

Perceived Happiness and Self-rated health: The Twins? A Bivariate Ordered Probit Models Analysis using World Value Survey

Ying-Yin Koay* Yoke-Kee Eng Chin-Yoong Wong

Department of Economics, Faculty of Business and Finance, Universiti Tunku Abdul Rahman

* Correspondence author at koayyy@utar.edu.my. Mailing address: Jalan Universiti, Bandar Barat, 31900 Kampar, Perak. Tel no: 605-4688888

Abstract

Studies regarding the resources of happiness have reached a consensus that health is one of the most crucial inputs of individual happiness. Nevertheless, happiness also seems to have influential impact on health. As such, *are happiness and health co-existed? If yes, is the co-existed relationship due to the joint determinants such as socioeconomic status (SES) or because of the endogeneity of happiness to health?* This study aims to reveal the co-existed relationship between happiness and health in Malaysia using subjective indicators from the SES perspective. Based on a sample of 1300 Malaysia respondents from the Wave 6 of World Value Survey (WVS), we first construct a simultaneous system, Bivariate Ordered Probit Models, to investigate the nexus between perceived happiness and self-rated health. Then, we test if the perceived happiness is endogenous to self-rated health by the Likelihood Ratio and Wald test. The results show that perceived happiness and self-rated health are significantly and positively related with each other. This implies that Malaysians' welfare can be earned by providing better health care services and insurances. This cross-sectional empirical study also reveals that money (income) can buy Malaysians' happiness but not their health. Malaysians should strike a balance on their earning life by not overloading themselves as good health is hardly to be earned.

Keywords: Perceived Happiness; Self-rated health; World Value Survey; Bivariate Ordered Probit Models

1. Introduction

Among the resources of happiness, health has globally and statistically been proven as one of the most crucial inputs of individual happiness. In turn, happiness may have influential impact on health especially in the modern life today which it is full of social competitions and thus stress is created. Someone who is happy would be more optimistic in handling their stressful life compared to those who are unhappy, thus the probabilities of getting any diseases that stress related such as depression and hypertension will be lower. In view of this, both happiness and health may influence each other at the same time. Nevertheless, most happiness-health studies have been done with a unidirectional manner, either they emphasize on the influence of health on happiness, or vice versus.

Further investigation is needed to reveal the simultaneous relationship between happiness and health; either the relationship is formed due to the same explanatory variables (such as socioeconomic status), or because of the endogeneity of happiness to health. In order to fill up the research gap, this study intends to study the simultaneous relationship between happiness and health in Malaysia using subjective indicators – perceived happiness and self-rated happiness. Both indicators are obtained based on a single item which are “Taking all things together, would you say you are very happy, rather happy, not very happy or not at all happy.” and “All in all, how would you describe your state of health these days: very good, good fair or poor?”, respectively.

2. Jointly determinants of happiness and health

The socioeconomic status (SES) is a multifaceted social economic variable which is usually constructed by individual education, income and occupation/employment status (Winkleby et al, 1992). Education is one of the most significant factors in predicting happiness and health. The positive relationship between education and happiness may be due to their job securities are more guaranteed and hence the standard of living is more ideal, hence they are happier (Stutzer & Frey, 2008; Diener, 2000). However, Clark and Oswald (1994) obtained a negative relationship between education and wellbeing. They justified their findings by the explanation that educated people would expect higher income; the unmet of the expected income would create disappointment and unhappiness.

Many happiness economists have placed the focus lens on the relationship between income and happiness. It is a norm that higher income can support better life style and thus happiness is more guaranteed. This practice holds in the cross sectional empirical results (Ferrer-i-Carbonell, 2005; Diener et al, 1999) but not in the time series studies (Easterlin, 2001; Frey & Stutzer, 2000). This has been further explained by the adaptation to income where people have used to the high income level and they do not feel happier if the income increases (Di Tella et al, 2010). On the other hand, the studies have shown that the contributions of income have outweighed its costs on health (Fichera & Savage, 2015; Oshio & Kobayashi, 2010). Higher income can afford a higher quality of living such as living at a more peaceful residential area (Subramanian et al, 2005), health care (Cutler & Lleras-Muney, 2006), and balanced nutrition (Lynch et al, 2000).

Unemployment has been found as one of the crucial predictors for both unhappiness and poor health (Pierewan & Tampubolon, 2015). Previous studies have revealed a strong negative relationship between unemployment and happiness (Di Tella et al, 2001). Being unemployed are not just about the loss of income, yet it brings significant non-pecuniary impacts such as the loss of self-esteem, lack of self-confidence, being pessimistic and doubtful on the meaning of life (McKee-Ryan et al, 2005). On the other hand, studies also presented a positive nexus between unemployment and adverse health outcomes (McKee-

Ryan et al, 2005). Unemployment may tighten the financial constraints, depress social status and promote unhealthy behaviours that would put someone in a stressful condition (Luo et al, 2010).

3. Methodology

We are using the Wave 6 of WVS for to reveal the co-existed relationship between perceived happiness and self-report health. Assume the latent variables of perceived happiness (PH) and self-rated health (SH) are PH_i^* and SH_i^* , respectively as such:

$$PH_i^* = X'_{1i}\beta_1 + \varepsilon_{1i} \quad (1)$$

$$SH_i^* = X'_{2i}\beta_2 + \gamma PH_i^* + \varepsilon_{2i} \quad (2)$$

where Equation (1) and (2) are jointly determined, hence, they are recognised as a simultaneous system. β_1 and β_2 are vectors of unknown parameters, γ is an unknown scalar, ε_1 and ε_2 are the error terms, and i shows an individual observation. The regressors in the models fulfill the exogeneity assumption that $E(X'_{1i} \varepsilon_{1i}) = 0$ and $E(X'_{2i} \varepsilon_{2i}) = 0$.

X'_1 is a vector of exogenous variables for estimating the latent variable of perceived happiness, which include socioeconomic status which are education (*education*), income (*income*) and employment status which has been categories into full-time (*fulltime*), part-time (*partime*) and self-employed (*sememployed*). Additionally, the model also includes the needs for basic needs (*basic*), safety (*safety*), belongingness (*belongingness*) and self-esteem (*selfesteem*), financial satisfaction (*FS*), life satisfaction (*life*) where they are served as instrumental variable to avoid the problem of exogeneity. Furthermore, they are assumed not to correlate with the self-reported health. Lastly, we also consider age (*age*) and gender (*gender*). X'_2 is a vector of exogenous variables for estimating the latent variable of self-rated health. They are income, education, employment status, age and gender to avoid the identification problem of bivariate ordered probit modelling where at least one element of X'_1 should not be presented in X'_2 . After the exogenous variables are chosen, Equations (1) and (2) will be jointly determined by Bivariate Ordered modelling.

Equations (1) and (2) will be estimated by the method of full-information maximum likelihood. Compared to the two-steps estimation, FIML has statistically been proven to be more efficient and unbiased if (i) the error terms are bivariate normally distributed, (ii) the absolute value of endogenous dummy coefficient, $|\rho|$, is high or (iii) the sample size is small (Sajaia, 2008). If the $\rho = 0$, PH_i and ε_{2i} are uncorrelated and PH_i is exogenous for Equation (2). In contrast, $\rho \neq 0$ implies that PH_i is correlated with ε_{2i} and hence endogenous. Thus, we use the likelihood ratio test and Wald test to examine the exogeneity in the bivariate (perceived happiness and self-rated health) ordered probit model. If the likelihood ratio / Wald test is greater than the critical values, we reject the null hypothesis that $\rho \neq 0$. Hence, we should regress Equations (1) and (2) simultaneously with bivariate ordered probit specification. In contrast, if the rejection of null

hypothesis is failed, we should regress the two equations separately as univariate ordered probit specification. In order to show the robustness results, this study also analyze the data with the seemingly unrelated bivariate ordered probit with robust standard error models and ordered probit models as shown in the Table 1.

4. Results

Table 1 shows the statistical results of this study. Among the specifications, the simultaneous bivariate ordered probit models are the most appropriate in explaining the linkage between perceived happiness and self-rated health in Malaysia. The likelihood ratio (LR) test shows a simultaneous relationship between happiness and health where happiness is endogeneity to the health model at 1% significance level. The results from this simultaneous system display that among the socioeconomic status, only income (but not education and employment status) significantly influence both perceived happiness and self-rated health. However, income positively influences happiness while it negatively related to health at 5% significance level. This implies that income can motivate happiness while it diminishes health.

Besides income, the fulfillment of basic, safety and belongingness needs, financial satisfaction and life satisfaction can contribute to the improvement of Malaysians' happiness at 1% significance level. However, the need of self-esteem is negatively related to happiness at 1% significance level while the likelihood of being happy makes no difference across the age and gender. On the other hand, age and gender do significantly influence the likelihood of obtaining higher self-rated health at 1% significance level. The elderly Malaysians would rate their health poorer than those younger due to their degeneration of physical functions. Additionally, females perceived themselves healthier than males in terms of their healthiness in physical, mental and lifestyle.

5. Conclusion

From the statistical results, we can conclude that Malaysians' happiness and health are positively related to each other simultaneously not because of having the same determinants. This may provide some insights to the Government and policy makers that regardless wellbeing policies or health policies, each of them can help to improve both happiness and health benefits for Malaysians. As such, the Government may consider providing the health insurance or medical card for those who are from low-income groups. This cross-sectional empirical study also reveals that money (income) can buy Malaysians' happiness but not their health. Malaysians should strike a balance on their earning life by not over-loading themselves as good health is hardly to be earned.

Table 1: Results of the relationship between perceived happiness and self-rated health from different models

	Simultaneous bivariate ordered Probit	Seemingly unrelated bivariate ordered probit with robust standard error	Ordered probit
PH			
<i>income</i>	0.4941**	0.0731***	0.0578***
<i>education</i>	-0.0335*	-0.0325	-0.0360*
<i>fulltime</i>	0.0401	0.0393	0.0713
<i>parttime</i>	0.0297	0.0057	0.0703
<i>employed</i>	0.0572	0.0619	0.0645
<i>basic</i>	0.1147***	0.0913***	0.0992***
<i>safety</i>	0.1664***	0.1402***	0.1509***
<i>belongingness</i>	0.1762***	0.1488***	0.1596***
<i>selfesteem</i>	-0.2182***	-0.2027***	-0.2192***
<i>FS</i>	0.1116***	0.0708***	0.0755***
<i>life</i>	0.1276***	0.1058***	0.1130***
<i>age</i>	-0.0029	-0.0024	0.0047
<i>gender</i>	-0.0583	-0.0578	-0.1037
<i>SH</i>			0.5538***
SH			
<i>income</i>	-0.0469**	0.0554***	0.0093
<i>education</i>	0.0260	0.0014	0.0131
<i>fulltime</i>	-0.0945	-0.1026	-0.1011
<i>parttime</i>	-0.1959	-0.2023	-0.2145
<i>employed</i>	-0.0224	-0.0041	-0.0118
<i>age</i>	-0.0204***	-0.0205***	-0.0213***
<i>gender</i>	0.1903***	0.1337**	0.1670**
<i>PH</i>			0.7485***
Athrho_cons	-0.3176***	0.4308***	
Gamma_cons	0.7175***		
rho	-0.3073	0.4060	
LR test	111.39***		13.90 (for PH model) 39.04***(for SH model)
Wald test		96.78***	

Notes:

The asterisk (*) represents the significant level: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.10$.

LR test in the simultaneous bivariate ordered probit models is used to show the endogeneity of happiness to health at 1% significance level.

LR test in the PH ordered probit model indicates that the model fulfill the equality assumption of coefficients across response categories while SH ordered probit does not fulfill such assumption.

Wald test displays that the PH and SH models should be regressed simultaneously.

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