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Testing the Existence of Hedonic Adaptation and Inertia to Income with implications for Islamic economics: a case of Pakistan

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Abstract:

The fact that happiness does not increase as income increases (Easterlin Paradox) has puzzled a number of scholars for a number of decades. The latest research on this topic concludes that happiness increases with an increment in income in the short term but it adapts to this income increment in the long term. What is the Islamic economics explanation for hedonic adaptation to income? It is argued that Islamic economics should predict a non-existence of hedonic adaptation to income for a society completely following Islamic code of life since it, fully or partially, delinks happiness from income. Testing the existence of hedonic adaptation to income is, therefore, an indirect way to assess whether a society pursuing a materialistic goals or following a life enjoined in Qur'an and the Sunnah of the Holy Prophet Mohammad (peace be upon him).

The first objective of this research is to test whether happiness adapts to income increase in the short run using two-period panel survey in Pakistan.

The second objective is to formulate happiness function by incorporating dimensions of zakat and remembrance of Allah (zikr) to highlight possibility of sustain happiness without adaptation to income in the light of Islamic teachings.

The paper applies Random Effect Ordered Probit model to investigate the hedonic adaptation effect using various formulations used in the happiness literature.

The results show that there is no adaptation to income in Pakistan given the time period. The result is consistent with the studies that show no adaptation during a short period. However, the models used here are not controlled for zakat and zikr due to data unavailability. Hence, Islamic economics implications are derived only theoretically.

The significance of the present research lies in the fact that it is the first study in Pakistan that tests the hedonic adaptation to income and hence contributes to the evidence on happiness dynamics. Moreover, it is also the first study that formulates a happiness function from Islamic perspective and highlights happiness dimension of zakat. These are important contributions in Islamic economics literature.

Key words: happiness, adaptation, income, zakat.

1. Introduction

One of the explanations to the Easterlin Paradox (1974) is that people adapt their happiness to income over time and this explanation is termed as hedonic adaptation or hedonic treadmill in the literature (Brickman and Campbell, 1971). For a brief literature review on hedonic adaptation, see for example, Bottan and Truglia (2011) and Di Tella et al (2010). Diener et al (2006) propose five revisions in the original treadmill model. These revisions are, to wit: non-neutral set points¹, individual set points, multiple set points, and individual differences in adaptation. These revisions allow us to explain incomplete or non-adaptation in the data. The following section presents a variety of formulations discussed in the literature that allow for hedonic adaptation to income². After the brief discussion of these formulations, the Islamic economics explanation of non-adaptation is presented and modelled.

2. Hedonic Adaptation Models: A Brief Literature Review

Many formulations are proposed in the literature to study hedonic adaptation. Based on empirical findings, Layard (2006) proposes the following happiness function with a negative effect of the lagged income to allow for adaptation:

$$U_{it} = U(y_{it} - \beta y_{it-1}, h) \quad (1)$$

where U_{it} is the happiness of the i th individual at time t , y_{it} is the real household income of the i th individual at time t , y_{it-1} is one period lag of real household income of the i th individual at time $t-1$, and h is number of hours of work.

Another formulation considered in Layard (2006) is to allow for loss-aversion³:

$$U_{it} = U[(1 - \beta)y_{it} + \beta\Delta y_{it}, h] \quad (2)$$

Based on Layard's explanation, loss-aversion can be defined as:

$$\Delta U_{it} |_{\Delta y_{it} < 0} \gg \Delta U_{it} |_{\Delta y_{it} > 0} \quad (3)$$

That is, the effect of a unit change in income on happiness is greater when income falls than when income rises. The asymmetry of happiness response to changes in income is an important finding attributed to Kahneman and his colleagues, and has many important policy implications.

¹ The set point is a term in psychology for a genetically determined hedonic or happiness point to which a person converges after a positive or negative shock.

² A distinction is made between hedonic and eudemonic approaches to happiness in psychology. The former relates to pleasure as a stand alone concept where as the latter not only considers happiness but also the sources and processes that lead to happiness.

³ The asymmetry of income comparison by higher income group and lower income group is termed as loss aversion by Kahneman and Tversky (1979) in their prospect theory.

Somewhat similar to model in (1), Clark et al (2006) considers the following formulation with current real income and change in real income:⁴

$$U_{it} = \beta_1 \ln(y_{it}) + \beta_2 \ln(y_{it}/y_{it-1}) + \gamma Z_{it} \quad (4)$$

where Z indicates demographic variables.

Ferrer-i-Carbonell and Van Praag (2008) consider many modifications of the following general specification:⁵

$$U_{it} - U_{it-1} = \beta(y_{it} - y_{it-1}) + \delta Z_{it} + \gamma(Z_{it} - Z_{it-1}) \quad (5)$$

To allow for loss-aversion, for instance, they consider the following specification:

$$U_{it} - U_{it-1} = \beta_1 \Delta y_{it}^+ + \beta_2 \Delta y_{it}^- + \delta Z_{it} + \gamma(Z_{it} - Z_{it-1}) \quad (6)$$

$$\text{Where } \Delta y_{it}^+ \text{ for } \Delta U_{it} |_{\Delta y_{it} > 0} \text{ and } \Delta y_{it}^- \text{ for } \Delta U_{it} |_{\Delta y_{it} < 0} \quad (7)$$

Bottan and Truglia (2011) test whether happiness is autoregressive and use models similar to the following formulation:

$$U_{it} = \alpha U_{it-1} + \beta_1 \ln y_{it} + \beta_2 \ln y_{it-1} + \gamma_1 Z_{it} + \gamma_2 Z_{it-1} \quad (8)$$

Where a positive coefficient of lagged happiness variable would show that happiness is inertial.

The following section attempts to formulate the possibility of non-adaptation to income from Islamic economics perspective.

3. Model Formulation in Islamic Perspective

The above formulations may be modified to include happiness implication for *zakat* giver and *zakat* receiver along with remembrance of Allah (*zikr*). The straightforward implication for *zakat* receiver is that *zakat* increases their happiness level. That is the reason that Muslims are ordered to pay *Zakat ul Fitr* before going for *Eid ul Fitr* prayer in order to share their happiness with the poor. The *Qur'an* and the *Sunnah* have emphasised the giving of *zakat* and *saddaqa* for the benefit of the poor and the needy in a society because they not only fulfil their material needs but also increase their happiness level.

The benefits of *zakat* mentioned in Islamic economics literature confined largely to fulfilling the needs of the poor, providing social security, reducing poverty and income inequality, and increasing the purchasing power of the poor (see, for example, Chapra, 1992; Khan, 1994). The happiness dimension of *zakat* has been largely ignored in Islamic economics literature. As far as *zakat* giver is concerned, a number studies show that giving in

⁴ This is not the exact specification used in Clark et al (2006). I have modified it to suit for a two-period panel.

⁵ The original specification given in Ferrer-i-Carbonell and Van Praag (2008) is for more than two time periods.

charity increases happiness or self-satisfaction of the giver (Liu, et. al., 2008, Dunn, et. al. 2008). Therefore, there would be a two-fold increase in happiness if the *zakat* system is implemented in true letter and spirit in terms of *zakat* collection and disbursement.

The adaptation of happiness to income in long term is due, likely, to rising aspirations with income increase. This could be avoided by adopting means and ways in life that lead to contentment. A contented heart does not need money for happiness. The money (wealth) and happiness (satisfaction) are blessings of Allah. These blessings may come together as mentioned in the Qur'an:

“That is He Who give wealth and satisfaction”. (Surah 53, Verse 48)

The main source of contentment and satisfaction, as mentioned in the *Qur'an*, is remembrance of *Allah*:

“Those who believe, and whose hearts find satisfaction in the remembrance of *Allah*, Verily, in the remembrance of *Allah* do hearts find satisfaction”. (Surah 13, Verse 28)

In another surah, *Allah* emphasizes His remembrance:

“O you who believe! Remember *Allah*, with much remembrance”.

(Surah 33, Verse 41)

The following *hadith* of the Holy Prophet (SAW) indicates the significance of remembrance of *Allah*:

Narrated Abu Musa (RA): The Prophet (SAW) said,

“The example of the one who remembers his Lord (*Allah*) in comparison to the one who does not remember his Lord (*Allah*), is that of a living creature compared to a dead one”. (Sahih Al-Bukhari, Vol. 8, Hadith No. 416)

The satisfaction of human beings lies in the remembrance of Allah. This is the divine remedy for dissatisfaction and unhappiness by the Creator of all mankind Who knows best about His creation.

Contentment of heart by remembrance of Allah is a great blessing of Allah and provides a sustain happiness in the long-term against the prediction of Easterlin (2010) study. Thus, Islamic economics theoretically predicts hedonic non-adaptation to income for a society completely adheres to Islamic codes of life (an ideal Islamic society). Those who sought wealth to obtain satisfaction might not fulfil their hope since both come from Allah independently and not interlinked.

Although adaptation to income is a behavioural trait like greed, selfishness, desire to accumulate wealth, etc. yet the objective of Islamic teachings is to upgrade behavioural character to highest moral standards that please Allah and His Prophet. The conventional economics assumes those behavioural instincts observed in human nature as foundations of economics particularly neo-classical economics though most of these have been proven

wrong, for example the assumption of self-interest, by experimental research. In contrast, Islamic economics sets morality at the highest standard as a goal and ideal for a society and build its foundation on desirable behavioural characteristics. The model building in Islamic economics should, therefore, show dynamics of attainment to desired characteristics.

On the basis of foregoing discussion, following specification is proposed by making modification in Layard (2006) happiness function given in equation (1) to incorporate spiritual orientation and religious obligations in Islamic perspective by introducing ethical parameter and variables:

$$U_{it} = U((1-\lambda)(y_{it} - \beta y_{it-1}), h, \lambda RA, \lambda(\delta Z^r + (1-\delta)Z^g)) \quad (9)$$

where λ = degree of adherence to Shariah ($0 \leq \lambda \leq 1$)

RA = remembrance (zikr) of Allah

Z^r = zakat receiver

Z^g = zakat giver

$\delta = 1$ for zakat receiver

$\delta = 0$ for zakat giver

A happiness function in Islamic perspective is given in equation (9)⁶. It is equivalent to happiness function given in equation (1) if degree of adherence to Shariah is zero implying no zikr and no receipt/payment of zakat. As the degree of adherence to Shariah increased to 100% then the link between happiness and income will break down complying with verse 48 surah 53:

“That is He Who give wealth and satisfaction”.

The above verse does not imply satisfaction with wealth but implies an independence of satisfaction from wealth. Hence, happiness becomes a function of zikr, and zakat (charity) in an ideal state:

$$U_{it} = U(h, RA, Z^k) \text{ where } k = r \text{ or } g \quad (10)$$

The impact of remembrance of Allah and receiving/giving zakat on happiness increases with higher degree of adherence to Shariah. The proposed happiness function may be used to test hedonic adaptation to income given the degree of adherence to Shariah.

4. Model Estimation

For an ideal state, the model in (9) can be estimated for testing the likely statistical insignificance of income terms. But the proposed model in (9) cannot be estimated due to

⁶ The model seems to be very simplistic but that is how research in economics develops. The Keynesian consumption function and neo-classical utility function, among others, are examples of such approach.

unavailability of data on zakat receipt and payment (Z^k) and on suitable proxy for zikr (RA) in Pakistan Socio-Economic Survey (PSES). However, the models (1-8) are estimated, without controlling for zakat and zikr, using two period panel data from the PSES phase 1 and phase 2.

The life happiness question is not available in phase 1. However, there is a question in phase 2 asking about happiness relative to the past. That question is used to make a surrogate for life happiness question in phase 1. The estimation is run using the sample common in both phases. Since the happiness question has only three categories, it is considered ordinal and an ordered probit panel model is used for estimation. The unobservable individual traits are considered random and assumed to be uncorrelated with included variables in the model. These assumptions are plausible since there is very high heterogeneity in individuals' responses, and hence a random effects model is preferred to the fixed effects model. The theoretical formulation (Crouchley's formulation) of ordered choice models with random effects for panel data are given below (Greene and Hensher, 2008):

$$U_{it}^* = \beta' y_{it} + u_i + \varepsilon_{it}$$

$$U_{it} = j \quad \text{if} \quad \mu_{j-1} \leq U_{it}^* < \mu_j$$

U_{it}^* is an unobserved (latent) variable,

U_{it} is a manifested variable equal to the j th category,

y_{it} is a vector of explanatory variables,

$\varepsilon_{it} \sim N(0,1)$, stochastic error term,

$u_i \sim N(0, \sigma^2)$, random effect term independent of ε_{it} for all t , and

μ 's are cut-off points for each category.

The parameters β 's and the cut-off points are estimated using maximum likelihood.

5. Results and Discussions⁷

Table 1 summarizes the results of the random effects ordered probit models. The coefficient on lag income is negative but statistically insignificant in model 1. Economic criterion suggests that there is an evidence of adaptation to income but statistical criterion does not endorse that conclusion. Hence current happiness depends only on current income and is not affected by the previous level of income. However, the statistical insignificance does not mean an ideal state as required in (10) since it is not control for zikr and zakat.

⁷ All estimations are done by NLOGIT 4.0 (LIMDEP 9.0) econometric software developed by William Greene.

The coefficient for first-order difference of nominal household income is positive and significant in model 2. This indicates a positive effect of income changes on happiness. It may indicate adaptation to income if we restrict coefficients of current and lagged incomes to be the same.

Model 3 and model 4 show similar results to the above models but with real income.

The coefficients for current and first-order difference incomes are positive but insignificant in model 5. Moreover, the log likelihood is flat at the estimates.

The dependent variable is change in happiness in model 6 and the coefficient of first-order difference real income is positive and significant but log likelihood is flat at current estimates. This shows that change in income has a positive effect on change in happiness.

The coefficient for current income is positive and significant, the coefficient of lagged income is negative but insignificant, and the coefficient of lagged happiness is positive and significant but the log likelihood is flat at current estimates in model 7. The positive coefficient of lagged happiness would indicate inertia in happiness. Since the time periods are two years apart and it might be the case that the gap is too long so that happiness dissipates over this interval to its previous level and hence shows inertia. If that is the case it would indicate an adaptation effect. The other extreme case is also possible – the gap is too short – and the happiness would take time to adjust to its previous level after the passage of a long time, and hence would depict real inertia.

The coefficient of differenced real income is positive and significant, and the coefficient of lagged happiness is positive and significant in model 8. It has the same interpretation as model 7.

Table 1: Random Effects Ordered Probit Models

Model Number	Probability Index Function (Correct prediction)	Remarks
Model 1	39.96%	No adaptation effect
Constant	-.24624842	
GENDER	-.05327971	
AGE	.00127252	
EDU	.00404028*	

UR	.05011964	
LNNY	.05924241	
LAGLNNY	-.01630208	
<hr/>		
Model 2	39%	No adaptation effect
Constant	.21565893	
GENDER	-.05533392	
AGE	.00128470	
EDU	.00474809	
UR	.06995613	
DLNNY	.03779831	
<hr/>		
Model 3	39.5%	No adaptation effect
Constant	.00525406	
GENDER	-.05387937	
AGE	.00128347	
EDU	.00423288*	
UR	.05478879*	
LNRY	.05416031	
LAGLNRY	-.02147177	
<hr/>		
Model 4	39.3%	No adaptation effect
Constant	.21566188	
GENDER	-.05533209	
AGE	.00128464	
EDU	.00474778	
UR	.06995819	
DLNRY	.03783129	
<hr/>		
Model 5	39.5%	No adaptation effect

Constant	.00525420	
GENDER	-.05387935	
AGE	.00128347	
EDU	.00423288*	
UR	.05478879*	
LNRY	.03268851	
DLNRY	.02147178	
Model 6	10%	No adaptation effect
DLNRY	.06460951	
Model 7	36.3%	Inertia
LNRY	.05134365	
LAGLNRY	-.02478057	
LAGHAPP	.09698894	
Model 8	35.6%	Inertia
DLNRY	.04010989	
LAGHAPP	.19844387	

Note: Coefficients highlighted in bold are insignificant, those marked by a * significant at 10%, and all other significant at 5%.

A comparison of the eight models, estimated above, is made on the basis of percentage of correct predictions. All models show correct predictions in the range of 35 % to 40% except model 6 with only 10% correct predictions. These models may provide a weak evidence for hedonic adaptation to income, although inconsistent with the findings on long panels like German Socio-Economic Panel (GSOEP) and British Household Panel Survey (BHPS), is yet consistent with most of the findings in the literature (see, Clark et al 2006 for a review of this evidence). Easterlin et. al (2010) attempts to resolve the paradox. The study finds that happiness and income are directly related in the short term but they are not related in the long term (for a period of more than 10 years). Since present study uses a very short panel, it confirms Easterlin et. al (2010) findings. However, the findings in the present study

should be taken with caution since the panel is relatively short and the happiness in phase 1 is measured with a surrogate. The evidence of inertia in some models remains inconclusive unless supported by evidence from a longer panel. These results cannot be interpreted in terms of predictions of Islamic economics due to missing relevant variables.

An economic policy implication of this result is that policy makers should ensure increment in income after regular intervals and take steps to minimize unemployment and to control inflation (unemployment reduces nominal income, on average, whereas inflation diminishes real income) since both have negative impact on happiness as confirmed by many studies (see, for example, Gandelman and Murillo, 2009; Di Tella and MacCulloch, 2001, 2006, 2008; Frey and Stutzer, 2002; Di Tella, MacCulloch, and Oswald, 2001, 2003; Wolfers, 2001; Oswald, 1997; Clark and Oswald, 1994).

6. Conclusion

Adaptation implies that the marginal utility (MU) of income is diminishing over time. This means the negative impact of zakah, if there is any, disappears over time. Assuming the instantaneous MU of money is diminishing as well, redistribution through taxes or zakah should result in welfare improvement around the time of distribution. Average happiness will therefore increase. What distinguishes Islam's system of redistribution is the fact that Islam gives religious sanctity to the payment of zakah and promises a "return" in the hereafter at least. This associates positive utility with zakah which may offset, partly or fully, the disutility from giving. One would therefore expect zakah to be more welfare improving than taxes and the difference is expected to increase with the degree of religious association/adherence. Zikr (in a broader sense of including religious activity including obligatory prayers) could be positively associated with the degree of religious association. We also expect the degree of religious association to weaken the link between happiness and income. This further decreases the negative impact of zakah and increases the positive impact associated with giving. Religious association therefore is overall a Pareto improvement. The degree of Shariah compliance of Islamic investment modes is, therefore, has similar effect on happiness via religious association parameter.

The predictions above may be tested only when suitable data are available. The availability of panel data on zakat is very important to test the model. Similarly, good proxy data on zikr are required for estimating the model. A latent variable may be created from various indicators of zikr like offering obligatory prayers, performing Umrah and Hajj, etc.

It is also worthwhile to test whether giving zakat or receiving zakat creates more happiness in line with loss-aversion discussed above. i.e.

$$\Delta U_{it} |_{z^g} \gg \Delta U_{it} |_{z^r} \quad (11)$$

Similarly, we can test whether positive impact of zakat giving on happiness dominates negative impact of zakat giving with the increase in degree of adherence to Sharia.i.e.,

$$\Delta U_{it}^+ |_{z^g, \lambda \rightarrow 1} \gg \Delta U_{it}^- |_{z^g, \lambda \rightarrow 0} \quad (12)$$

There are many other possible directions for future work. Some of them are given below:

An analysis of income shocks could be done given that the required data are available. We would expect zakat-payers to be blessed more than non-payers which can be summarized in testing the following hypothesis

1. Positive income shocks to zakat payers are larger in size as compared to non-payers (conditioned on non-receivers)
2. Negative income shocks to zakat payers are lower in size as compared to non-payers (conditions on non-receivers)
3. The impact of positive income shocks on happiness for zakat payers is greater than non-payers (conditioned on non-receivers).
4. The impact of negative income shocks on happiness for zakat payers is smaller than non-payers (conditioned on non-receivers).

Testing the above and similar hypotheses would lead to an empirical foundation of Islamic economics in the area of happiness and economics of zakat.

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