

Are facets of *Homo economicus* associated with higher earnings and happiness?*

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Abstract

This paper investigates the individual outcomes of irrational thinking, including paranormality and non-scientific thinking. These modes of thinking were identified by factor analysis from a 2008 survey. Income and happiness are used as measures of performance. Empirical results reveal that non-scientific thinking lowers income, whereas paranormality does not affect it. While non-scientific thinking lowers happiness, paranormality raises it. Extending the model, we find that higher ability and self-control result in higher income and happiness. Selfishness raises income, but diminishes happiness. These results suggest that *Homo economicus* generally achieves higher individual performance except that belief in paranormality raises happiness.

Keywords: paranormality, non-scientific thinking, irrationality, happiness, factor analysis, *Homo economicus*

JEL classification number: D03

1. Introduction

Rationality is the essential assumption of traditional economics, meaning that agents act in a self-interested fashion given their constraints. In addition to rationality the following elements are commonly ascribed to “*Homo economicus*”: unlimited cognitive resources, pure self-interest, and perfect self-control. However, this is not the only possible description of economic agents; *Homo economicus* is often simply adopted for modeling convenience. Therefore, it is interesting to ask: “Does *Homo economicus* exhibit performance that is superior to real-world human beings?” In this paper, we focus on the effect of irrationality on performance, although we also investigate the impact of the other characteristics of *Homo economicus*.⁴

* The authors are grateful to comments by Noah Smith and to financial support by 21st Century Center of Excellence Program of Osaka University.

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⁴ Konow and Earley (2008), based on their dictator game experiment, found that more generous people report greater happiness.

We consider the core of rationality to consist of logical thinking, which is the unique tool by which human beings identify the appropriate actions to achieve their goals. We measure individuals' degree of logical thinking by assessing the degree to which they believe in science and the degree to which they believe in paranormal phenomena. Although these may seem to be two sides of the same coin, they actually have different characteristics.

The majority of Japanese people do not believe in any religion. Nonetheless, belief in paranormal phenomena is popular, especially for the younger generation, as in many countries (Williams 2007, Rice 2003, Peltzer 2003). Thus, belief in paranormal phenomena in Japan, especially among younger individuals, may not stem from religious beliefs, but from superstitions spread by mass media.⁵

We assess an individual's performance with two measures: 1) income, and 2) happiness. Success in the world is often evaluated by income, assets, and social status; attainment of these goals is largely determined by physical laws, although chance also plays a large role. On the other hand, human beings also pursue subjective happiness, which is strongly affected by one's mental condition. Thus, we investigate how paranormality and non-scientific thinking affect both income and happiness.

2. Data and methods

2.1 Data detail

All data used in this paper were obtained from the survey conducted by the COE (Center of Excellence) project of Osaka University in February 2008. We obtained 2,731 observations by the visit-replacement method and 1,287 by mailing method. In this paper, these two samples are pooled and used for the analysis, so that the total number of observation is 4,018.

We designed questions that elicit an individual's degree of belief in paranormality (henceforth "paranormality") and non-scientific thinking; we collectively refer to these two measures as "irrationality." Paranormality is assessed with eight questions; "Spirits and Ghosts exist.", "Heaven exists.", "God or Gods exist.", "Life after death exists.", "God knows about all the wrong things we've done.", "It is possible to move an object by using psychokinesis.", "I believe in fortune telling.", and "A person's blood type indicates their character". Non-scientific thinking is assessed with three questions; "Human beings evolved from other living things.", "You should place a greater value on thinking with your head than with your heart.", and "What is written in science text books is true". Each response is on a five-point scale.

We asked eleven questions concerning irrationality. Needless to say, irrationality is not the sole determinant of the answers to these questions. Therefore we performed a factor analysis on

⁵ Fortunetelling based on blood types or horoscopes is broadcasted daily on many Japanese TV channels.

the set of eleven questions.⁶ We got two factors and named the first factor *PARANORMAL* and the second *NONSCIENTIFIC*.

2.1 Where do belief in paranormality and non-scientific thinking come from?

In this subsection we examine how paranormality and non-scientific thinking emerge. We particularly focus on the effect of the respondents' childhood environments.

From the estimation results, we found females tend to have stronger beliefs in paranormality than males, which is consistent with previous studies (Rice 2003, Wolfradt 1997, Wiseman and Watt 2004, Williams et al. 2007).⁷ Paranormality tends to be strongest when respondents are in their 40s. Those who had higher grades at age 15 tend to exhibit less paranormality, as do those whose parents are more educated. Interestingly, a higher childhood standard of living is associated with more paranormality. Results regarding non-scientific thinking are shown in the right-hand columns. The results are similar to those for paranormality. The only differences are that childhood standard of living is not significant, and that non-scientific thinking monotonically decreases with age. This last result presents an interesting contrast with the result for paranormality. Respondents in their 40s were teenagers around 1978, when paranormal phenomena (spoon-bending by Uri Geller and Kokkuri-san, a kind of table-turning, etc.) were very popular in the media. Therefore, we might be seeing a generational effect.

2.5 Income and happiness as measures of life performance

We use two measures of an agent's life performance: income and happiness. The former is a purely economic measure of performance, while the latter is psychological and self-evaluative. 2007 pretax income (on a 12-point scale) is included as a question in the survey. Following Barsky et al. (1997), we fit a lognormal distribution to the income histogram and estimate the income for each class; this estimation result is called *INCOME*. *HAPPINESS* is defined by the answer to the following question: Overall, how happy would you say you are currently? Using a scale from 0 - 10 where "10" is "very happy" and "0" is "very unhappy", how would you rate you current level of happiness?

3. Estimation results

3.1 Effect of irrationality on income

The estimation results are presented in Table 1. On the left are shown the results when income is regressed over *PARANORMAL*, *NONSCIENTIFIC*, and the other individual variables. When

⁶ Specifically, we use principal factor analysis (PFA) with promax rotation.

⁷ However, Peltzer (2003) finds no significant gender differences among secondary and university students in South Africa.

we regress income on only *PARANORMAL*, *NONSCIENTIFIC*, both variables are significantly negative, implying that paranormal and non-scientific thinking lowers economic performance. However the significance of *PARANORMAL* is lost with the other variables. The maleness dummy, *DMAN*, is significantly positive, as expected. Age and squared age are also significant and positive and negative respectively, implying that income peaks at age 48.

3.2 Effect of irrationality on happiness

Estimation results of the *HAPPINESS* regression are presented in column 2 in Table 1. The left-hand columns show the results when only the two key explanatory variables are included. Interestingly enough, the coefficient on *PARANORMAL* is now positive, indicating that those who believe in paranormal phenomena are happier, while the coefficient on *NONSCIENTIFIC* is significantly negative, implying that non-scientific thinking lowers happiness. This result highlights the substantial functional difference between belief in paranormality and non-scientific thinking.

4. Performance of the *Homo economicus*: An extension

Homo economicus is characterized by rationality, perfect intellectual ability, perfect selfishness, and perfect self-control. Although we have focused on the effects of rationality, it is interesting to ask how the other attributes of *Homo economicus* affect individual performance. In this section, we define proxies for the other aforementioned characteristics of *Homo economicus*, using other answers to our survey questions, and we investigate the effects of each characteristic on our performance measures.

4.1 Definitions of variables

In this subsection, we define the additional variables used in the regression analysis. Higher values of these variables means that subjects are akin to *Homo economicus*.

Intellectual ability (*ABILITY*) is subjects' self-reported school grades at age 15. Respondents were asked to choose from a 5-point scale, from 1 ("in the lower rank") to 5 ("in the higher rank"). Then, Selfishness (*SELFISH*) is the answer to the following survey question: "Does the following statement hold true for you?" and "I don't sit in a priority seat on public transportation because I want to offer it to others." Again, the response is on a 5-point scale, from 1 ("This is particularly true for me") to 5 ("This is not true for me at all"). Self-control (*SELFCONTROL*) defined by the sum of the following six statements, on a 5-point scale from 1 (not hold true at all) to 5 (particularly true) scales; "Even if I make plans, I end up procrastinating.", "I always keep my promises.", "When I have something I want, I can't bear not to buy it.", "I always plan carefully before making an action.", "No matter how angry I get,

I don't shout at others.”, and “When I am faced with a problem, I usually act before I think.”

4.2 Estimation results for the extended model

Estimation results for the extended model are presented in right column of Table 1. In the column 3, paranormality and non-scientific thinking are negative but insignificant, though this may be due to collinearity. Gender and age give the almost the same impact on income in the column 1. *ABILITY* and *SELFCONTROL* are positive and significant, while *SELFISH* is not significant; this indicates that those who are generally akin to *Homo economicus* tend to achieve higher incomes.

In the column 4, we found paranormality affect happiness positively, and non-scientific thinking negatively. The effects of the other newly-added explanatory variables are almost the same in the income regression. The only difference is that *SELFISH* is now negative and insignificant rather than positive and insignificant. The negative sign of the point estimate is consistent with previous studies on altruism (Konow and Earley 2008, Phelps 2001).

5. Conclusions

Empirical results reveal that non-scientific thinking lowers income, while paranormality does not. Interestingly enough, non-scientific thinking and paranormality affect happiness in opposite directions: the former lowers happiness while the latter raises it. As belief in religion is known to raise happiness (Cohen 2002), belief in paranormality might act similarly to religiosity.

We extended our analysis to investigate the effects of various other characteristics of *Homo economicus*. Higher ability and self-control resulted in higher income and happiness. Selfishness did not have a significant impact. These results, in general, support the idea that *Homo economicus* achieves higher performance than other subspecies of humanity.

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Table 1. Estimation results for happiness equations

	<i>Default model</i>		<i>Extend model</i>	
	<i>INCOME</i>	<i>HAPPINESS</i>	<i>INCOME</i>	<i>HAPPINESS</i>
<i>PARANORMAL</i>	-6.878 [0.192]	0.042 [0.038]**	-1.357 [0.797]	0.056 [0.007]***
<i>NONSCIENTIFIC</i>	-21.744 [0.004]***	-0.168 [0.000]***	-8.593 [0.268]	-0.099 [0.001]***
<i>DMAN</i>	327.185 [0.000]***	-0.368 [0.000]***	330.319 [0.000]***	-0.327 [0.000]***
<i>AGE</i>	31.794 [0.000]***	-0.022 [0.038]**	32.895 [0.000]***	-0.018 [0.096]*
<i>AGE_SQ</i>	-0.328 [0.000]***	0.0002 [0.064]*	-0.343 [0.000]***	0 [0.211]
<i>INCOME</i>		0.001 [0.000]***		0.001 [0.000]***
<i>SELFISH</i>			5.733 [0.202]	-0.025 [0.156]
<i>ABILITY</i>			44.935 [0.000]***	0.142 [0.000]***
<i>SELFCONTROL</i>			4.115 [0.014]**	0.04 [0.000]***
Constant	-560.175 [0.000]***		-819.365 [0.000]***	
R ²	0.005	0.011	0.324	0.02
Obs	3895	3211	3144	3122

Note: Estimation method is OLS for the income regression, and ordered probit for the happiness regression. We show Adjusted R-squared for the income regression, and pseudo R-squared for the happiness regression.