00
The official residence	0.17	0.04	3.95	0.00
Main source of lighting:				
PLN electricity with meter/without meter	-0.44	0.23	-1.87	0.06
Fecal landfill:				
Natural Disposal	0.07	0.05	1.49	0.14
Other	-0.17	0.11	-1.58	0.12
Toilet type, ownership and use of defecation facilities:				
Private & Gooseneck	0.09	0.02	4.10	0.00
Private & Plengsengan with lid/Plengsengan without lid	0.45	0.13	3.49	0.00

	Estimate	S. E.	t value	p-value
The widest type of roof:				
Asbestos/zinc/bamboo/wood/shingles	-0.12	0.01	-9.72	0.00
Assets				
Household has movable assets:				
Car	0.43	0.02	22.18	0.00
Computer	0.14	0.02	9.11	0.00
Fridge	0.07	0.02	3.76	0.00
Jewelry	0.11	0.01	7.40	0.00
Motorcycle	0.09	0.02	5.59	0.00
Boat	0.18	0.10	1.83	0.07
Phone	0.23	0.02	10.46	0.00
(Intercept)	15.52	0.24	65.88	0.00
F	216.29 (0.00)			
R^2	0.62			
Adj-R^2	0.61			

Source: Authors' calculations based on Susenas data

Appendix B1 Estimated Rotated Component Matrix, KMO, and Bartlett's Test of Brebes Regency

	Component			
	1	2	3	4
Floor type (marble/ceramic=1, others=0)	0.15	0.20	0.71	-0.04
Wall type (wall=1, others=0)	0.20	-0.01	0.66	0.03
Main source of water (branded bottled water/refill water=1, others=0)	0.06	-0.06	-0.04	0.79
Main source of lighting (PLN electricity with meter=1, others=0)	-0.01	-0.01	0.64	0.02
Toilet ownership status (own toilet=1, others=0)	0.84	0.07	0.14	0.08
Toilet type (Gooseneck=1, others=0)	0.88	0.04	0.15	0.04
Fecal landfill type (Septic tank/WWTP=1, others=0)	0.82	0.04	0.07	0.07
Household has movable assets (yes=1):				
Jewelry	0.07	0.70	0.09	-0.04
Motorcycle	0.07	0.06	0.29	0.61
Fridge	0.11	0.32	0.46	0.40
Car	0.03	0.79	0.02	0.12
Phone	0.02	0.18	-0.14	0.32
Computer	0.02	0.71	0.09	0.11
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			0.75	
Bartlett's Test of Sphericity	***Approx. Chi-Square***		1916.82	
	df.		78.00	
	Sig.		0.00	

Source: Authors' calculations based on Susenas data

Appendix B2 Estimated Rotated Component Matrix, KMO, and Bartlett's Test of East Jakarta City

	Component		
	1	**2**	**3**
House ownership status (self-owned=1, others=0)	0.378	0.319	-0.196
Floor type (marble/ceramic=1, others=0)	0.456	-0.027	-0.043
Roof type (concrete/tile=1, others=0)	0.546	0.199	-0.117
Main source of water (branded bottled water=1, others=0)	0.668	0.077	0.159
Cooking fuel type (not cooking at home/electric/Elpiji 5.5 kg/blue gaz/Elpiji 12 kg=1, others=0)	0.711	-0.023	-0.072
Toilet ownership status (own toilet=1, others=0)	0.087	0.764	0.087
Toilet type (Gooseneck=1, others=0)	-0.089	0.705	-0.022
Household has movable assets (yes=1):			
Jewelry	0.649	0.098	0.151
Motorcycle	-0.067	0.041	0.839
Fridge	0.169	0.471	0.388
Car	0.754	0.007	0.219
Phone	0.524	0.002	-0.277
Computer	0.594	0.108	0.457
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			0.83
Bartlett's Test of Sphericity		***Approx. Chi-Square***	2380.15
		df.	78
		Sig.	0.00

Source: Authors' calculations based on Susenas data

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