Macroeconomic Determinants of the Happiness of the Poor: A Case Study of Pakistan

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Abstract

There is not much research on welfare-economics from the perspective of human wellbeing (happiness). The main reason is that this is qualitative and subjective phenomena are not easily captured by measurement. In the present endeavour, we tried to capture it (happiness) from the opposite side of the poverty index. We employed the modified ARDL technique for long-run friendship between the happiness of the poor and some macroeconomic influencing factors; short-run dynamic behaviour is scrutinised through ECM.

The findings about the happiness of the poor and its determinants show that the happiness of poor individuals is highly influenced by macroeconomics shocks prevailing in the economy. Economic growth or a rise in GDP per capita decreases the level of the happiness of the poor due to an upper-echelon phenomenon over a long span of time in Pakistan. Inflation influences the purchasing power of poor segments of population and definitely affects the happiness negatively for both the long-term and short-term. Enhancement in remittances seems to push happiness or welfare levels of the poor upward significantly. Increases in indirect taxes, especially sales taxes, are associated with low levels of happiness of poor individuals in a small developing economy like Pakistan. Trade-openness improves happiness rankings of poor segments of the population through direct and indirect channels. Finally, a low level of happiness is associated with low urbanisation over a short period of time.

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Introduction

The debate on whether it is population that increases poverty or population accompanied by a lack of education and civic amenities to justify a poor person's status, still needs to be resolved along with policies to be formulated at the national level. But all this leads us to another query as to whether the efforts put forth by governments in raising the level of GNP/GDP is really translating into the wellbeing of an individual and enhancing the level of human development. Several studies find that happiness has some linkages to future economic success (Pollak, 1970; Easterlin, 1974; Veenhoven, 1993; Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998 and, Diener and Biswas-Diener, 1999). The reality is that life opportunities for a number of people are expanding. Unfortunately, at the same time there are a large number of people who are still caught in the vicious circle of poverty and misery, ill health and lack of opportunities. Richard Easterlin (1974) was the first economist to make prominent use of happiness data when he reported that despite increases in personal income over time, people were not reporting an increasing level of happiness. The pattern of economic growth without increase in happiness would result also if people became accustomed over time to increases in income, as in the model of Pollak (1970). In Japan, income rose by a multiple of five between 1958 and 1987, and happiness remained stationary (Veenhoven, 1993).

Happiness seems to be based on relative income rather than absolute income and even adapts to changes in the level of income. Sometimes differences in happiness arise depending on which cohort or which ethnic group is followed over time (Blanchflower and Oswald, 2000 and 2004). There appears to be transitory income effects that do not often translate into permanently different levels of happiness. Di Tella, MacCulloch and Oswald (2003) presented results which were consistent with adaptation to income over time. Thus, while analysing growth patterns for determining the level of wellbeing and happiness one should be very clear how a person's current income should enter the utility function. In this connection, Easterlin (1974) explained "Happiness scores carry no meaning, they are not comparable

across people, people redefine their happiness scores over time; happiness should depend on health, environment, leisure and variables other than income." Happiness is more a qualitative and subjective matter; nevertheless, it is not absolutely impossible to translate it into quantitative terms. No doubt, it keeps on changing with time and perception. Luttmer (2004) has also mentioned that what people mean by 'happiness' might shift over time. Infact, he uses measures of wellbeing like the incidence of depression, poor appetite and poor sleep that are less likely to be purely subjective and finds similar results as those obtained using standard subjective happiness data. Easterlin (2004) suggests that there is complete adaptation to income but incomplete adaptation to life's events like marriage or disability. Being married has significant and positive effects on satisfaction with one's economic situation, although these effects are much stronger on happiness. In this context of social dimensions, Brickman, Coates and Janoff-Bullman (1978) argued that individuals who had become paraplegic or quadriplegic within the previous year reported only slightly lower levels of life satisfaction than healthy individuals.

Regarding the variables associated with true utility like the levels of employment and unemployment, cross-sectional and panel studies reveal that unemployed individuals tend to report low happiness scores (Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998). This outcome seems reasonable given that other odds like divorce, addiction, depression and violence are correlated with unemployment. But, at the same time, the comparison is also valid regarding the effects on the happiness of workers who lose their safety net with the gains they accrue on account of a lower rate of unemployment. Sometimes the rate of unemployment decreases when unemployment benefits fall. Di Tella, MacCulloch and Oswald (2003) show that in Europe, the happiness gap between employed and unemployed did not narrow with the increase in benefits during the period from 1975 to 1992. When unemployed people start taking up jobs because of lower level of benefits then they automatically become better off. On the contrary, in this scenario, it is difficult to pass judgment on the level of welfare. This is because the remaining unemployed receive a lower level of welfare on account of the reduction in the level of

benefits. Similarly, some of the unemployed get their welfare increases because the average duration of their unemployment spell declines. According to Di Tella, Haisken-de-New and MacCulloch (2005) there is a strong adaptation to income but no adaptation to job status. A natural explanation behind adaptation is that people adjust their desires – a phenomenon sometimes called 'preference drifts' (van Praag and Kapteyn, 1973).

Considering the situation of transition economies, Blanchflower and Oswald (1997) explain the effects of unemployment on happiness and find that the strong negative effect in a number of Western countries carries over also to transition countries. They conclude that the magnitude of reduction of the reported wellbeing caused by unemployment is similar in Eastern and Western Europe. Analysing more the transition economies, Rose and Carnaghan (1995) suggest that more educated people in transition economies are less likely to approve of the command economy; on the other hand, the collapse of output in traditional industries in the early stages of transition may leave many highly educated people very frustrated, as skills acquired under the old system are now obsolete. In the early years of a radically changing economy where survival is at stake, returns to education are likely to be small and formal education may be of limited use in terms of making a basic living. Veenhoven (1996) points out that there is usually a high positive correlation between satisfaction and education in low-income countries.

As discussed earlier, an individual's happiness or utility is not just a function of income at a point in time, as in the standard model most often used by economists, but that happiness adapts to changes in income over time and that at a point in time, happiness also comes from relative levels of income. In reality, there is a very complex link between macroeconomic policies and individual's life satisfaction or happiness. The reason behind this phenomenon is the strong influence of demographic and other micro-level variables. The entire concept of human development requires closely integrated policies at various levels of the socio-economic system. Just throwing money at the problem cannot give happiness. There are people who give weight to some of the social aspects of life like health, environment, and leisure; if these

variables are negatively correlated with GDP per capita then increased GDP might result in an unchanging level of happiness. This makes a strong case for replacing GDP per capita with other measures of welfare.

Veenhoven (1996) notes that, in Western countries the number of happy people exceeds the number of unhappy people by about three to one, the reverse pattern is observed in third-world countries, particularly when many people live at a subsistence level. Easterlin (1974) argued that there is little relation between income and happiness across countries, although within countries rich people are consistently happier than the poor. The explanation for this, according to Easterlin, is that it is relative, rather than absolute income or wealth that matters to people. Interestingly, there is some evidence that relative income is also important for individual wellbeing. In particular, those who see themselves as being at the 'poor' end of the spectrum are much more likely to be dissatisfied than the 'rich'. (Clark and Oswald, 1996) finds that job satisfaction is strongly influenced by relative, rather than absolute income. Veenhoven (1996) also notes that the correlation between happiness and income is much stronger in poorer countries. Moreover, in poor countries with higher rates of inflation, poor people tend to show lower levels of wellbeing than rich people as inflation always hurts the people of the lower bracket. Especially in the emerging market economies, macroeconomic trends have quite a significant effect on individuals' life satisfaction. Thus, the process of reforms must stabilise higher levels of inflation.

The trade-openness route is a very important mechanism to enhance the level of happiness of poor individuals in the world because it not only tends to improve income but also provides some additional resources in order to overcome the issue of poverty and hence raise the utility level (Winters, 2000; Nicolas, 2001; and David and Scott, 2005). An admixture of export-promotion and import-substitution policies can help a state manage its poverty better, raising the happiness of poor segments of the population in the society, rather than a solely inward or outward looking policy, since the states that have adopted either of these two (or both) policies have done little to improve the happiness of the poor compared to the other factors. Another

argument in favour of the beneficial effects of trade on raising the happiness level of deprived segments is put forward by Bhagwati and Srinivasan (2002). They point out that if a country wants to maintain an export-led development strategy, that is, if a country wants to rely on free trade, it must maintain a framework of macroeconomic stability. Because stability implies low inflation, it is another channel through which trade positively influences the happiness of the poor, since the satisfaction of the poor tends to be hardest hit by high inflation (Bardhan, 2004).

The present endeavour is unique from all studies on the basis of the fact that it opens new directions in welfare economics in the case of a small developing economy like Pakistan. We utilised the time series data from the 1973—2006 time period and employed advance modified ARDL technique for long-term association of variables and ECM procedure for short-term assocation. The balance of the paper is organised as follows: section B explains the model and data collection procedure, section C describes methodological structure of the study and section D interprets the empirical results. Finally, section D presents conclusion and policy recommendations.

Model and data collection

In light of the above discussion, the algebraic equation for empirical investigation being modelled is the following;

$$LHN = \alpha_{\circ} + \alpha_1 GDP + \alpha_2 LINF + \alpha_3 LTR + \alpha_4 LFDI + \alpha_5 LTAX + \alpha_6 LREM + \alpha_7 LURB + \alpha_8 LME + \eta_t \quad (1)$$

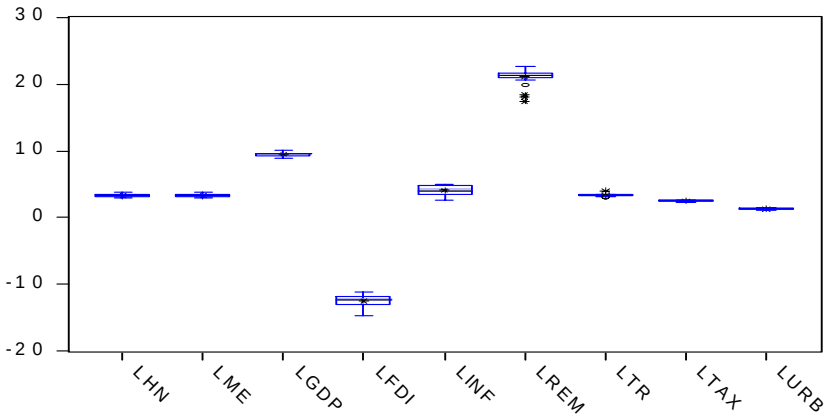
Where:

HP = Happiness Index (Head-count ratio)[1],

[1] Our Happiness Index is based on the assumptions of head-count ratio that is also called poverty index but here there is an inverse relation between poverty and happiness. This indicates that high poverty rate means low happiness because happiness is influenced by the level of satisfaction. The food basket of the poor is with less food items at high levels of poverty, which describes low satisfaction and obviously declines the happiness graph. There is no particular formula to measure this index and we know happiness is a qualitative phenomenon and could not

GDP = Real GDP per capita,
INF = Inflation proxied by CPI,
TR = Trade as share of GDP,
FDI = Foreign Direct Investment,
TAX = Tax revenue as share of GDP
REM **=** Remittance as share of GDP,
URB = Urbanisation as share of total population,
ME = Macroeconomic Shocks

Box-plot Representation



The data period is from 1973 to 2006 and World Development Indicators (WDI), International Financial Statistics (IFS) and Economic Survey of Pakistan (various issues) have been utilised to obtain the data of said actors in the concerned model.

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be easily measured in the literature. Most studies in the literature measured happiness through different kinds of 'dummies'. So we tried to show a Happiness Index from the opposite side of the poverty index. The value of the index ranges from 0—100 (0 means no poverty and high levels of happiness and 100 shows high levels of poverty and zero level of happiness (satisfaction).

Methodological construction

Unit root estimation

In order to scrutinise the integrating level of variable standards, tests are employed like DF-GLS and KPSS. In order to find out the order of integration, ADF (Dicky & Fuller, 1979) and P-P (Philip & Perron, 1988) tests are often used respectively.[2] Due to their poor size and power properties, both tests are not reliable for small sample data sets (Dejong et al, 1992 and Harris, 2003). They conclude that these tests seem to over-reject the null hypotheses when it is true and accept it when it is false. While three newly proposed tests seem to solve this arising problem: the Dicky-Fuller generalised least square (DF-GLS) de-trending test developed by Elliot et al. (1996), and KPSS by Kwiatkowski-Phillips-Schmidt-Shin (1992).

On the assumption that there is a need to test the order of integration of variable X_t, Elliot et al. (1996), enhance the power of ADF test by the de-trending procedure and DF-GLS test is based on null hypothesis $H_\circ : \delta_\circ^* = 0$ in the regression:

$$\Delta X_t^d = \delta^* X_{t-1}^d + \delta_1^* \Delta X_{t-1}^d + ... + \delta_{p-1}^* \Delta X_{t-p+1}^d + \eta_t .....(2)$$

Where X_t^d is the de-trended series and null hypotheses of this test is that X_t has a random walk trend, possibly with drift as follows:

$$X_t^d = X_t - \hat{\varphi}_\circ - \hat{\varphi}_1 t .....(3)$$

Basically, two hypotheses are proposed, (i) X_t is stationary about a linear time trend and (ii) is stationary with a non-zero mean, but with no linear time trend. Considering the alternative hypotheses, the DF-GLS test is performed by first estimating the intercept and trend utilising the generalised least square

[2] We also utilised these two tests but decision is based on Ng-Perron test including two other tests.

technique. This estimation is investigated by generating the following variables:

Subject:

$$\bar{X} = \left[X_t, (1 - \bar{\beta} L) X_2, \ldots\ldots\ldots ., (1 - \bar{\beta} L) X_T \right] \ldots\ldots(4)$$

$$\bar{Y} = \left[X_t, (1 - \bar{\beta} L) Y_2, \ldots\ldots\ldots ..., (1 - \bar{\beta} L) Y_T \right] \ldots\ldots\ldots(5)$$

and

$$Y_t = (1, t)\,\bar{\beta} = 1 + \frac{\bar{\alpha}}{T} \ldots\ldots\ldots\ldots\ldots(6)$$

Where 'T' represents number of observation for X_t and $\bar{\alpha}$ is fixed.[3]

OLS estimation is followed by this equation:

$$\bar{X} = \varphi_{\circ} \bar{Y} + \varphi_1 Y_t + \varepsilon_t \ldots\ldots\ldots(7)$$

and OLS estimators $\bar{\varphi}_{\circ}$ and $\bar{\varphi}_1$ are utilised for the removal of trend from as X_t above. ADF test is employed on the transformed variable by fitting the OLS regression[4]:

$$\Delta X_t^d = \lambda_{\circ} + \rho X_{t-1}^d + \sum_{j=1}^{k} \gamma_j \Delta X_{t-j}^d + \mu_t \ldots\ldots\ldots(8)$$

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[3] The power of envelop curve is one-half at $\bar{\alpha} = -13.7$ when the model has constant and trend term, and at $\bar{\alpha} = -7$ when it has only constant term (see Elliot et al, 1996 for comprehensive study)

[4] For the critical values see (Elliot et al, 1996) of null-hypothesis which is $\rho = 0$.

In alternative hypothesis, $\bar{\alpha} = -7$ in the required equation of $\bar{\beta}$, above, then they calculate $X_t^d = X_t - \varphi_\circ$, fit the ADF regression on new transformed variable and employ the test of the null hypothesis that is $\rho = 0$.

Against the null-hypothesis of ADF, Kwiatkowski, et al, (1992), the test assumes that series to be trend stationary under assumption of null hypothesis. The KPSS statistics are based on the value of residuals gained from OLS regression of Z on explanatory variables W_t:

$$Z_t = \delta W_t + \mu_t \quad \ldots (9)$$

While LM estimation procedure defined as:

$$LM = \sum_t S(t^2)/(T^2 f_\circ) \ldots (10)$$

Where $f_\circ$ is an estimator of the residual term with zero mean and $S(t)$ is a collective residual function such that $S(t) = \sum_{r=1}^{t} \hat{\mu}_r$, based on the residuals.

Modified ARDL bounds testing

We employ the modified autoregressive distributed lag (MARDL) bounds testing approach suggested by Pesaran et al. (2001) as the most appropriate specification to carry out co-integration analysis among happiness of the poor and its determinants. The bounds testing approach has numerous advantages. The main merit lies in the fact that unlike other widely used co-integration techniques, it can be applied irrespective of whether the variables are integrated of order *I(0)* or integrated of order *I(1)*. Fortunately, the modified ARDL method is free of any problem faced by traditional techniques in the literature. Another merit is that it has better small sample properties. Moreover, a dynamic error correction model (ECM) can be derived from modified ARDL through a simple linear transformation (Banerrjee et al. 1993). The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information.

The modified ARDL approach to Co-integration involves estimating the conditional error correction version of the ARDL model as follows:

$$\Delta y = \lambda_1 + \lambda_2 y_{t-1} + \lambda_3 z_{t-1} + \lambda_4 x_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta y_{t-1} + \sum_{j=0}^{p} \alpha_i \Delta x_{t-j} + \sum_{s=0}^{p} w_s \Delta z_{t-s} + \mu_i \text{..(11)}$$

Where $\lambda_\circ$ is the drift component and μ is the assumed to be white noise error processes. The modified ARDL approach estimate $(p+1)^k$ number of regression in order to obtain optimal lag length for each variable, where '*p*' is the maximum number of lags to be used and '*k*' is the number of variable in the equation-11. The optimal lag structure of the first difference regression is selected by the Schwarz-Bayesian criteria (SBC) to ensure an absence of serial correlation in the estimated residual[5]. Following Pesaran et al (2000), two separate statistics are employed to 'bound test' for the existence of a long-run relationship: an F-test for the joint significant of the coefficients of the lagged levels in Eq. (11) (so that null hypothesis $H_\circ : \lambda_2 = \lambda_3 = \lambda_4 = 0$ means no evidence of existence of long-run relationship while alternative hypothesis is $H_1 : \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0$ indicates existence of long-run relationship among variables in the concerned model. Two asymptotic critical value bounds provide a test for co-integration when the independent variables are *I(d)* (Where $0 \leq d \leq 1$): a lower assuming the regressors are *I(0)*, and an upper value assuming purely *I(1)* regressors.

If the F-statistic exceeds the upper critical value, we can conclude that a long-run relationship exists regardless of whether the underlying order of integration of the variables is *I(0)* or *I(1)*. If the F-statistic falls below the lower critical values we cannot reject the null hypothesis of no co-integration. If the F-statistic exceeds the upper bounds, one may reject the hypotheses of no long-run relationship. However, if the F-statistics falls between these two

[5] SBC is known as selecting the smallest lag length to specify a parsimonious model. The mean prediction error of AIC based model is 0.0005 while that of SBC based model is 0.0063 (Min B. Shrestha, 2003).

bounds, inference would be inconclusive. Moreover, when the order of integration of the variable is known and if all the variables are *I(1*), the decision is made based on the upper bound. Similarly, if all the variables are *I(0)*, then the decision is made based on the lower bound.

Then, the long-run relationship is estimated using the selected ARDL model. If variables are co-integrated, the conditional long-run model can then be produced from the reduced from solution of Eq. (11), when the first differenced variables jointly equal to zero, i.e., $\Delta x = \Delta y = \Delta z = 0$. Thus**,**

$$y_t = \partial_\circ + \partial_2 x_t + \partial_3 z_t + \nu_t ...(12)$$

Where $\partial_\circ = -\lambda_1/\lambda_2$; $\partial_2 = -\lambda_3/\lambda_2$; $\partial_3 = -\lambda_4/\lambda_2$, and ν_t are the random errors. These long-run coefficients are estimated by the modified ARDL, model in equation-11 by OLS. When there is long relationship between variables, there exists an error correction representation. Therefore, the error correction model is

$$\Delta y_t = \sum_{i=1}^{p} \lambda_i \Delta y_{t-1} + \sum_{j=1}^{m} \beta_i \Delta x_{t-j} + \sum_{k=1}^{n} \beta_k \Delta z_{t-k} + \eta ECM_{t-1} + \omega_t ...(13)$$

estimated generally as in the following given reduced form:

To ascertain the goodness of fit of the ARDL model, the diagnostic test and the stability test are conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedisticity associated with the model. The stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMsq). Examining the prediction error of the model is another way of ascertaining the reliability of the modified ARDL model. If the error or the difference between the real observation and the forecast is infinitesimal, then the model can be regarded as best fitting.

Interpreting style

Prior to inspecting the order of integration of individual series, DF-GLS (Dicky-Fuller Generalised Least Square) by Elliot et al, (1996) and KPSS (Kwiatkowski, Philips, Schmidt, Shin, 1992) tests have

been employed in the present study.[6] Results of both tests are reported in Table-1; all variables are non-stationary at their level form except TRADE but at 1st difference, all the said variables are stationary. One may conclude that variables are having a mixed order of integration. Results of latter test also prove that all the series are trend stationary. The results in Table-1 show that the majority of variables are *I(1),* although TRADE is integrated at *I(0).* The ambiguities in the order of integration of the variables lend support to the use of the modified ARDL[7] bounds approach rather than one of the alternative co-integration tests. After finding integrating order of all variables, the two-step modified ARDL co-integration (See Pesaran et al., 2001) procedure is implemented in the estimation of equation (1) for Pakistan utilising annual data over the period 1973-2006.

Table-1: Unit root estimation

Variables	DF-GLS Test		KPSS-Test	
	Level	1st Difference	Level	1st Difference
LHN	1.380	-3.235**	0.2340	0.1295***
LME	-2.065	-5.927***	0.2417	0.1183***
LGDPC	-1.824	-4.916*	0.2692	0.0728*
LTRADE	-3.508**	-3.018***	0.0509*	0.0515*
LCPI	-0.674	-2.900***	0.2939	0.1126***
LRIMT	-1.882	-3.616**	0.2325	0.1396**
LFDI	-2.766	-3.236**	0.2747	0.0348*
LURB	-1.845	-3.833*	0.5153	0.0809*
LTAX	-2.525	-7.153*	0.3170	0.0644*

*Note: * (**) *** representing significant at 1% (5%) 10% level of significance.*

In the first stage, the order of lag length on the first differenced estimating the conditional error correction version of the ARDL model for equation 2 is usually obtained from unrestricted vector auto-regression (VAR) by means of Schwartz

[6] The KPSS test may be conducted under the null hypothesis of either trend stationarity (the default) or level stationarity. Inference of this test is complementary to that derived from those based on the Dickey-Fuller. Mostly KPSS test is utilised in conjunction with those tests to scrutinise the possibility that a series is fractionally integrated (neither *I(1)* nor *I(0)*: see Lee and Schmidt(1996).

[7]We just estimated co-integrated vectors in ARDL on the assumption of (Pesaran et al, 2001) and Narayan Perkash (2005) methodological framework.

Bayesian Criteria and Akaike Information Criteria, which is 2 based on the minimum value (AIC) as shown in Table-2. In such small sample of observations we cannot take leg length more than 2 lag orders. The total number of regressions estimated following the modified ARDL method in the equation No.2 is $(2+1)^8=19683$.

Table-2: Lag length criteria

Lag-order	Akaike Information Criterion	Schwarz Criterion	Log Likelihood	Determinant resid covariance
1	- 25.209	- 21.911	475.357	1.73E-23
2	- 30.166	- 23.875	603.585	1.69E-27
Short-run Diagnostic Test-Statistics Serial Correlation LM, F = 0.614 (0.44) ARCH Test = 0.855 (0.85) Normality J-B Value = 4.30 (0.12) Heteroscedisticity Test, F = 0.529 (0.42) Ramsey RESET Test, F =0.835 (0.79)				

The results of the bounds testing approach for co-integration show that the calculated F-statistic is 9.580, which is higher than the upper level of bounds critical values generated by Pesaran et al (2001) and Narayan P (2005). One may conclude that there are seven co-integrating vectors, implying that the null hypothesis of no co-integration cannot be accepted and there is indeed a strong co-integration relationship among the variables in this model. Having found a long-run relationship, we applied the modified ARDL method to estimate the long-run and the short-run elasticity (see Pesaran and Shin, 1999; Pesaran *et al.*, 2001; and Narayan Perkash, 2005 for more details).

The results of happiness contributing factors are given in Table-3, which indicates that the level of happiness of poor segments of the population is highly influenced by macroeconomic shocks because during the macroeconomic shocks, the contribution of growth towards a decline in poverty is slowed down, which further reduces happiness levels of poor individuals in the society.[8] Surprisingly, the co-efficient of economic growth is

[8] As we mentioned that there is an inverse relationship between poverty level and happiness rankings.

proxied by GDP per capita, showing a negative impact on the happiness of the poor. This situation indicates the phenomenon of upper-echelon, where, in Pakistan, income distribution is highly skewed and a very small portion of national income remains for poor segments of the population. This seriously declines the level of happiness of poor households in a small developing economy like Pakistan.

Table-3: ARDL bound testing

Dependent Variable			F-Statistic	
			Lag Order 2	
LHN			9.850	
LME			5.392	
LGDP			7.912	
LINF			9.111	
LTR			29.558	
LREM			11.600	
LTAX			10.897	
LFDI			3.163	
LURB			1.928*	
Critical Value	Pesaran et al (2001) a		Narayan P (2005) b	
	Lower Bound Value	Upper Bound Value	Lower Bound Value	Upper Bound Value
1 % 5 % 10 %	5.15 3.79 3.17	6.36 4.85 4.14	6.140 4.183 3.393	7.607 5.333 4.410

** ARDL estimation shows that there are seven Co-integrating Vectors that is strong indication of long-run relationship among said variables*

[a]Critical values are obtained from Pesaran et al (2001), Table CIII (III): Unrestricted Intercept and no Trend

[b]Critical values are obtained from Narayan (2005), Table CIII (III): Unrestricted Intercept and no Trend, p.1990.

Inflation or monetary instability directly and indirectly reduces the purchasing power of poor personnel in the country through its detrimental channels. Poor segments of the population are more vulnerable to inflationary pressures than the upper class or non-poor. Due to restrictions in financial markets for non-money monetary assets, the poor class holds a greater proportion of their wealth in cash than the rich because inflation erodes

purchasing power along with a decline in happiness or utility from low food. Trade-openness and remittances (international migration) seem to strongly enhance levels of happiness of poor individuals in the country. Trade-openness pushes happiness trends upward through the consumer-surplus channel particularly and the productivity growth side generally or 'learning by doing'. Remittance inflows are a key and stable source of foreign capital, and revenue in developing economies because there is no need to depend on external factors like foreign loans and aid. Through direct and indirect channels, remittances improve the happiness ranks of the poor in the economy.

Table-4: MARDL OLS regression results

Dependent Variable: LHN			
Variable	Co-efficient	t-values	Inst-values
Constant	0.4560	1.719	0.0990
LME	-1.0182	-71.912	0.0000
LGDP(-1)	- 0.0800	-2.736	0.0118
LINF	- 0.0442	-3.680	0.0012
LTR	0.1075	5.544	0.0000
LREM	0.0145	6.258	0.0000
LTAX	- 0.0774	-2.512	0.0194
LFDI	- 0.0048	-1.244	0.2259
LURB	0.0124	0.274	0.7865
R-squared = 0.99914 S.E. of regression =0.0074 Log likelihood = 116.6737 Durbin-Watson stat = 2.167		Adjusted R^2 = 0.99884 Akaike criterion =-6.7296 Schwarz criterion =-6.3173 F-statistic = 3358.883	

Happiness levels are highly influenced by high rates of taxes after GDP per capita in Pakistan. Actually, in tax collection more than 70 percent share of indirect taxes – and in indirect taxes more than 60 percent share of sales taxes – directly retards the purchasing power of poor individuals, reducing the happiness rankings rapidly of the bottom 20 percent of the population in Pakistan. Foreign direct investment is another happiness-declining factor but insignificant. One may conclude that foreign direct investment in Pakistan is mostly going in services and banking sector but not in productive or employment generating activities, bringing up the question as to how the poor can receive benefits from FDI and enhance their utility. Internal migration or

urbanisation is improving happiness level insignificantly. This shows that in Pakistan cities are over-crowded and could not absorb the migrant populations effectively. That is why an increment in the happiness of the poor is low due to stagnated socio-economic activities particularly and political activities generally. Having found a long-run relationship, we applied the modified ARDL method to investigate the long-run, but for short-run dynamical behaviour, we followed the equation-1 and utilised the given model below for short-run dynamics:

$$\Delta LHN = \beta_{\circ} + \sum_{j=0}^{n} \beta_1 \Delta LME + \sum_{J=0}^{n} \beta_2 \Delta LCPI + \sum_{j=0}^{n} \beta_3 \Delta LGDP + \sum_{j=0}^{n} \beta_4 \Delta LFDI$$

$$+ \sum_{j=0}^{n} \beta_5 \Delta LREM + \sum_{j=0}^{n} \beta_6 \Delta LTAX + \sum_{j=0}^{n} \beta_7 \Delta LTR + \sum_{j=0}^{n} \beta_8 \Delta LURB + \eta cet_{t-1} + \varepsilon_t$$

After establishing the long-run relationship between happiness and its determinants in the case of Pakistan as discussed in Table-4, Table-5 reports the short-run coefficient estimates obtained from the ECM version of the modified ARDL model. The ECM coefficient shows how quickly/slowly variables return to equilibrium and it should have a statistically significant coefficient with a negative sign. The error correction term CE_{t-1}, which measures the speed of adjustment to restore equilibrium in the dynamics model, appears with a negative sign and is statistically significant at the one percent level, ensuring that a long-run equilibrium can be attained. Bannerjee et al., (1998) hold that a highly significant error correction term is further proof of the existence of a stable long-run relationship. Indeed, they have argued that testing the significance of CE_{t-1}, which is supposed to carry a negative coefficient, is relatively more efficient way of establishing co-integration.

The coefficient of *CE(-1)* is equal to (-1.40) for the short-run model and implies that deviation from the long-term deviation in the happiness of the poor is corrected by 140 percent over each year at one percent level of significance. The lag length of the short-run model is selected on the basis of Schwartz Bayesian Criteria (SBC).

Results of short-run behaviour in Table-5 are not much different as compared to long-run performance. In short span of time happiness is much declined due to detrimental impacts of

macroeconomic shocks in the country. Inflation and taxes also reduce happiness for a short span of time, while economic growth improves utility level or happiness of poor segments of the population. Trade-openness, remittances and urbanisation enhance the happiness of poor individuals in the country.

Table-5: ECM version of MARDL approach

Dependent Variable: ΔLHN			
Variables	Co-efficient	Std. Error	Inst.value*
Constant	0.0023	0.0033	0.5035
ΔLME	-1.0401	0.0254	0.0000
ΔLINF	-0.1148	0.0379	0.0067
ΔLGDP(-1)	0.0628	0.0305	0.0530
ΔLFDI	-0.00023	0.0022	0.9195
ΔLREM	0.0086	0.0031	0.0106
ΔLTAX	-0.0401	0.0194	0.0519
ΔLTAX(-1)	0.0443	0.0184	0.0255
ΔTR	0.0721	0.0117	0.0000
ΔLURB	0.1377	0.0339	0.0006
ECT(-1)	-1.4081	0.2084	0.0000
R-squared = 0.99036 Adjusted R-squared = 0.98554 Akaike info criterion = -7.31181 Schwarz criterion = -6.80298 Durbin-Watson stat = 1.80616 F-statistic = 205.51			

** Instability. Value means probability value or significance level*

Finally, a short-run model passes short-run diagnostic tests of no-serial correlation and autoregressive conditional heteroscedisticity. There is no heteroscedisticity and the Ramsey test estimation shows that the model is well-specified while error term is normally distributed as shown in Table-2.

Finally, we examine the stability of the long-run parameters together with the short-run movements for the equation. To this end, we rely on cumulative sum (CUSUM) and cumulative sum squares (CUSUMSQ) tests proposed by Borensztein, *et al.* (1995, 1998). The same procedure has been utilised by Pesaran and Pesaran (1997), Suleiman (2005) and Mohsen *et al.* (2002) to test the stability of long-run coefficients**.** The tests applied to the residuals of the ECM model along with the critical bounds are graphed in Figure-1. As can be seen in the figure, the plot of CUSUM stays within the critical 5% bounds for all equations and

the CUSUMsq statistic exceeds the critical boundaries due to mis-specification of the short-run model.

Conclusions and policy recommendations

The findings about the happiness of the poor and its determinants show that the happiness of poor individuals is highly influenced by macroeconomics shocks prevailing in the economy. Economic growth or a rise in GDP per capita decreases the level of the happiness of the poor due to an upper-echelon phenomenon over a long span of time in Pakistan. Inflation influences the purchasing power of poor segments of population and definitely affects the happiness negatively for both the long-term and short-term. Enhancement in remittances seems to push happiness or welfare levels of the poor upward significantly. Increases in indirect taxes, especially sales taxes, are associated with low levels of happiness of poor individuals in a small developing economy like Pakistan. Trade-openness improves happiness rankings of poor segments of the population through direct and indirect channels. Finally, a low level of happiness is associated with low urbanisation over a short period of time.

The present endeavour indicates the need to improve trade-related infrastructure because openness cannot serve as a reliable substitute for a domestic development strategy, especially to lower levels of society. The government should pursue more effective trade liberalisation and trade-stabilisation policies to enhance the wellbeing of the disadvantaged segments of the country. The government should introduce incentives to divert the foreign direct investment to small manufacturing enterprises or cottage-based industries.

There is also need to improve the supply side of the economy to stop the detrimental impacts of macroeconomic shocks to vulnerable groups. In order to bring the issue of poverty reduction to the central stage of economic policy making, what is required is the adoption of a new approach for the allocation of funds to poor actors in the economy. All this needs a realistic assessment of poverty for poverty reduction plans and obviously an increase in the happiness of poor segments of population.

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