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Subjective well-being approach for testing money illusion: Evidence using data from Social Weather Stations

Beja, Edsel Jr.

Ateneo de Manila University

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EDSEL L. BEJA JR.

Department of Economics, Ateneo de Manila University, Quezon City 1108, The Philippines
Email: edsel.beja@gmail.com; Telefax: +63-2-4265661

Abstract:

This paper tests money illusion using measures for subjective well-being, nominal income, and price. It tests the hypothesis that there is no money illusion when proportional changes in both nominal income and price do not bring about a change in subjective well-being. The study uses food poverty data from Social Weather Stations as proxy measure for nominal income and food CPI inflation from the Philippine Statistics Authority as proxy measure for price. The findings suggest no money illusion in general. More specifically, the findings provide conclusive evidence of no money illusion for the food-poor but not for the food-nonpoor.

1. INTRODUCTION

The issue that this paper seeks to investigate is money illusion, or the tendency to think of money in nominal terms rather than in real terms. In the absence of money illusion, only the quantities of goods and services bought by an individual can affect utility. Money per se cannot affect utility independently of the equivalent goods and services it represents. The argument is straightforward enough but the determination of the presence or absence of money illusion remains an empirical issue.

The literature presents ways for testing money illusion. I label one way as "indirect test," which draws on Leontief [1939] and Patinkin [1949]. Simply put, the test is to determine whether or not demand functions are homogeneous of degree zero in both nominal income and price. A positive answer means no money illusion: consumer behavior is stable because the purchasing power of the consumer is constant. This test is easy to implement but the problem is that a rejection of the homogeneity stipulation might possibly be an outcome of a misspecification error and not due to money illusion itself.

Another procedure is what I label as "direct test," which seeks to address the limitation of the indirect test. The direct test has two versions. One uses survey data in the tradition of Shafir et al. [1997]; and the other uses laboratory experiments in the tradition of Fehr and Tyran [2001]. Both versions use surrogate markets and/or hypothetical goods in testing money illusion. But concerns on the interpretation of survey and experimental findings arise when the people are not in full control of their situation. Factors such as corporate power, political expediency, or class interest might restrict choices and/or limit purchasing

power, and so the analysis is not really effective in testing money illusion. Moreover, issues like strategic responses to surveys and cognitive biases in simulated environments might lead to misleading or conflicting findings.

I point out that the literature on subjective well-being (SWB) presents a third way to test money illusion, and I label it the "SWB approach". The first to demonstrate the procedure is Boes et al. [2007]. A recent study is Deckers et al. [2016]. The SWB approach, which I use in this paper, relies on a homogeneity stipulation (indirect test) and uses survey data (direct test) yet assumes no direct association between the SWB data and the nominal income and price data.[1] The procedure then tests whether or not proportional changes in both nominal income and price bring about a change in SWB. The decision point is as follows: money illusion is not present when the effect of a change in nominal income on SWB "cancels out" the effect of a change in price on SWB.

The paper is in four parts. Part 2 outlines the methodology. Part 3 discusses the findings. The last part of the paper is the conclusion.

2. METHOD

2.1 Empirical Framework

Consider a function like

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[1] Frijters and van Praag [1998], Frey and Stutzer [2000], and Di Tella et al. [2001] are the early studies that use a subjective well-being approach for nonmarket valuation exercises. See Welsch and Kühling [2009] and Frey et al. [2010] for reviews.

$$H = F(R) \tag{1}$$

where H is the subjective well-being (SWB) of a person and R is the real income of the same individual. SWB is a personal appraisal on how life is turning out to be good enough at a particular juncture. Kahneman et al. [1997] asserts that SWB is an approximation of the real or internal well-being of a person. Standard economics suggests $F_R > 0$.[2]

Research finds that evaluative and affective assessments comprise SWB. Each one is not only objectively (Kahneman et al. [1999]) but also separately measurable (Diener and Emmons [1985]; Lucas et al. [1996]). However, I use evaluations only because of the view that they exhibit stable properties than affections do (Krueger and Schkade [2008]).[3] Discrepancies between internal situation and external articulation are partly due to human error (Kahneman et al. [1997]; Kahneman and Sugden [2005]; Di Tella and MacCulloch [2006]).

A restatement of Equation (1) is

$$H = F(Y, P), \tag{2}$$

where Y is the nominal income of a person; and P is the price that the person faces. From

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[2] I take $F_R > 0$ as a short-run relationship between SWB and real income. The long-run context specifies $F_R \geq 0$, which coheres with Easterlin (1974; see also Easterlin 2015, 2016).

[3] Affections lead to exaggerated evaluations because of focusing illusion (Schkade and Kahneman [1998]), projection bias (Gilbert et al. [1998]), visceral reaction (Loewenstein [1996]), or other hedonic-linked effects like existence value (Kahneman and Knetsch [1992]). Evaluations need not bring excessive volatility to the analysis to cause spurious findings.

standard economics, the expectations are $F_Y > 0$ and $F_p < 0$. I apply total differentiation and manipulate the results to get

$$dH/H = \frac{F_Y}{F}\frac{dY}{Y}Y - \frac{F_P}{F}\frac{dP}{P}P \qquad (3a)$$

$$dH/H = \varepsilon_Y \frac{dY}{Y} - \varepsilon_P \frac{dP}{P} \qquad (3b)$$

Equation (3b) shows that the relevant elasticities (in absolute values) of F(Y, P) are ε_Y and ε_P, respectively. Let $dY/Y = dP/P = m > 0$. Thus,

$$dH/H = (\varepsilon_Y - \varepsilon_P)m \qquad (4)$$

Recall, no money illusion requires that the effect of a change in nominal income on SWB "cancels out" the effect of a change price on SWB. Given Equation (4), no money illusion means $(\varepsilon_Y - \varepsilon_P) = 0$.

2.2 Model for Estimation

For the analysis, I specify a structural model like

$$H_{ij} = \alpha_1 + \beta_1 \ln Y_{ij} + \beta_2 \ln P_{ij} + \varphi'\mathbf{X} + e_{ij} \qquad (5)$$

where $\mathbf{X}$ is a set of standard control variables, e is the usual residual term, and subscripts i and j refer to a person dimension and a time dimension, respectively. From Equation (4),

the test for money illusion is $\beta_1 = |\beta_2|$; or, as another version, $\beta_1/|\beta_2| = 1$.

The above specification is similar to Boes et al. [2007] and Deckers et al. [2016]. In this paper, though, I estimate Equation (5) by means of the logit regression procedure (see details of the data below).

2.3 Description of Data

a. Subjective well-being

For the analysis, I use life satisfaction as a proxy measure for SWB. The raw data are from Social Weather Stations (SWS).[4]

The query of SWS for life satisfaction states: *"On the whole, are you [1] very satisfied, [2] fairly satisfied, [3] not fairly satisfied, or [4] not at all satisfied with your life experience?"* I recode the raw data to form a binary variable whose value of 1 means "satisfied" (i.e., either "very satisfied" or "fairly satisfied") and 0 means "not satisfied" (i.e., either "not fairly satisfied" or "not at all satisfied"). Doing so increases the number of observations for each category and helps enhance the robustness of the analysis.

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[4] Established in 1985, Social Weather Stations (SWS) is a private, non-stock, and not-for-profit survey and research institution in the Philippines. As a self-supporting entity, SWS describes its operations as neutral and non-partisan. SWS pioneered the collection of primary data on, among others, quality of life and well-being and contemporary social issues like governance, election, etc. It is the local partner of international surveys like Gallup World Poll, International Social Survey Programme, and World Values Survey. See: https://www.sws.org.ph/swsmain/home/

b. Income

SWS does not collect data for nominal income in each survey. Thus, as proxy measure for nominal income, I use the money responses to the query of SWS about what amount is necessary to be food-nonpoor. In the following paragraphs, I describe the survey protocol of SWS and the implication for using the proxy measure.

The query of SWS begins as follows: *"Based on the type of food eaten by your family, where would you place your family in this card?"* The respondent sees a display card that lists in vertical format the possible responses: "not poor" (at the top), "on the line", and "poor" (at the bottom). The respondent merely points out the answer on the display card. I use the label "nonpoor" to mean a response of either "not poor" or "on the line".

SWS proceeds to a follow up query about what the respondent thinks as the amount that a person might need to get out of food poverty. Those who responded "poor" get this query: *"In your opinion, how much money would your family need for food expenses each month in order not to be called poor anymore in terms of food?"* The "nonpoor" in contrast get a different query: *"For a family as large as yours but poor, how much money do you think would it need to spend each month for food expenses in order not to be considered poor anymore in terms of food?"*

In the above protocol, the respondent is thinking about one's actual nominal income, Y^0, and a "desired level" of nominal income, Y. Thus, conceivably, Y^0 is the nominal income of one who is food-poor. This information, however, is also not available in the SWS

surveys.

Of course, there are variations in a personal definition of food poverty; but the contention is that a self-identification procedure contextualizes food poverty as shared experience. This personal appraisal does not depend on an official definition of food poverty. Neither does it need an external observer to identify the food-poor in society. Possibly, a personal threshold is higher than an official threshold of food poverty. But, in the SWS protocol, a person who thought oneself as food-poor would just point to "poor" on the display card because the other options would not be relevant to one's concrete situation.[5]

Notice that the follow up item to the food-poor is a direct query about a personal situation of food poverty. In contrast, the follow up item to the food-nonpoor is in effect an indirect query that asks one to imagine what it is like to be food-poor. This feature in the SWS survey protocol is a useful input later in the interpretation of results; but, at this juncture, I stress that the responses from both food-poor and food-nonpoor comprise what I label as "food poverty gap". Algebraically, the food poverty gap is $y = (Y - Y^0) > 0$.

Using the food poverty gap as a proxy measure for nominal income modifies Equation (2) into $H = F(y, P)$, where $y = (Y - Y^0)$. Logically, the food poverty gap is a positive amount since being food-poor or thinking of being food-poor is always below a "desired state,"

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[5] Ravallion and Lokshin [2001] and Singh-Manoux et al. [2005], for example, point out that self-ratings capture the long-term rather than the short-term or current economic status of a person and, as such, the information already internalizes "shocks". This view parallels the point made earlier about life satisfaction.

which is to be food-nonpoor.[6] In addition, a food poverty gap relates to a lower capacity to meet basic needs and, in turn, implies a negative effect on SWB. The assertion then is that the test on Y in Equation (2) can apply to Y^0 and, by extension, to y as well. The test for money illusion is still $\beta_1 = \beta_2$ or $\beta_1/\beta_2 = 1$, albeit there is no more absolute value sign on β_2 given that the proportional changes in the food poverty gap and the price both lead to negative effects on SWB.

I exclude from the final dataset "unreasonable" amounts for a food poverty gap. I use information from the National Economic and Development Authority and the Philippine Statistical Authority (PSA) as reference in setting the upper threshold of the food poverty gap, namely PhP 21,600 per capita as amount necessary to live a simple but comfortable life and 0.07 as ratio of the official food poverty threshold to the official income poverty threshold.[7] Therefore, "reasonable" amounts for food poverty gap are PhP 15,000 (PhP 21,600 x 0.70) per capita or below. There are no negative amounts for food poverty gap.

b. Inflation

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[6] Consider, again, the idea that people are alike in their views on how best to go about living and enjoying life. What broad category of expenditures is most similar among people? The answer is "food". The key component in the CPI is also food. According to SWS, the food-poor are in most cases the income-poor. I interpret the food poverty gap in the same way as discrepancies in the evaluations between a "desired state" (food-nonpoor) and the "actual state" (food-poor) of a person across life domains (Campbell et al. [1976]; Michalos [1985]; Andrews and Robinson [1991]).

[7] According to National Economic and Development Authority, a gross monthly income of PhP 120,000 for a family of four is necessary to live a simple but comfortable life. The amount per capita is PhP 30,000 gross or PhP 21,600 net of the taxes and the deductions. The ratio of food to income poverty threshold is available from the Philippine Statistical Authority. See: http://www.nscb.gov.ph/secstat/d_income.asp

Data for CPI inflation come from the PSA. Data are available by item category like food, clothing and footwear, housing and utilities, etc., and by geographic area. The base year of the PSA data is 2006.

I use food CPI inflation as an alternative measure to the actual prices of food items that a respondent in the SWS survey purchases, because the latter information is not part of the SWS surveys. Even so, if the food basket in the CPI for an area is reflective of the food consumption pattern of the same area, then food CPI inflation is a useful proxy measure for the prices of the food items purchased in the same area.

c. Other control variables

I include controls for the socioeconomic profile of a person. The variables are age, gender, marital status, employment, schooling, family structure, and family size.

Age is a continuous variable in actual years. Gender is a dummy variable whole value is 1 for male and 0 for female. Marital status is also a dummy variable whose value is 1 for single or had a partner (i.e., separated, divorced, or widowed) and 0 for married or living as married. Employment is likewise a dummy variable whose value is 1 for unemployed and 0 for employed. I exclude in the analysis individuals who are not in the labor force.

Schooling is a categorical variable whose values are 1 if completed elementary-level education or less, 2 if completed secondary-level education, and 3 if completed tertiary-level education or more. Family structure is also categorical variable whose values are 1 if

single-person household, 2 if household is a family with no child, 3 if household is a family with children, 4 if a single-parent household, and 5 if household is an extended family (two or more families). The first category is the reference status for schooling and family structure.

Family size is a continuous variable for the total members in a household. For example, a single parent with one child is a family size of two.

I also include controls for the geographic location of a person in two ways. The first is an urban dummy variable, which takes the value of 1 if the person lives in an urban area and 0 otherwise. The other is a region categorical variable for the following: 1 if a person lives in Metro Manila, 2 if a person lives in (the rest of) Luzon, 3 if a person lives in Visayas, and 4 if a person lives in Mindanao. Metro Manila is the reference status.

Lastly, I include dummy variables for the SWS survey periods. I use 2010 as reference period.

d. Data Schedule and Data Compilation

The timeframe of the analysis is 2010 to 2015. The raw data from SWS and the PSA are accessible to the public.

The quarterly surveys of SWS take place in March, June, September, and December of each year. For the analysis, I limit the coverage to two quarters in each year that contains

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the query on life satisfaction. Each survey contains a sample of 300 for Metro Manila, (the rest of) Luzon, Visayas, and Mindanao, or 1,200 in total.

The relevant queries of SWS included in this paper are the same queries across surveys. This feature in the survey design adds to the integrity of the SWS data.

The PSA collects information on prices each month. The CPI inflation of the previous month is available around the first week of the current month. I obtain the quarterly food CPI inflation in March, for example, as the average of the data between January and March of the current year. The calculation for June, September, and December is a similar process. Given that the PSA data for food CPI inflation rate are available by province, I am able to align the PSA data with the SWS data in terms of timeframe and regions.

3. RESULTS

3.1. Descriptive Results

Figures 1 to 3 present trends for life satisfaction, food poverty gap, and food CPI inflation, respectively. In Figure 1, the graph of average life satisfaction for the food-nonpoor is always higher than the graph for the food-poor ($\Delta \overline{\overline{H}} = 0.28$; $t(8,307) = 16.5$, $p < 0.01$). This pattern is in line with literature in the tradition of Cantril (1965) and Easterlin (1974) which says that subjective well-being (SWB) tends to be higher for the relatively well-off. In turn, Figure 2 shows the graph of average food poverty gap for the food-nonpoor is always higher than the graph for the food-poor ($\Delta \overline{y} = 201$; $t(9,897) = 8.24$, $p < 0.01$). I

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interpret this pattern as partly due an estimation error—that is, the food-nonpoor uses one's personal situation to project what is necessary to be not food-poor anymore and ends up indicating a large amount. But the difference in the amounts between the food-poor and food-nonpoor is not large to be a problem in the analysis. Lastly, in Figure 3, the graph of average CPI inflation for the food-nonpoor is only slightly lower than the graph for the food-poor ($\Delta \overline{P}$ = -0.16; t(9,209) = 3.78, p < 0.01). This pattern reveals that the food-poor pay higher prices for food than the food-nonpoor.

[Insert Figures 1, 2, and 3 Here]

3.2. Empirical Results

Table 1 is a summary of the analysis. I focus on the odds ratio in the discussion that follows. Column 1 of the table shows results for the full dataset, whereas Columns 2 and 3 are results using split datasets for the food-nonpoor and the food-poor, respectively.

I begin with the socioeconomic profile but discuss them in brief because the results are compatible with the literature on SWB. First, on age: the results suggest a concave-shaped relationship between age and SWB—that is, SWB initially falls from a high-point in young adulthood, then reaches a low-point in midlife, but rises thereafter to arrive at another high-point in old age (c.f., Blanchflower and Oswald [2008] and Cheng et al. [2017]). From Table 1, I get the early 50s as the low-point of SWB.

Next, consider food poverty, gender, and employment. Column 1 reports that being food

poor (c.f., Rojas [2015] and Welsch and Biermann [2016]), being male (c.f., Clark [1997] and Graham and Chattopadhyay [2013]), or being jobless (c.f., Clark and Oswald [1994] and Winkelmann and Winkelmann [1998]) means lower odds of experiencing higher SWB. The results suggest that the unemployed regardless of gender and food poverty status experiences lower SWB.

The results for schooling across the three specifications show that completing at least secondary-level education means greater odds of experiencing higher SWB. The results further show that completion of tertiary-level education is better than completion of secondary-level education. Schooling raises SWB because it leads to improvements in the possibilities for economic advancement by means of employment and/or other productive activities (c.f., Witter et al. [1984]; Nikolaev and Rusakov [2016]).

In addition, Table 1 indicates that both jobs and schooling are two of the critical issues for public policy in the Philippines, at least in the context of SWB. In fact, the results support the view that public policy must pursue employment and education together and not treat them in sequence or as separate programs.

Consider next marital status, family structure, and family size. Table 1 shows neutral odds of experiencing higher SWB for the single. The results in Columns 1 to 3 are statistically not significant but the negative sign on the estimate is consistent with the literature (c.f., Diener et al. [2000] and Frey and Stutzer [2006]). The odds of experiencing higher SWB are greater for partnerships regardless of the number of children but neutral for single parents. These results reveal that the family setup plays a central role for SWB. In short,

there is a cultural dimension to SWB. For the family size, the results in Columns 1 to 3 are statistically not significant but the negative coefficient reveals economies of scale in household expenditures.

The results for geographic location are as follows. People who live in urban areas face lower odds of experiencing higher SWB, albeit only the result for the food-nonpoor is statistically significant (c.f., Berry and Okulicz-Kozaryn [2011] and Sorensen [2014]). It is not a surprising finding given that urban living is much more difficult than rural living, on account of the high levels of congestion and pollution, the high incidence of unemployment and criminality, the high cost of living, etc. In addition, Table 1 shows that people in urban areas of the Visayas or Mindanao face lower odds of experiencing higher SWB relative to those in Metro Manila or the urban areas in the rest of Luzon.

Evidently, Table 1 reveals that the odds of experiencing higher SWB are still better in Metro Manila or in the other cities in Luzon notwithstanding the problems that come with urban living. Perhaps this pattern is an outcome of the historical concentration of business enterprises, political affairs, and social activities in Metro Manila and, to some extent, in its immediate surroundings. In this regard, the advances in Metro Manila benefit more the neighboring areas than the distant areas in the Visayas and Mindanao.

Meanwhile, Column 3 suggests that where the food-poor lives is generally neutral to the odds of experiencing higher SWB, except perhaps for the food-poor in the Visayas. In a way, Columns 2 and 3 confirm the shared experiences with respect to food poverty regardless of the location of the food-poor in the Philippines.

Finally, I turn to the topic of money illusion. Observe in Column 1 that higher amounts of food poverty gap lead to lower odds of experiencing higher SWB. Columns 2 and 3 lead to the same reading but only the latter is statistically significant. Correspondingly, observe in Column 1 that higher food CPI inflation lead to lower odds of experiencing higher SWB. The results for food CPI inflation in Columns 2 and 3 are statistically significant.

Observe, further, that the estimates for the effect of food poverty gap and of food CPI inflation on SWB are in line with the expectations: $F_y < 0$ and $F_P < 0$ given $H = F(y, P)$ with $y = (Y - Y^0)$. All the same, the critical evaluation in the context of money illusion concerns the equality of F_y and F_P. Recall that the decision point is $\beta_1 = \beta_2$ or $\beta_1/\beta_2 = 1$.

Accordingly, the post-estimation test results are in the last row of Table 1. In turn, I infer from the results in Column 1 that $\beta_1 = \beta_2$ and $\beta_1/\beta_2 = 1$. I can therefore make a general conclusion of no money illusion. No unambiguous conclusion is possible for Column 2 since the food poverty gap of the food-nonpoor is statistically not significant. In contrast, I can make a definite inference from the results in Column 3: the test cannot reject the null hypotheses of $\beta_1 = \beta_2$ and $\beta_1/\beta_2 = 1$. There is therefore a specific conclusion of no money illusion in the case of the food-poor.

I argue that the above interpretation submits that the food-nonpoor cannot meaningfully envisage what life is like to be food-poor. Of course, given the way SWS collects the data, the food-nonpoor merely imagines what food poverty means. Such attempt remains short of an actual experience of food poverty, and so what the food-nonpoor states as necessary to be food-nonpoor turns out to be not very useful for a test on money illusion. In fact, the

amount that the food-nonpoor indicates is not binding on oneself.

In the end, the above findings lead to the following propositions. The first concerns the approach to analysis and interventions that involve the food-poor and food-nonpoor. This paper highlights the imperative of eliciting what people think of issues that concern them more directly. As such, personal experiences are valuable inputs to analysis and not just secondary information that is useful for validating results. This study also highlights the possibility that people who do not have material experience or direct knowledge of an issue can inadvertently give misleading or inappropriate inputs to the analysis.

Naturally, there are concerns on what meaning to put on information when people in very difficult circumstances report about their affairs and give inputs to policymaking. But such problems are likely to occur when the queries are hypothetical or experimental in nature. I assert, though, that people are generally truthful when asked directly about the status of their lives and about what needs to change to see an improvement their condition. People certainly know what matters most in their lives to make living go well enough to produce higher SWB. And so, it is all right to elicit the views of people about their lives.

The other proposition concerns the role that the food-poor takes in the context of policymaking. This study underscores the fact that seeking ways to help the food-poor in general must begin with the people who are indeed in food poverty—that is, once again, people are the experts of their own affairs. The food-nonpoor can impute or imagine what the food-poor might need but the former can never come to a full grasp of what food poverty means because one is in fact not food-poor. In this regard, there is value in giving

space and empowering the food-poor so they become active participants in the decision-making process that concerns their food poverty. For that reason, a course of action that seeks to enable the food-poor to advance their lives as far as possible and on their own terms must necessarily begin with them.

[Insert Table 1 Here]

4. CONCLUSION

This paper tested money illusion using a procedure based on subjective well-being. The test used data on life satisfaction, food poverty gap, and food CPI inflation. In particular, the paper tested the hypothesis that money illusion is not present when proportional changes in a measure of nominal income and a measure of price do not bring about a change in subjective well-being.

The study found evidence of no money illusion. But the conclusion applied more to the case of the food-poor. There was no sufficient evidence to accept or reject money illusion in the case of food-nonpoor. I interpreted the finding to be saying that the food-poor is really cognizant of the amount needed to bring them out of their difficulty. I argued in the end that people in food poverty are the best judges of their affairs. The food-nonpoor could try to make sensible evaluations of the lives of others but their projections would possibly be misleading or inappropriate given a lack of material or direct experience of food poverty.

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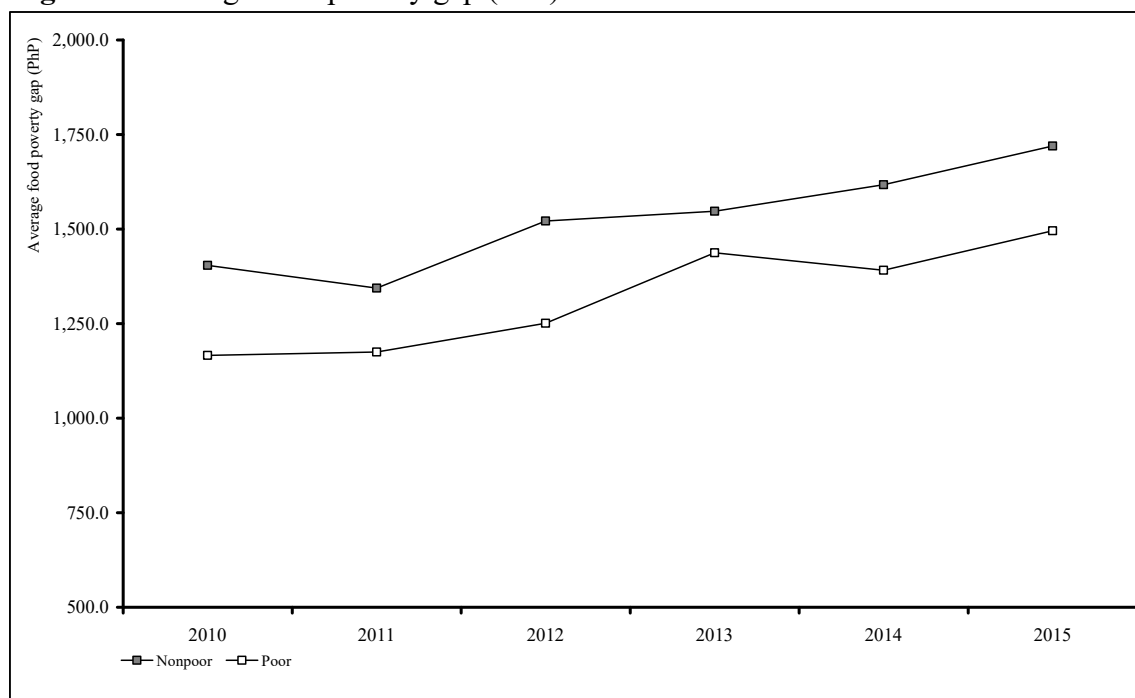
Figure 1: Average life satisfaction
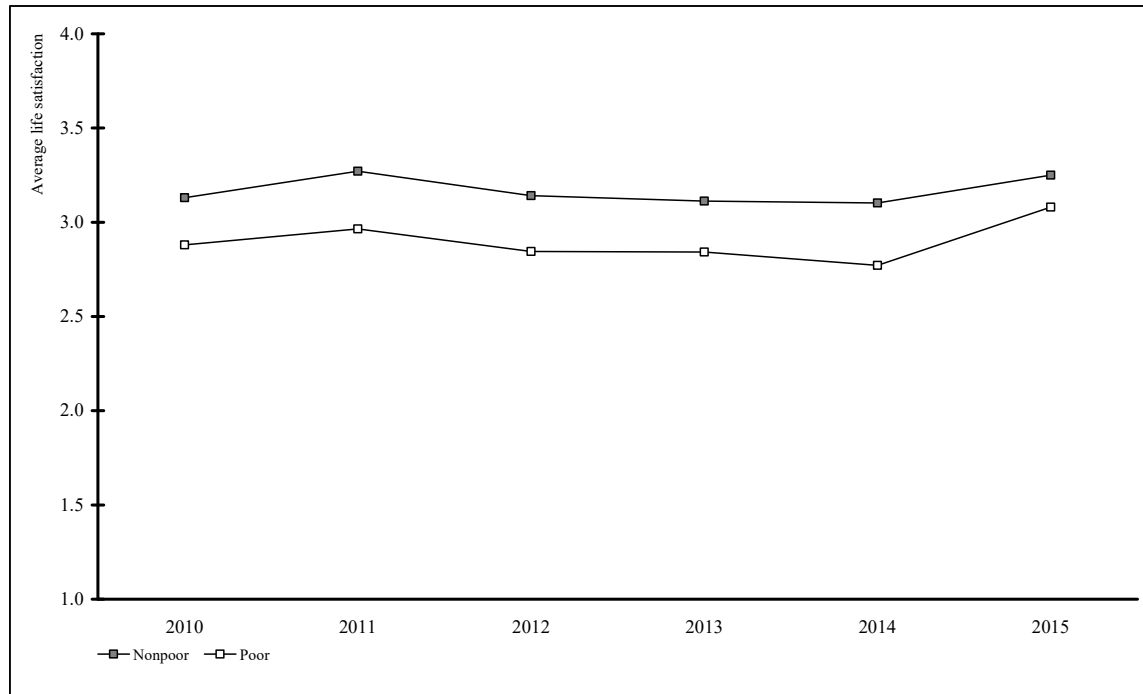
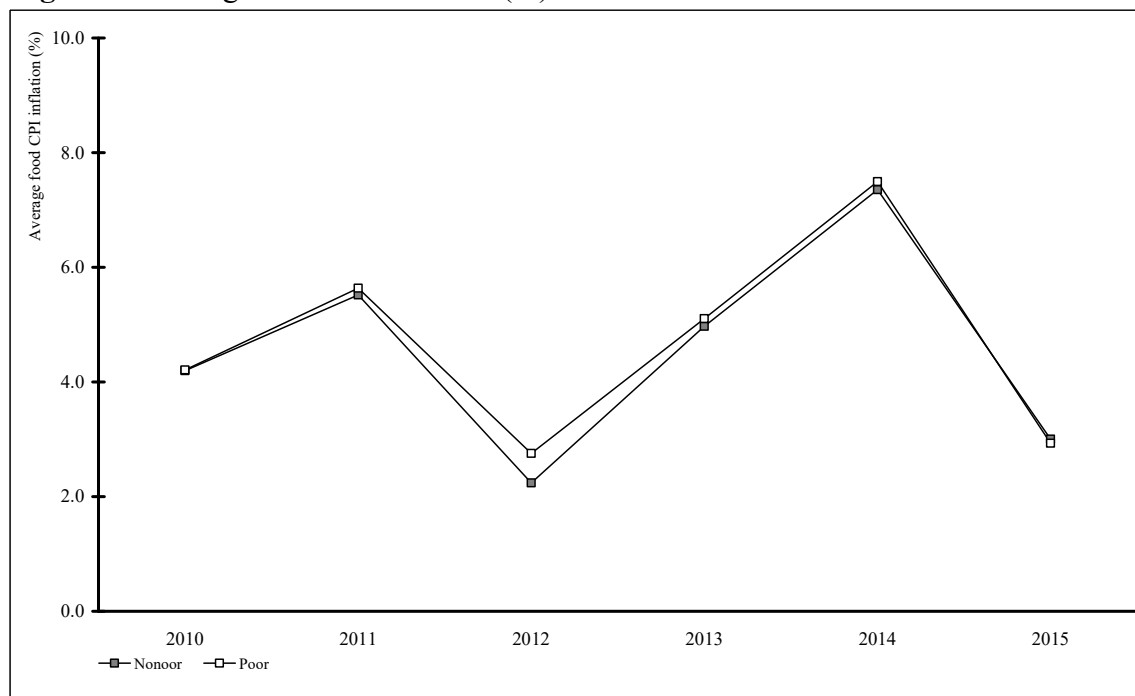Source of raw data: Social Weather Stations

Figure 2: Average food poverty gap (PhP)

Source of raw data: Social Weather Stations

Figure 3: Average food CPI inflation (%)

Source of raw data: Philippine Statistical Authority

Table 1: Logit regression results

	All			Food Nonpoor			Food Poor		
	Estimates	Odds	p-value	Estimates	Odds	p-value	Estimates	Odds	p-value
Constant	3.572	35.6	< 0.001	3.325	27.8	< 0.001	3.167	23.8	< 0.001
Food poverty gap (ln y)	-0.103	0.90	0.009	-0.009	0.99	0.875	-0.199	0.82	< 0.001
Food CPI inflation (ln P)	-0.179	0.84	0.019	-0.174	0.84	0.099	-0.189	0.83	0.089
Family size (ln N)	-0.040	0.96	0.541	-0.117	0.89	0.205	0.046	1.05	0.621
Poor	-0.631	0.53	< 0.001						
Male	-0.132	0.88	0.009	-0.147	0.86	0.040	-0.111	0.90	0.124
Age	-0.043	0.96	< 0.001	-0.060	0.94	< 0.001	-0.026	0.97	0.068
Age-square	0.000	1.00	< 0.001	0.001	1.00	< 0.001	0.000	1.00	0.107
Schooling: secondary	0.087	1.09	0.111	0.158	1.17	0.044	0.018	1.02	0.815
Schooling: tertiary	0.508	1.66	< 0.001	0.501	1.65	< 0.001	0.559	1.75	< 0.001
Single	-0.065	0.94	0.424	-0.108	0.90	0.340	-0.011	0.99	0.927
Unemployed	-0.389	0.68	< 0.001	-0.495	0.61	< 0.001	-0.279	0.76	< 0.001
Family: Couple, no child	0.493	1.64	< 0.001	0.431	1.54	0.026	0.576	1.78	0.005
Family: Couple, children	0.440	1.55	< 0.001	0.446	1.56	0.011	0.462	1.59	0.014
Family: Single parent	0.157	1.17	0.201	0.095	1.10	0.576	0.239	1.27	0.182
Family: Extended family	0.576	1.78	< 0.001	0.393	1.48	0.093	0.780	2.18	0.002
Living in urban center	-0.070	0.93	0.250	-0.145	0.87	0.094	-0.015	0.99	0.864
Area: Luzon	0.107	1.11	0.185	0.146	1.16	0.169	0.070	1.07	0.585
Area: Visayas	-0.341	0.71	< 0.001	-0.328	0.72	0.004	-0.345	0.71	0.006
Area: Mindanao	-0.249	0.78	0.005	-0.375	0.69	0.002	-0.145	0.87	0.277
Year: 2011	0.312	1.37	< 0.001	0.441	1.56	< 0.001	0.178	1.19	0.177
Year: 2012	-0.103	0.90	0.275	-0.140	0.87	0.303	-0.101	0.90	0.445
Year: 2013	-0.004	1.00	0.963	-0.003	1.00	0.976	-0.003	1.00	0.982
Year: 2014	0.043	1.04	0.652	0.163	1.18	0.223	-0.082	0.92	0.544
Year: 2015	0.408	1.50	< 0.001	0.389	1.48	0.004	0.417	1.52	0.005
Post-estimation Test									
Ho: $\beta_1 = \beta_2$ vs Ha: $\beta_1 \neq \beta_2$	Chi-sq(1) = 0.79		0.375	N/A		N/A	Chi-sq(1) = 0.01		0.936
Ho: $\beta_1/\beta_2 = 1$ vs Ha: $\beta_1/\beta_2 \neq 1$	Chi-sq(1) = 1.66		0.197	N/A		N/A	Chi-sq(1) = 0.01		0.939

Notes:

1. The raw dataset includes the two quarters in each year between 2010 and 2015 that contains the SWS query on life satisfaction. The dataset after the iterations contains 10,710 observations.

2. The structural model is $H_{ij} = \alpha_1 + \beta_1 \ln y_{ij} + \beta_2 \ln P_{ij} + \varphi'\mathbf{X} + e_{ij}$. The relevant variables for a test money illusion are H_{ij} (life satisfaction), y_{ij} (food poverty gap), and P_{ij} (food CPI inflation). In the model, $\mathbf{X}$ is a set of control variables as listed in the table. The subscript i is the individual and j is the survey period. Recall that $y = Y - Y^0$, where Y is nominal income (but no data available) and Y^0 is hypothesized nominal income of the food-poor (but not stated by respondent). Only the amounts of y itself are available in the SWS surveys. The parameter expectations are $\beta_1 < 0$ and $\beta_2 < 0$.