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Accounting for its Cross-country Variations Using Dynamic Panel with GMM
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Towards the Development of an Index of Economic Well Being and Accounting for its Cross Country Variations Using Dynamic Panel with GMM Method

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Abstract

This paper develops a composite well being index for 32 developed and developing countries for the period 1990-2016 by taking into account of the limitations of the studies done previously for the development of the index of qualities of life/or well being of the people across the countries in the globe and also the limitation of the use of per capita real GDP as a measure of well being on the basis of the secondary data available from various sources. The composite well being index consists of three separate indexes viz;(i) present well being index;(ii) future / sustainable well being index and finally(iii) the social security index. It also tries to capture the crucial explanatory factors responsible for the dynamics of the cross country heterogeneity of the well being of the people by using dynamic panel data GMM regression technique. We also examine the relationship between the well being and the level as well as growth of the per capita real GDP in a dynamic panel framework.

We find that all our sample countries have experienced increase in the well being of their people in varying degrees over the period 1990-2016. However the rates of increase in the well being of the people in current millennium are much faster than the same during the last decade of the last century. Further we find that the rates of improvement in the present well being index are much higher than those of the future well being and social security index. Interestingly the results of our dynamic panel regression analysis indicate that the technological progress, the globalization, the health capital along with the rule of law as an instrumental variable are the crucial explanatory factors for the dynamics of changes in the well being of the people across our sample countries. We also find that that the growth rates of real per capita GDP across our sample countries do not play any statistically and economically significant role towards the improvement of the aggregate well being of the people across our sample countries.

I. **INTRODUCTION** : It can unequivocally be recognized that the society is a dynamic institution which is undergoing rapid changes, both institutional/ structural, socio-economic and political, either in a forward or backward direction through the interaction between the economic, social and political agents as well as government, through the dynamics of policy initiatives undertaken not only by the Government but also by the economic agents like households, producers as well as the financial institutions. Since the world is a global society, it is also happening at the global level i.e. at the global society incorporating its member countries. Therefore, the major task of the society is to capture the nature of transformation of the societies that is taking place in terms of

change in the quality of life or well being of the people living across the countries in the globe i.e., to quantify the magnitude of transformation of socio-economic indicators governing the changes in the quality of life as well as well being of the people for chalking out the future policies for development and also to examine the trajectories leading to this dynamic process of transformation of the societies and its impact on the people. This can be done either by quantifying the individual socio-economic indicators of quality of life or wellbeing of the society and forming separate indexes in order to unveil the magnitude of changes in the nature of wellbeing of the people or by forming composite indexes for the changes in the quality of life for well being of the people across the countries of the global society. Moreover, it can also be done by undertaking country specific or region specific study towards the development of the quality of life indexes or wellbeing indexes. It has been done and presently it is also being done in several ways by individual Government of the countries, the NGOs and the researchers from time to time.

As an individual researcher our attempt is also in this direction. It is true that wellbeing of people is actually a multidimensional concept. It has different aspects: economic, social, political, environmental, health, education, personal activities like social mobility, freedom; altruism, political voice, governance, social connection and relationship etc. It is also true that all these aspects have undergone initially gradual process of change since 60's and eventually a rapid transformation especially since the process of globalization as well as liberalization has started out since 1990. And this process has also been accelerated since the beginning of the 21st century. Therefore to capture all these aspects of quality of life one has to develop some parameters for constructions of wellbeing indexes. Moreover, it is also necessary to deal with the problem of sustainability of the wellbeing of the people. Actually, the societal form of almost all the countries are presently very different from that of 1960's in the sense that it is post-industrialized, globalised and digitized-computerized-roboticized society. These transformations of societal features have surely many implications for the societal organization of the present century societies and the wellbeing of their members such that it needs an intensive study. Obviously, the study should not only assess the current wellbeing of the

people but also examine the sustainability of the wellbeing over time. Actually, the present wellbeing has to do with not only the economic resources such as income, assets, governance of the society but also with the non-economic aspects of people's life i.e. freedom, natural environment they live in, political situation, social relationship etc.

Now whether these levels of wellbeing can be sustained over time actually depends on the intergenerational transfer of stock of capital and other productive resources. So, we have tried to develop present wellbeing index, the bequest or future well being index as well as social security index separately and then developed composite indexes of wellbeing consisting of the above three items with proper weight for 32 developed, developing countries in the globe. Actually, the basic questions of this paper centered round not only on : (i) "where are we?"; (ii) "where do we want to go?" as are found in other studies (Osberg et. al. ,2002,2016; Porter et. al. (2015); Piketty ,2014; Nussbaum et. al. 1992; Sen 1987; Szalai,1980, Vogel, 1999; Michalos, 2011,2014,2015; Hagerty et.al. 2001; King and Low,2014) but also on " why are we here or at this stage?". In other words, this paper is not only concerned with the development of wellbeing indexes for the said countries but also with the investigation of proximate factors responsible for the cross-country variations in the wellbeing of the people across the sample countries by using dynamic panel regression with GMM method so that it becomes possible to chalk out the policies for bringing about amelioration of the well being of the people through the improvement in all the indicators/parameters considered towards the development of individual as well as composite indexes. We also examine the nature of relationship between the level and growth of per-capita GDP and the individual indices of wellbeing as well as the composite indices through dynamic panel regression so as to find out the role of the level and growth of per-capita GDP and other factors on the improvement of the wellbeing of the people. The rest of this paper is structured as follows. Section II presents a brief review of the previous studies on the measurement of quality of life and well being; section III discusses elaborately the methodology of construction of indexes and the data base; section IV analyses the trend in the composite well being indexes and its components across the sample countries; Section V is devoted to the analysis of the

results of dynamic panel regression and finally, section VI gives the conclusions and policy implications of our study.

II. Review of Past Studies:

It is indeed true that people living in every society want to live or enjoy a good life with entitlement to all kinds of social, economic, political and financial amenities as per their capabilities provided they are given the adequate opportunities. The father of economics Adam Smith as well as the welfare economists since Ronald Coase, Pareto and presently Amartya Sen(1987,1982); Martha Nasbaum(2011), Osberg and Sharpe (1998,2002,2003,2016), Easterlin(2001), Michel Porter, Anthony Atkinson(2015), Hagerty et. al. (2001) have emphasized and registered their views on the increase in the quality of life as well as on the sustainability of the wellbeing of the people across the globe. It has long been recognized that the real per-capita GDP cannot be a good index of economic wellbeing and this has been strongly echoed particularly since when Nordhus and Tobin (1972) developed an alternative measure of economic welfare by correcting GDP for its most evident limitations and also after the publication of the Stiglitz, Sen and Fittousi report of the commission of the measurement of Economic performance and social progress in 2009. Accordingly, a majority of the Governments of the countries of the World have bought about a major change in the systems of national Accounting (SNA) so as to capture and include of the missing elements in the GDP which are required for the present and the sustainability of the well being of the people across the countries. The UNDP as well as UNESCO has also promulgated the millennium development goals for reduction of poverty, inequality and also the sustainable development goals including 17 goals which came into effect in January 2016 and chalked out strategic plan for poverty eradication, democratic governance and peace building, climate change and disaster risk and economic inequality.

In fact, it is undeniable that GDP contains only the production of goods and services which are transacted in the market without taking into account or valuing the non-market transaction of good and service (health, education defensive expenses etc) done by both private, households and Government sectors contributing to the economic well-being of people; the underground legal and social value of leisure, health status, education, social securities, social

and economic cost of environmental degradation. Further, GDP is flow and it does not pay heed to the stock of wealth of the household as well as the society, the expected income from which largely influences the human behavior pertaining to consumption, saving, inter-generational transfer of productive base for sustainability of well being of the future generation of the household vis-à-vis the society. In fact, the use of per-capita real GDP which is basically an average figure does not focus on how it is distributed and whether all sections/classes of people have equal access to it. It is also obvious that measure of GDP does not take into account the issue of sustainability of well being of the people. The money metric measure of economic performance and living standard creates a lot of problems regarding the use of prices of goods and services and the related weights.

There has indeed been a wide range of studies on the measurement of social indicator, quality of life as well as well being of people from different corners of the society or countries across the World viz; Governments of the countries, NGOs and individual researchers etc. The major development in this field during the last 5 decades and upto now can be identified into four phases: i) development of professional organization that nurture its conceptual and empirical development ; ii) the wide spread political, popular and theoretical appeal of the quality of life concept; iii) A new era of construction of composite well being Index or summary social indicator and (iv) a recognition of the key role of the quality of the life concept in connecting social indicators to the study of subjective well being. The social indicators literature develops a large number of variables as social conditions of the people without congregating them into a single composite index so that it becomes difficult to have a complete insight on the trend in well being of the people (Land, 2000). Moreover, social indicators literature has put less emphasis on the economic aspects of well being. Actually, the social indicators movement was started since 1960 and a series of studies and reports have been published since then (Bauer, 1966). The U.S. Federal effort in developing social indicators' by Ferriss(1979); "Systems of social indicators and social reporting: the state of art" by Berger Schmitt and Jankowitsch (1999); "Quality of life indexes for national policy: review and agenda for research by Hagerty, Cummins , Ferriss, Land ,Michalos, Sharpe, Sirgy and Vogel (2001); "Social indicators and quality- of- life research; background, achievements and current trend" by Noll (2002) and "The quality-of-life(QOL) research movement: Past, present and future by Sirgy, Michalos, Ferriss, Easterlin and Patrick (2005).

The major questions of these studies centered round where we stand and are going with respect to our values, goals and to evaluate specie programme and determine their impact. The other important as well as comprehensive studies on the measurement of the trend in social indicators are done by Andrews et. al. (1989), Michalos (2011, 2014a, 2014b) Hegarty (2001). However, neither the research on social indicators have focused on the question why are they standing at the present level? And what are the trajectories behind the changes in the social indicators across the countries? nor there is any attempt to the quantification of the role of explanatory factors behind such changes.

Moreover, since the quality of life and preference pattern of the people differ across the countries in the globe ,the literature on the quality of life or social indicators emphasized the necessity of the incorporation of objective condition of life and the subjective experience of life quality, the structural relationship between the inter-dependant factors pertaining to this, the dynamic process of quality of life rather than its static state and finally the projection of the policy aspects for the study of the well being of the people. It is worth mentioning that the second OECD World forum on “Statistics, Knowledge and Policy” was produced in Istanbul declaration in 2007and there was a consensus between the representatives of European Commission, OECD, organization of Islamic conference, the UN, UNDP and the World bank for undertaking the measurement of societal progress of every country going beyond the conventional economic measure so as to evaluate the social well being. Parallely, Genuine Progress Indicator (GPI) has come into vogue in 1995 and it was developed by the think tank consisting of of three Californian researchers as a metric to replace or supplement the short comings of GDP towards the measurement of economic well being of the people of the nations across the World (Cobb, Halstead and Rowe , 1995) . GPI has two parts: i) the development of indicators and measures of progress and (ii) assessment of economic values of non-market, social and environmental assets generally not valued in conventional economic statistics. Actually, the GPI incorporates 26 social, economic and environmental variables.

However, the GPI includes many of the variables in the index of economic well being but it gives much greater weight to environmental variables because of the particular methodology used to estimate the losses associated with this variable namely crime, pollution, sickness, natural resource depletion. Indeed these losses become so large that they give the GPI trend a strong downward bias (Hagerty et. al., 2001; Osberg et. al. ,2002). Parallely, a composite index

the HDI with three equally weighted components viz. health, education and income are being developed for the countries in the globe since 1990 which is followed by a methodological change since 2010 (UNDP-2012). Such indexes also exclude the other parameters of wellbeing. In fact, both the GPI and HDI are more in the spirit of the measures of economic welfare developed by Nordhaus and Tobin (1972) three decades ago albeit these two measures also suffer from the limitations stated above. Actually, to answer the question “where do we want to go?”, we need to generate effective policy implications out of the measures of dynamics of economic well being. It is true that there is wide heterogeneity because of the differences in the preference, geographical location, and environmental situations across the countries in the globe as well as over time. Therefore one has to develop a suitable measure of wellbeing from which a fruitful policy implication may emerge. Almost all the measures developed so far lack this property.

Another holistic approach towards the measurement of wellbeing of the people was the happiness index which was initially developed in Bhutan and then the first world happiness index using data from Gallop World Poll has been started publishing since 2012. The parameters of measuring happiness are PCGDP, social support, healthy life expectancy, and freedom to make life choice, generosity and trust as well as corruption which are almost contained in the measures of wellbeing like GPI, HDI in varying degrees. It also suffers from the limitations in respect of dynamic policy implications as well as non-consideration of the impact of globalization, digitization as well as the technological change. Apart from the macro level studies there are a lot of efforts to develop quality of life as well as wellbeing index from primary data (Sengupta et. al., 2012; Hagerty et. al. 2001; Land, 2015; Atkinson, 2015; Glatzer, 2015; Anderson, 2015; Glatzer et. al. , 2015). Land et. al,2012; Osberg et al 2002:. As a professional group they have been producing composite social indicators so as to study the subjective wellbeing aspect of quality of life. On the whole, there has actually been a cross-current of studies, country specific, region specific and international, towards the measurement of wellbeing of the people through development of either composite wellbeing index or indexes of indicators (Osberg, Sharpe et. al., 2016; Jones and Klenow, 2010; Fleurbaey, M.et.al(2013); Osberg and Sharpe, 2002,1998; Easterlin,2001; Osberg,1985) etc.

Drawbacks of the Previous Studies:

The major drawbacks of the studies discussed above, can be succinctly outlined as follows: First, the flow of real per-capita consumption expenditure has not been taken into account net of the environmental cost of pollution in per-capita term. Second, while estimating stock of capital per capita the depreciation of capital which may takes place over time and across countries in varying degrees has not been deducted. Interestingly, Osberg et al(2002) have also not taken into account of the per capita environmental cost in current consumption and also the depreciation of the stock of capital in the in the accumulation of capital. Third, the heterogeneity of wellbeing indexes across countries and time as well as its dynamic aspects are not explained or accounted for in almost all the studies i.e. almost all the studies have failed to explain “why are we here?”. Fourth, inadequacy of real PCGDP as measure of wellbeing across countries and its dynamic aspects have not been estimated through dynamic panel regression set up. Fifth, after the development of composite wellbeing indexes none of the studies have tried to find out the explanatory factors behind the cross-country and cross-time variations in wellbeing indexes so that the policy variables could be identified for the improvement of the wellbeing of people across the countries in the globe.

Finally, it is well known that both the neo-classical and modern endogenous growth theories have emphasized the discounting of households preferences between present and future consumption such that in all the theoretical growth models, the discounting factor has been kept constant over time which is unrealistic. So for developing the composite wellbeing index the assignment of equal weight to all sub-indexes are not acceptable. Actually, the people belonging to globalised, computerized, digitalized as well as to the modern technological age obviously prefer more to higher quality of life through the consumption of sophisticated and conspicuous goods rather than living larger bequest for future generation. So, what is realistic is that one is to assign relatively higher weight to present consumption than future. We have in our paper assigned 60% weightage to present wellbeing. Taking into account of all these limitations and the methodology used by Osberg et. al.(1998,2002,2016) also following the suggestions of Stigliz et. al. report (2009) we have developed initially three indices of well being namely (i) present wellbeing indices (PWBI), (ii) future wellbeing indices (FWBI) and (iii) Social security indices (SSI) and then we developed composite wellbeing index consisting of above three with weightage 60% to

PWBI, 20% to FWBI and 20% to SSI for 32 developed and developing countries, the details of construction process are given in the next section.

II. Methodology of construction of wellbeing index and Data Base

Keeping in mind all the limitations of the previous studies we have tried to develop the wellbeing index for 32 developed and developing countries consisting the period ranging from 1990 to 2016. We have chosen this period firstly on the basis of the fact that globalization, digitalization, computerization seems to have produced substantial impact on the social, economic and political life of the people as well as on the preference pattern of the people across countries which have not been considered by other studies referred to above and second, the availability of required data base across the countries in the globe. Further it is assumed that the Integration of the countries through globalization and liberalization has taken place at the massive scale since 1990. In developing the composite indexes and its decomposed forms we have incorporated various social, economic, environmental, human development, financial development as well as indicators for sustainable development which are not at a time considered by all other studies through the consideration of their dynamic effect on the wellbeing indexes. We have distinguished between different components of wellbeing index for the policy generation purposes so that it becomes possible to capture the magnitude of changes i.e. ups and downs of individual indexes across the countries and to prescribe the required policies for improvement of overall wellbeing as well as quality of life of the people. In this study we have developed a composite wellbeing index which consists of three separate as well as mutually exclusive sub-indexes namely (i) the present wellbeing index (PWBI) of the people, (ii) future wellbeing index (FWBI) or sustainable wellbeing index and (iii) the social security index (SSI). We have assumed an additive relationship between these components or dimensional indexes. While adding together these sub-indexes we have given higher weights to the present wellbeing (60%) and lower equal weights i.e. 20% for each to the rest two sub-indices. While constructing indexes/component of indexes for countries we have used 1990 as base year (i.e. 1990= 100). We observe that the debates about the values, facts and the economic policies are intermingled such that it becomes difficult for the common people to separate them so that the political leaders and Governments always try to escape themselves from the reality. Therefore, our study tries to unveil that the democratic discourse is likely to be more productive if the issues of values, fact

and analysis can be separated as much as possible. Moreover apart from the centering round the issues to answer the question “Where are we ?” we are also inclined to answer the question “ why are we here or at this stage?” and how to bring about improvement upon the present status?. In our study, we have assumed that the overall wellbeing of a representative individual in a society depends on his present wellbeing (flow of real per-capita consumption), future wellbeing (the accumulation of savings, other productive asset etc.) and social security the individual enjoys in the society. Here, we assumed that (i)societal, economic wellbeing can be represented as the wellbeing of the representative agent or individual such that agent has risk averse utility function in which both personal consumption and bequest to future generation i.e. intergenerational transfer of productive resource are valued and (ii) the individual has complete information about the present market ,technology as well as the vector of consumer goods and luxury goods, accessibility to the financial institutions and markets and also about the government policies undertaken from time to time in the society.

The three individual components or dimensions of the composite wellbeing index are constructed as follows: First, in our study the present utility or wellbeing index (PWBI) is constructed by considering the following components:

(i)Flow of per-capita real consumption expenditure on goods and services (PCC); real per-capita government spending (PCGS) less the per-capita military expenditure (PCME) less per-capita environmental cost (PCEC):

$(PWBI)_{it} = [PCC+(PCGS-PCME)- PCEC] LEI$. We have adjusted our PWBI with the life expectancy index(LEI) with base year 1990(Osberg et el 2002).

We have computed the aggregate government savings and the private savings through the use of national income accounting method and then expressed them in per-capita term by dividing the same by the total numbers of population of the respective countries concerned. All these components are expressed at constant 2010 US\$ PPP. Since the value of more years of healthy life may be looked very different, the closer one is actually is to death, the change in life expectancy and morbidity which are occurring over time are assumed to effect the wellbeing of all now alive. So, to obtain an average impact of these on the wellbeing of the people now alive, we adjust per-capita consumption flows in each year upward by the percentage increase in

average life expectancy relative to the base year 1990=100. So, we have multiplied the sum by Life expectancy index (Osberg et. al. 2002).

Future Wellbeing index (FWBI) or Sustainability of wellbeing index consists of the following components: (i) real per-capita savings of the households sector (PCS); real per-capita government savings (PCGS); per-capita stock of capital net of depreciation (PCSKN) such that the depreciation rates varies both across countries and over time and per-capita government debt in real term (both domestic and foreign) (PCGD) and per-capita human resource (PCHR) which is measured in terms of the expenditure on education (primary, secondary and tertiary) in per-capita term; Net contribution of natural resources per capita (NCNRPC)

We have constructed FWBI or sustainability index as :

$$(\text{FWBI})_{it} = \text{PCS} + \text{PCGS} + \text{PCSKN} + \text{PCHR} + \text{NCNRPC} - \text{PCGD}.$$

It is worth noting that, we have computed the total government savings through the use of national income accounting technique and by dividing the same by population of respective countries we have the PCGS. NCNRPC is by computing the total contribution of natural resources to GDP(as Rental value) and then by dividing these figures by the population of the respective countries and further by deducting the per capita environmental cost from it. This is assumed to be the proxy of the net stock of natural resources per capita. Since all these components are assumed to represent the productive base of the economy for future, it is likely that this will continue to produce inter-generational transfer of wellbeing for future generation for the sustainability of well being..

Finally our social security index (SSI) of wellbeing consisting of the following components:

(i) The per capita social contribution of the Govt of the countries(PCSC) : it includes the unemployment compensation;. (ii) per-capita domestic credit (PCDC) provided by the countries concerned such that it is assumed to provide financial security to the people in respect of debt/ mortgaged financing; per-capita military expenses (PCME). We have added all these components giving equal weight to each so that

$$(\text{SSI})_{it} = \text{PCDC} + \text{PCME} + \text{PCSC}$$

It is worth mentioning that all these components are expressed at constant 2010 US\$ PPP

Therefore, our composite wellbeing index (CWBI)_{it} for ith countries (i= 1,2,3,4,5,.....,32) and t periods (t= 1990,1991,.....,2016) is computed as

$$(CWBI)_{it} = 0.6((PWBI)_{it} + 0.2 (FWBI)_{it} + 0.2 (SSI)_{it})$$

Further to answer the question “why and for what reasons are we here?” we have examined the heterogeneity in the trend of CWBI across the sample countries and the dynamic relationship of the same with the TFP, trade openness as indexes of globalization(TDOP), inflation, inequality(INQ)and life expectancy (LE)as an index of healthy life by considering the country specific indexes of rule of law as instrumental variables which are assumed to produce some impact as law and order situations on the cross country and cross time heterogeneity in the CWBI. This has helped us to find out the crucial explanatory factors responsible for the cross country variations in the CBBI over the period under consideration. We have estimated this relationship through the application of the Dynamic Panel Data (DPD) with Generalised Meth Moment od of (GMM).The econometric specification of the model used is discussed below.

Further to examine the common allegation that the PCGDP cannot serve as a sufficient indicator of well being of the people we have applied the dynamic panel regression technique for determining the dynamic relationship between the CWBI and the level and growth rate of real per capita GDP across the sample countries over time. We have fitted the following log linear dynamic panel regression equation:

$$\ln CWBI = \alpha + \delta \ln CWBI_{it-1} + \ln GPCGDP_{it} + \varepsilon_{it} + \eta_i$$

Where η_i denotes unobserved time invariant heterogeneity and ε_{it} is the idiosyncratic error component.

Moreover to see the dynamic relationship between the individual component of well being indexes and the real PCGDP as well its growth rates across the countries we have once again applied the dynamic panel regression technique in the above format.

Econometric Specification and the Data Base

Since the LSDV estimator is constituent for the static model irrespective of whether the effects are fixed or random, to estimate the cross-country variations in the composite well being (CWBI henceforth)over time andalso the present well being,the futute well being as well as the social security (PWBI,FWBI,SSI

), we have used the dynamic panel regression with GMM estimators by following Arellano- Bond method. The simplest model introduced by Arellano and Bond (1991) which we used can be expressed as

$$Y_{it} - Y_{it-1} = (\alpha-1) Y_{it-1} + \beta X_{it} + u_i + \varepsilon_{it} \quad (1)$$

Where, $i = 1,2,3,\dots,32$ (countries)

$t = 1,2,\dots,T$ (time) i.e. from 1990 to 2016; .

Here, Y_{it} represents the dependent variable; X_{it} represents the vector of explanatory variables (other than lag dependent variables) i.e X_{it} is a $(K-1) \times 1$ vector of exogenous regressors ; u_i stands for unobserved country specific effect i.e. the fixed effect and ε_{it} is the conventional error term such that $\varepsilon_{it} \sim N(0, \sigma^2)$ i.e. the random disturbance term.

We rewrite the eq(1) as

$$Y_{it} = \alpha Y_{it-1} + \beta X_{it} + u_i + \varepsilon_{it} \quad (2)$$

Now to eliminate the country specific effect (u_i) we take the first difference of equation (2) such that we have the dynamic panel model with GMM estimator as

$$\Delta Y_{it} = \alpha \Delta Y_{it-1} + \beta \Delta X_{it} + \Delta \varepsilon_{it} \quad (3)$$

Now the fixed effect (i.e. country specific effect) is eliminated. By construction ΔY_{it-1} is correlated with $\Delta \varepsilon_{it}$. Now the use of instrument is required to deal with (1) the likely endogeneity of explanatory variables and (2) the problem that the new error term in eq-3 is correlated with the lagged dependent variable (by construction). Under the assumption that there is no serial correlation in ε_{it} and the explanatory variable X are weakly exogenous, the GMM dynamic panel estimator uses the following moment conditions

$$E[Y_{it-s} (\varepsilon_{it} - \varepsilon_{it-1})] = 0 \quad \text{for } s \geq 2; t = 3,4,\dots,T \dots\dots\dots(4)$$

$$E[X_{it-s} (\varepsilon_{it} - \varepsilon_{it-1})] = 0 \quad \text{for } s \geq 2; t = 3,4,\dots,T \dots\dots\dots(5)$$

Now it follows that if the regressors are strictly exogenous, ε_{it} can not affect X_{is} for any s or t . Again if regressors are pre-determined, ε_i may affect for X_{is} for $s > t$. Strict exogeneity rules out any feedback from the idiosyncratic shock at time t to a regressor at time $s > t$.

It is worth noting that the consistency of GMM estimators depends on the validity of the instrument which produces their impact on the dependent variable through the regressors . To deal with this issue we need the specification test. In our study we use the Sargan test of over identifying restrictions which

actually tests the overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process.

Data Base

Our study is exclusively based on secondary data which are taken from World Development Indicators Data Base, PENN World Table 9.0 version, data base of UNDP. The data on the variables like GDP, per-capita GDP, GNI, per-capita GNI (at constant 2011 PPP international dollars), life expectancy (LE) in years, domestic credit provided by the financial sector (DCF), total factor productivity (TFP), capital stock and assets and its rate of depreciation, savings in percentage of GDP and GNI, data on unemployment rate, working age population labour force participation rate (LFPR) are taken from the above sources. However, the values of per-capita military expenses (PCME), per-capita households and government savings, values of depreciation of stock of capital, flow of per-capita consumption , per-capita human capital or resource in terms of per-capita education expenditure, per-capita social contribution , per-capita stock of capital and per-capita environmental cost are computed by us from the aggregate data available from the above reports and in some cases through the use of national income accounting method. It is worth mentioning that we have computed total environmental cost to the societies across the sample countries by multiplying the per-capita CO₂ emission by US\$ 20 per-ton cost of CO₂ emission over time (Fankhauser, 1995; Osberg and Sharpe, 2002). The data on the inequality has been taken from the World Income Inequality data base of United Nation's University, UNU-WIDER. It is again worth mentioning that in some countries Gini inequality figures for certain years (very few) are not available and in such cases we have used the ratio of the share of 10th decile group to national income to that of the 1st decile group. The data on the index of rules of law (estimated) across the sample countries are taken from World Wide Governance Index estimated by the World Bank Group. Here, the rule of law index reflects participation of the extenety and in particular the quality of contract enforcement, property rights, the police and the Courts as well as the crime and violence. We have used rule of law index as an instrumental variable which produces impact of the law and order situation on the CWBI through regressors.

IV. Analysis of the trends of Wellbeing indexes

We have computed the present well being index (PWBI) which consists of four components viz. flow of per-capita real consumption, per-capita government expenses, per-capita environmental cost and per-capita military expenses such that the latter two are deducted from the former two. Further, as we have stated that the computation of PWBI is done with the adjustment of life expectancy index and also without adjustment of the same. These indexes across the sample countries are formed by taking base year 1990=100 (see Appendix table 2A). It is evident from the trend in the series of indices across the countries for the three years (1990=100, 2010 and 2016) that almost all the countries have experienced substantial increase in the present wellbeing of the people in varying degrees such that the rate of increase in wellbeing in the two decades of present millennium are much higher in almost all the cases than the last decade of 20th century. The increase of present wellbeing index ranges from a minimum of 20% for Italy to a maximum of 1990% for China in the life expectancy adjusted present well being index of wellbeing followed by India (283% increase). Similar is the result for unadjusted PWBI ranging from a minimum of 11% for Italy to a maximum of 1799% in China followed by India (225% increase). It seems that digitalization, globalization, computerization as well as the technology transfer through trade liberalization have brought about change in the consumption pattern of the people across the countries so that the present wellbeing of people has gone up at a much faster space during the present millennium.

On the other hand, future wellbeing index (FWBI) consists of the sum of per-capita real savings (PC savings), per-capita stock of capital net of depreciation (PC net cap), per-capita expenses on education (PC exp on edu), per-capita government savings, per-capita net contribution of natural resources (PCNR) less the per-capita government debt such that PCNR is measured in terms of the total rental income from the natural resources less the environmental cost in per-capita term. However, if we see the trend in the future wellbeing index we see a somewhat different picture of the countries such that all the countries excepting Japan, Korea, Italy, China and Portugal have experienced increase in future well being moderately with a minimum value of less than 1% (i.e.of 0.9%) for Nigeria to a maximum of 543% for Indonesia (see appendix table-2B). Moreover, rate of increase in future wellbeing is also found to be much higher during the current millennium in almost all the countries.

Again, as far as the social security indexes (SSI) across the countries are concerned which is composed of per-capita domestic credit provided by the financial institutions, per-capita social contribution of the government (including unemployment compensation){ i.e PC social cont} and per-capita military expenses (PCME), we find that almost all the countries have experienced improvement in wellbeing in terms of social security in varying degrees ranging of 3.6% (in case of Cameroon) to a very high figure of 9879% in Denmark over the period from 1990 to 2016(see Appendix table 2C). It is worth mentioning

that the mean and standard deviation of the social security index are found to be very high mainly 847.50 and 1837.82 respectively, which indicate the average increase of 747% of social security with the high degree of variabilities across the countries and over the period under consideration (see appendix table-1). However, the average increase in the future wellbeing and life expectancy adjusted present wellbeing are 39% and 59% respectively over the period with the standard deviations of 72.59 and 149.9 respectively which indicate relatively a lower rate of increase in well being and degree of variability across countries as compared to that of FWBI. Interestingly, as far as the composite wellbeing index is concerned it is seen that all the countries have experienced increase in well being of the people over the period from 1990 to 2016 in varying degrees with a minimum achievement of 28.99% in Cameroon to a maximum of 2112% increase in Italy (see appendix table-2D).However the increase in the aggregate well being over the period are to some extent lower as compared to that of the PWBI across the sample countries in varying degrees.

It is also worth noting that the average increase in the aggregate wellbeing across the countries as well as over the period is 193% with a very high standard deviation of 382.23 indicating a high degree of variability in the achievement of wellbeing of people from 1990 to 2016 (see Appendix table 1 on - summary statistics). In case of aggregate wellbeing also we find that the rate of increase of wellbeing stands much higher during the current millennium. It is further noteworthy in this context that the composite well being is constructed by using unequal weighted arithmetic mean of its three components. We also construct composite well being index by computing geometric mean of its three components. The results reveal almost same pattern of achievement of well being of the people across the sample countries over the period under consideration(See Appendix Table 3). However, it seems that the use of equally weighted GM is much more appropriate for taking the average all components of well being as it satisfies several useful properties .In fact, the geometric mean penalizes the inequality in achievement across dimensions. Since this study is an attempt to capture the dynamism of well being such that the changes in the dimension indices have occurred in an unbalanced manner the use of arithmetic mean will lead to no change in CWBI. The use of GM in such case gives overall balance (Occasional paper , UNDP Human Development Report Office,2015).

V. Analysis of the result of dynamic panel regression:

Now,it is evident from section IV above, in which the analysis of the trends in the components/ dimensions indexes as well as the composite well being (CWBI) have been done (the results of which are given in appendix table 2Ato 2D) that there has been a wide variability in the achievements of well being of the people across the countries and during the period 1990-2016.Further the CWBI which is computed

by using GM also reveal the high degree of variability of the achievement of well being across the countries and time(Appendix table 1). So, it is imperative to account for the heterogeneity in the achievement of the well being of the people and to find out the trajectories behind such changes in the well being of people across the countries which has not been done in any of the previous studies undertaken either by the organizations like UNDP, World Bank, individual researchers, governments of the Countries and also by the individual research centre. Therefore, we have tried to find out the proximate explanatory factors operating behind the dynamics of heterogeneity in the achievement of wellbeing by conducting dynamic panel regression analysis with GMM method. We have run two dynamic panel regression in the form given in section III : (i) for composite wellbeing indexes (CILE) formed by using unequally weighted arithmetic mean method and (ii) for composite well being index (CILE) formed by taking geometric mean of the dimension indexes. In both the cases our explained or dependent variable is CILE and the independent or regressors are total factor productivity (tfp) as proxy of technological improvement; trade openness (TDOP) as an index of globalization; inequality; inflation; life expectancy (LE) as an index of health capital. All the variables are expressed in natural logarithmic form such that we have assumed a log-linear relationship between the dependent and independent variables in both of the panel. Since, the governance and law and order situation of any country produce impact on the well being of the people we have tried to capture it by using index of rule of law across the countries as an instrumental variable which is assumed to have produce an impact on the wellbeing through the explanatory factors. We have used the software STATA 14.0 for conducting the dynamic panel regression analysis.

The results of the dynamic panel regression analysis with GMM estimator following Arellano and Bond method for the first case are represented in table-1 below. It is worth saying that in this case the composite index is formed by taking unequal weighted arithmetic mean. It is evident from the table that the lagged CILE as an explanatory factor is highly significant. Further, the explanatory factors like technological improvement expressed as TFP, the globalization (or TDOP) and life expectancy (LE) are highly significant along with their expected signs. So, we can say that technological improvement, globalization as well as health capital play economically and statistically significant role in explaining the dynamics of heterogeneity of well being of the people across our sample countries during the period from 1990 to 2016. However , the law and order situation as an instrumental variable has played a crucial role to this end. It follows from the table that the Wald χ^2 is highly statistically significant indicating the correct specification of the model and the robustness of this is established by corresponding p-value given in the table. Further, the robustness of the significance of the explanatory factors are established by the corresponding p-values such that the explanatory variable TFP is significant with high probability of

occurrence, TDOP is significant at 1% level of significance and the significance level of LE is also very high. The coefficients of these explanatory factors indicate their respective elasticities such that 1% increase in the tfp across the countries brings about 0.55 % increase in the well being of the people, 1% increase in the trade openness results into 0.19% increase in the well being and finally 1% increase in health resource results into 2.33% increase in the well being of the people across the countries. However, the two other explanatory factors namely inequality and inflation are found to be insignificant. The value of Sargan test and its p-value in the table clearly indicates that there is overall validity of the instruments in analyzing the sample analog of the moment conditions used in the estimation process. On the whole, the major conclusions which emerge from this analysis is that the technological improvement, globalization and the health capital produced a significant impact on the dynamics of heterogeneity in the achievement of well being of the people across our sample countries over the period of our study. Since, our sample is composed of developed (OECD) as well as developing countries one may prescribe that more emphasis to be given on the trade liberalization, technological improvement and improvement in health of people for the further improvement in wellbeing of the people in future as because our result emerge from the ex-post analysis of the values of the variables.

Table-1: Results of Dynamic Panel Analysis (CILE is constructed by taking unequal weighted arithmetic mean)

Dependent Variable: Incile

Wald chi2(6) = 2521.39
 Prob > chi2 = 0.0000

Incile	Coeffs.	P>z
Incile		
L1.	.7979135	0.000
Intfp	.5478502	0.008
Intdop	.1902016	0.014
Ininq	-.1069824	0.423
lninf	.0119875	0.232
lnle	2.329249	0.000
_cons	-9.318851	0.000

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(235) = 381.1305

Prob > chi2 = 0.0000

The dynamic panel regression result with GMM estimator for accounting for the heterogeneity of composite wellbeing formed by taking geometric mean the individual components are given below in table-2. Interestingly, we find almost same results as we have been seen above excepting the improvement in the tfp elasticity of composite well being which is followed by a marginal decline in the values of the elasticities of health capital and trade openness . Here also, as is evident from table-2 that the lagged value of CILE is highly significant. On the other hand, the total factor productivity (TFP), trade liberalization (TDOP) and Health (LE) are also found to be highly significant with their desired signs in explaining the dynamics of heterogeneity in the achievement of wellbeing of the people over time and across our sample countries. The robustness of the level of significance of the explanatory factor is also established by their respective p-values. Further, the explanatory factors namely inequality and inflation are again found to be insignificant with inequality having negative desired sign. Here also the Wald chi² is found to be highly significant there by indicating the correct specification of the model and the robustness of this is established by the p-value. The Sargan test (Chi²) and its p-value also indicates the overall validity of the identification of instrumental variable in analyzing the sample analog of the moment conditions used in the estimating process. So, the results are robust in all cases. Therefore, we again conclude that the explanatory factors like TFP, TDOP and LE backed by the instrumental variable of the law and order situation (rule of law index) have produced positive significant impact on the increase in wellbeing of the people across our sample countries over the period. Interestingly, we do not find much difference between the formation of CWBI either by using unequal weighted arithmetic mean and by equally weighted geometric mean.

Table-2: Results of Dynamic Panel Regression (CILE is formed by using geometric mean)

Dependent Variable: Incilegm

Wald chi2(6)	=	1479.96
Prob > chi2	=	0.0000

Incilegm	Coeffs.	P>z
Incilegm		
L1.	.6817602	0.000
Intfp	.5905542	0.000
Intdop	.121205	0.045
lninq	.0029882	0.976
lninf	.0077796	0.334
lnle	1.769406	0.000
_cons	-6.409994	0.000

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(235) = 283.0621, Prob > chi2 = 0.0173

Now, to examine the common perception that the level and growth of per capita real GDP (GPCGDP) is an insufficient indicator of well being of people across the countries we have done dynamic panel regression analysis following Arellano-Bond method by assuming a log-linear relationship between the level of CILE and PCGDP as well as GPCGDP, the results of which are given in table-3 and 3a below. It follows from the table that the level of PCGDP plays economically and statistically significant role to the dynamics of heterogeneity of the wellbeing of the people. However, it interesting to note that the growth of PCGDP is found to play insignificant role in both of the two cases (i.e when CILE is computed by using weighted AM and GM). So one can conclude that growth of PCGDP is not an indicator well being of the people across the countries. The robustness of the significance of the specification as well as the robustness of the significance of coefficients of the PCGDP and its growth are established by Wald chi² value and its p-value and Sargan test (chi²) and its p-value as well as the p-values of the coefficient of explanatory factors. Interestingly, this leads us to conclude that for the improvement in the wellbeing of the people, the Governments of the countries should pay more hid to the distribution of GDP along with

its growth so that the per-capita real GDP be increased for all classes for the improvement in present wellbeing, future wellbeing as well as social security.

Table-3A : Dynamic Panel Regression results (CILE and CILEGM respectively with PCGDP)

Dependent Variable : Incile

Wald chi2(2) = 8455.14
Prob > chi2 = 0.0000

Incile	Coef.	P>z
L1.	.8474785	0.000
lnpcgdp	.2288813	0.000
_cons	-1.249205	0.000

Sargan test of overidentifying restrictions
H0: overidentifying restrictions are valid
chi2(324) = 559.7145
Prob > chi2 = 0.0000

Table 3A : Dependent Variable : Incilegm

Wald chi2(2) = 5650.41
Prob > chi2 = 0.0000

Incilegm	Coef.	P>z
L1.	.7588564	0.000
lnpcgdp	.2770171	0.000
_cons	-1.261239	0.000

Sargan test of overidentifying restrictions
H0: overidentifying restrictions are valid
chi2(324) = 402.2204
Prob > chi2 = 0.0020

Table-3B : Dynamic Panel Regression results (CILE and CILEGM respectively with GPCGDP) :
Dependent Variable : Incile

Wald chi2(2) = 1298.89
 Prob > chi2 = 0.0000

Incile	Coef.	z	P>z
Incile			
L1.	.8847716		0.000
Ingpcgdp	-.0106762		0.265
_cons	.6727327		0.000

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

Table 3B : Dependent Variable : Incilegm

Wald chi2(2) = 915.84
 Prob > chi2 = 0.0000

Incilegm	Coef.	P>z
Incilegm		
L1.	.785679	0.000
Ingpcgdp	-.0030293	0.688
_cons	1.156679	0.000

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(304) = 351.573

Prob > chi2 = 0.0312

VI. Concluding Observations

The major conclusions which emerge from our study can be outlined as follows. First, most of the studies done previously for the development of the index of qualities of life/or well being of the people across the countries in the globe, irrespective of whether these are done by the institutional organizations, governments of the countries, individual researchers, research institution suffer from serious limitations due to either (i) not taking in to account of the cost of environmental externalities in the present well being indexes or (ii) methodological errors or (iii) use of inappropriate weighting process or (iv) not capturing the dynamics of the trend of well being through the use of any econometric analysis or (v) lack of attempt for finding out the proximate explanatory factors behind the trend of the well being pattern of the people across the countries. In our study we have developed the well being indexes for 32 countries for the period from 1990 to 2016 by taking in to account of all of these shortcomings of the previous studies.

We find that all our sample countries have experienced increase in the well being of their people in varying degrees over the period 1990-2016. However the rates of increase in the well being of the people in current millennium are much faster than the same during the last decade of the last century. It seems that the process of globalization /trade liberalization, technological development and the rapid spread of the information technologies and the health capital across the countries helped accelerating the improvement of well being of the people. Further we find that the rates of improvement in the PWBI are much higher than those of the FWBI and SSI. Interestingly the results of our dynamic panel regression analysis also indicate that the technological progress, the globalization, the health capital along with the rule of law as an instrumental variable are the crucial explanatory factors for the dynamics of changes in the well being of the people across our sample countries. Moreover the level of real PCGDP are found to play a statistically and economically significant role for the cross country and cross time heterogeneity in the overall well being of the people. However our dynamic panel regression results clearly reveal that the growth rates of real PCGDP across our sample countries do not play any statistically and economically significant role towards the improvement of the aggregate well being of the people across our sample countries.

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Appendix table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
pwbiwotlei	864	151.5883	135.9258	64.21911	1899.318
pwbiwithlei	864	159.736	149.9918	47.97556	2090.702
futurewell~x	864	139.4085	72.59835	6.371531	643.4183
socialsecu~x	864	847.4999	1837.82	12.04712	11799.86
cile	864	293.2233	382.233	68.78534	2452.508
cilegeomean	864	205.2553	120.1883	49.38872	704.9633
tfp	750	.9575267	.1004851	.5910667	1.236055
tdop	861	62.4844	34.0798	13.75305	220.4073
inflation	862	9.070488	71.68219	-5.665685	2076.793
inequality	782	30.71452	11.82203	.031941	59.5
ruleoflaw	864	.5596434	1.039238	-1.441895	2.100273
pcgdp	864	20821.17	18765.43	399.4839	61174.55
pcgni	863	21251.52	14978.13	1318.591	53442.07
le	864	72.87917	14.25712	46.07283	404.639

Appendix Table 2A: Trends in Present Wellbeing Index (All variables are measured at constant US\$ 2010 PPP)

Country	Year	LE INDEX	PC Con	PC Gov Exp	PCME	Env cost	Current WBI	LE adj curr WBI	PWBI with LEI
Argentina	1990	1	4526.012	186.2368	86.18086	68.52964	4557.539	4557.539	100
	2000	1.03092	6733.427	1127.919	94.00464	76.71147	7690.629	7928.425	173.962875
	2016	1.06696	8726.522	1871.607	97.01628	91.8678	10409.24	11106.25	243.6895949
Australia	1990	1	26891.76	6163.495	760.3226	309.0576	31985.88	31985.88	100
	2000	1.029087	31840.95	7851.03	838.725	344.0122	38509.24	39629.34	123.896384
	2016	1.07087	40958.71	10501.11	1114.149	335.9981	50009.67	53553.83	167.4296355
Bangladesh	1990	1	369.8395	16.19208	4.955181	2.925626	378.1508	378.1508	100
	2000	1.118636	435.4863	25.32778	7.326615	4.236044	449.2514	502.5487	132.8963792
	2016	1.232527	763.5164	60.66778	14.84435	8.52445	800.8154	987.0263	261.0139412
Bolivia	1990	1	1119.077	159.6678	38.24639	16.79401	1223.704	1223.704	100
	2000	1.101307	1297.243	235.0335	33.34874	26.54114	1472.386	1621.549	132.5115605
	2016	1.247378	1858.185	430.7685	41.16906	35.73309	2212.051	2759.263	225.4845118
Canada	1990	1	28546.77	8283.047	701.263	313.1814	35815.37	35815.37	100
	2000	1.024032	30993.7	8365.568	487.9113	347.3423	38524.02	39449.82	110.1477265
	2016	1.061524	39118.94	10648.46	497.9538	304.7447	48964.7	51977.21	145.1254235
Cameroon	1990	1	908.4521	172.0854	19.79083	2.96109	1057.786	1057.786	100
	2000	0.969111	918.8873	124.3234	14.19505	4.494251	1024.521	992.8748	93.86352173
	2016	1.043722	1197.033	184.2154	17.9819	6.028861	1357.237	1416.579	133.9192589
China	1990	1	0	99.37305	18.67855	43.03142	37.66308	37.66308	100
	2000	1.039112	0	294.6999	33.53796	53.93725	207.2247	215.3297	571.7262424
	2016	1.100765	0	996.0385	132.5647	148.1319	715.3419	787.423	2090.702371
Denmark	1990	1	33434.31	10654.96	854.2823	195.414	43039.57	43039.57	100
	2000	1.023893	39319.49	13333.66	813.9918	192.2635	51646.89	52880.88	122.8657408
	2016	1.084147	44170.9	15401.96	694.3484	134.4512	58744.06	63687.19	147.9735837
Finland	1990	1	26129.23	7006.059	507.0877	207.5434	32420.65	32420.65	100
	2000	1.035457	28829.63	8011.348	502.0488	202.5695	36136.36	37417.66	115.4130474
	2016	1.087848	36941.28	10991.19	623.7869	186.6798	47122	51261.58	158.1139551
France	1990	1	25226.17	6830.176	1088.61	128.4134	30839.32	30839.32	100
	2000	1.032064	29260.82	8507.081	951.8881	118.9333	36697.08	37873.73	122.8098786
	2016	1.079252	33558.69	9928.929	950.1663	99.32196	42438.13	45801.45	148.5164212
Germany	1990	1	24437.49	6133.527	775.3594	235.793	29559.87	29559.87	100
	2000	1.036573	29099.14	7092.155	548.5541	201.9128	35440.83	36737.01	124.2800157
	2016	1.078652	33935.93	8954.712	540.3126	183.1236	42167.21	45483.76	153.8699576
Greece	1990	1	16826.86	3388.902	632.3252	145.6904	19437.74	19437.74	100

	2000	1.012332	20294.88	4250.097	806.5768	169.5687	23568.84	23859.48	122.7481779
	2016	1.060422	20656.45	4601.97	587.2925	135.41	24535.72	26018.21	133.8540497
Hungary	1990	1.060422	7315.584	2200	587.2925	134.273	8794.019	9325.367	47.97556282
	2000	0.918612	8302.256	2204.73	158.7295	109.3459	10238.91	9405.581	102.1316
	2016	0.987288	10800	3036.628	149.4437	91.50952	13595.67	13422.85	145.7535455
Indonesia	1990	1	934.306	144.0857	24.38723	16.48683	1037.518	1037.518	100
	2000	1.047218	1434.402	131.4949	13.77927	24.90483	1527.213	1599.324	154.1490817
	2016	1.091871	2569.683	375.5411	34.81799	43.56338	2866.842	3130.223	301.7031145
India	1990	1	397.1484	61.90215	17.39672	14.23126	427.4226	427.4226	100
	2000	1.080887	580.5602	93.17807	23.18357	19.59741	630.9573	681.9936	159.5595513
	2016	1.179568	1251.131	216.8802	46.06917	31.81948	1390.123	1639.744	383.6353059
Israel	1990	1	18060.13	5759.979	2592.764	155.7767	21071.57	21071.57	100
	2000	1.030628	22199.89	6712.828	1955.976	191.6356	26765.11	27584.87	130.9103879
	2016	1.071062	27321.47	7523.481	1905.825	173.3943	32765.74	35094.15	166.5473951
Italy	1990	1	24867.47	6063.367	612.2904	147.2341	30171.31	30171.31	100
	2000	1.036473	28528.83	6470.092	710.1791	158.2535	34130.49	35375.32	117.2481898
	2016	1.084701	27700.02	6448.213	516.7146	120.2472	33511.27	36349.71	120.4777323
Japan	1990	1	26120.33	5152.932	347.6814	177.4659	30748.12	30748.12	100
	2000	1.028404	30952.88	7106.454	392.6573	192.447	37474.23	38538.64	125.3365891
	2016	1.063509	36247.62	9415.972	445.0298	191.0414	45027.52	47887.17	155.7401531
Korea	1990	1	5862.284	952.7064	306.38	115.2075	6393.403	6393.403	100
	2000	1.063613	10284.33	1712.602	371.166	190.4186	11435.35	12162.79	190.2397291
	2016	1.15226	16115.42	3873.332	663.7484	233.5747	19091.43	21998.29	344.0779211
Malaysia	1990	1	2813.836	625.5284	115.8823	62.74732	3260.735	3260.735	100
	2000	1.029824	3496.3	712.5425	114.5842	108.4587	3985.799	4104.673	125.8818237
	2016	1.058194	7291.089	1387.399	155.1479	155.9248	8367.415	8854.35	271.5446138
Morocco	1990	1	1402.224	272.4792	61.52521	18.92521	1594.253	1594.253	100
	2000	1.059015	1607.982	350.9868	44.08161	23.5047	1891.382	2003.002	125.6389138
	2016	1.148558	2518.175	626.3427	104.4934	35.59847	3004.426	3450.759	216.4498548
Netherland	1990	1	25841.12	7679.393	837.8796	211.8895	32470.75	32470.75	100
	2000	1.014435	32470.5	9428.42	667.3779	217.8945	41013.65	41605.69	128.1328434
	2016	1.062817	35264.18	12928.81	622.8062	204.7904	47365.4	50340.77	155.0342035
Pakistan	1990	1	671.727	112.2847	52.86554	12.73522	718.4109	718.4109	100
	2000	1.044284	769.3135	73.3473	35.37712	15.36916	791.9145	826.9835	115.1128766
	2016	1.104236	1087.354	133.1772	42.71475	18.27394	1159.542	1280.408	178.2278453
Paraguay	1990	1	2226.3	134	52.63976	10.26892	2297.392	2297.392	100
	2000	1.030319	2052.023	295.3181	36.21815	13.91367	2297.21	2366.859	103.0237428
	2016	1.073707	2989.811	466.1327	49.12592	16.90211	3389.915	3639.777	158.4308384
Portugal	1990	1	13361.61	2550.255	397.4554	84.78398	15429.62	15429.62	100
	2000	1.031755	17647.75	4092.377	400.6572	121.9281	21217.55	21891.31	141.8784388
	2016	1.102157	19062.94	4040.796	412.2773	87.94203	22603.52	24912.62	161.4596598

Srilanka	1990	1	944.5168	117.7916	28.10307	4.4648	1029.741	1029.741	100
	2000	1.020478	1440.186	193.0999	92.47946	10.90224	1529.904	1561.233	151.6142535
	2016	1.075685	2796.664	322.3269	91.81696	15.73205	3011.442	3239.363	314.5805518
South Africa	1990	1	4739.807	1124.433	228.8105	166.8266	5468.603	5468.603	100
	2000	0.898854	4387.934	1093.287	82.4882	165.6153	5233.118	4703.809	86.01481926
	2016	0.924675	6078.167	1545.037	80.32298	177.7677	7365.113	6810.339	124.53525
Sweden	1990	1	28566.92	9478.478	896.5054	121.3874	37027.5	37027.5	100
	2000	1.027175	32998.2	10966.61	823.9309	111.2486	43029.63	44198.96	119.3679244
	2016	1.064671	39485.62	14796.04	585.4081	98.35881	53597.9	57064.13	154.1128224
UK	1990	1	24138.27	5200.172	1022.076	194.2176	28122.15	28122.15	100
	2000	1.024525	29601.29	5861.882	761.1336	183.991	34518.05	35364.61	125.7535905
	2016	1.07544	35564.35	7914.778	765.0796	143.9605	42570.09	45781.56	162.7953922
USA	1990	1	30035.63	5756.909	1859.287	386.455	33546.79	33546.79	100
	2000	1.018905	36748.73	6326.669	1321.682	403.575	41350.14	42131.87	125.5913558
	2016	1.04689	43903.84	7473.433	1718.401	331.166	49327.71	51640.69	153.9363053
Turkey	1990	1	5449.512	742.544	238.981	54.10015	5898.975	5898.975	100
	2000	1.088936	6556.185	987.3686	301.5769	68.35892	7173.618	7811.61	132.4231743
	2016	1.173358	10596.2	2094.264	241.9953	87.61695	12360.85	14503.71	245.8682792
Nigeria	1990	1	917.3772	597.5942	10.88125	8.228523	1495.862	1495.862	100
	2000	1.011141	894.2507	111.6745	10.22863	12.43253	983.264	994.2189	66.46463224
	2016	1.150479	1746.46	202.9585	10.63285	11.43789	1927.348	2217.373	148.2338232

Source : Author's Computation .

APPENDIX TABLE 2B: Trends in future well being (All variables are measured at constant US\$ 2010 PPP)

Country	Year	PC Savi.	PC Net cap	PC exp on Edu	PC Gov Savings	Env Cost	PC Gov Debt	PCNR	Sum	Index
Argentina	1990	1744.793	31.7713	122440	101.1591	68.52964	2735.086	137.0644	121651.2	100
	2000	1947.433	51.12582	132780.1	-340.531	76.71147	4167.83	172.6503	130366.3	107.164
	2016	2970.275	69.33496	147895.4	-616.102	91.8678	3787.441	132.2468	146571.9	120.4854
Australia	1990	6785.656	432.1054	486951.9	1872.544	309.0576	14792.99	1227.386	482167.5	100
	2000	7549.843	490.9753	590834.2	2348.911	344.0122	24861.84	1361.759	577379.9	119.7467
	2016	10102.93	543.0818	755154.9	1943.092	335.9981	49769.81	3062.145	720700.3	149.471
Bangladesh	1990	212.3322	3.003266	4470.637	-16.1921	2.925626	1000	2.5723	3669.427	100
	2000	444.3504	5.746832	10435.64	-25.3278	4.236044	1000	3.259997	9859.429	268.6913
	2016	1131.154	10.11455	18653.28	29.57504	8.52445	1000	7.945754	18823.54	512.9833
Bolivia	1990	361.3052	7.776089	26500	-61.3824	16.79401	1255.044	94.74626	25630.61	100
	2000	488.9664	15.07562	30182.16	-35.7012	26.54114	1144.336	56.83785	29536.46	115.239
	2016	932.547	30.00484	41000	-430.768	35.73309	953.5589	147.6975	40690.19	158.7562
Canada	1990	5567.051	326.3536	481316.1	-3115.03	313.1814	19605.39	1145.582	465321.4	100
	2000	8884.173	372.0523	566538.4	-1860.24	347.3423	25894.88	1982.116	549674.3	118.1279
	2016	8535.423	444.2543	592102.4	-4532.3	304.7447	32500.03	508.4112	564253.4	121.261
Cameroon	1990	448.4046	9.859578	13593.18	-172.085	2.96109	1500	169.121	12545.52	100
	2000	386.0427	9.730419	13593.18	-124.323	4.494251	1500	128.5012	12488.64	99.54659
	2016	486.8498	16.45104	19150.81	-184.215	6.028861	1500	94.74909	18058.62	143.9447
China	1990	586.2905	7.130221	10925.19	-99.3731	43.03142	3849.96	59.70753	7585.951	100
	2000	1351.733	28.67193	20791.4	-294.7	53.93725	3285.388	43.85999	18581.64	244.948
	2016	6565.13	144.8241	20791.4	-996.038	148.1319	21267.3	77.92265	5167.803	68.12334
Denmark	1990	7942.227	377.247	477832.7	2593.009	195.414	47900.43	253.4749	440902.8	100
	2000	10691.07	529.9469	856980.5	4311.854	192.2635	57824.23	806.8015	815303.7	184.9169
	2016	12684.56	489.6636	821912.5	5056.531	134.4512	111512.1	303.3902	728800.2	165.2972
Finland	1990	7488.958	421.6375	404703.1	1173.224	207.5434	18656.95	160.1899	395082.6	100
	2000	11116.84	397.4522	492318.3	1807.192	202.5695	32896.41	171.4137	472712.2	119.649
	2016	7828.657	369.4995	557271.2	-1367.48	186.6798	70158.83	261.097	494017.5	125.0416
France	1990	6875.543	320.9831	315836.1	-752.869	128.4134	16141.22	35.07896	306045.2	100
	2000	8303.614	349.9162	415652.8	448.3745	118.9333	32166.94	26.16937	392495	128.2474
	2016	7856.555	342.3437	400327.4	-206.159	99.32196	78774.91	16.58185	329462.5	107.6516
Germany	1990	7764.553	333.504	324110.3	-2941.98	235.793	12423.97	77.23079	316683.8	100
	2000	8128.778	352.0964	334500	-2660.08	201.9128	36240.87	36.4262	303914.4	95.96779
	2016	12160.22	341.8647	501265	-3811.94	183.1236	67083.62	27.37276	442715.8	139.7974
Greece	1990	4947.678	117.5814	139533.9	-457.801	145.6904	7203.36	48.49544	136840.8	100
	2000	4482.459	164.2115	161945.2	980.0168	169.5687	15436.09	16.7356	151982.9	111.0655

	2016	2318.892	82.05763	240982.8	1471.416	135.41	37604.61	19.98907	207135.2	151.3695
Hungary	1990	1982.042	85.75855	86091.52	59.4351	134.273	5386.062	0	82698.43	100
	2000	3648.75	115.4817	108298.3	124.04	109.3459	5879.778	70.92664	106268.4	128.5011
	2016	6024.482	139.4253	134211.4	464.2931	91.50952	23281.32	44.36751	117511.1	142.0959
Indonesia	1990	1148.276	22.31681	12215.02	162.833	16.48683	1092.517	193.1944	12632.64	100
	2000	1165.681	18.81816	18761.59	-131.495	24.90483	2007.176	187.8515	17970.36	142.2535
	2016	3322.274	45.57369	78962.21	35.06321	43.56338	1184.269	99.20502	81236.49	643.0683
India	1990	481.8464	6.553448	8934.023	-7.59582	14.23126	143.1341	18.59618	9276.057	100
	2000	704.7764	9.544953	12753.89	-25.1092	19.59741	165.9566	19.30178	13276.85	143.1303
	2016	1862.168	28.44787	21779.78	-216.88	31.81948	362.9908	35.51823	23094.22	248.9659
Israel	1990	4435.41	184.2051	358608.9	-83.0955	155.7767	1500	1.706317	361491.3	100
	2000	5395.645	293.8817	358608.9	782.9304	191.6356	1500	0.507985	363390.2	100.5253
	2016	7915.827	288.6574	467918.8	346.9588	173.3943	1500	62.43588	474859.2	131.3612
Italy	1990	6534.605	272.4335	272344.6	1417.547	147.2341	10742.54	32.94009	269712.3	100
	2000	7588.068	306.3411	341853	1674.702	158.2535	29957.61	35.52752	321341.8	119.1424
	2016	6449.869	206.5804	269152.7	1685.454	120.2472	39568.99	22.56251	237827.9	88.17835
Japan	1990	10775.81	705.9008	441422.7	-256.298	177.4659	17858.77	12.86653	434624.7	100
	2000	10157.06	591.6504	413700.4	-2732.5	192.447	10910.16	4.023994	410618	94.47645
	2016	10226.78	514.9377	429276.3	-4128.19	191.0414	19573.16	8.034617	416133.7	95.74552
Korea	1990	4738.512	193.9924	250000	199.558	115.2075	1076.477	5.823657	253946.2	100
	2000	7108.292	269.9388	250000	497.3592	190.4186	4194.475	1.700146	253492.4	99.8213
	2016	12333.43	355.3242	50000	-88.987	233.5747	10921.86	4.671149	51449	20.2598
Malaysia	1990	3189.18	101.9985	90215.85	-625.528	62.74732	1649.055	1162.833	92332.53	100
	2000	5827.996	128.6309	149940.1	245.4534	108.4587	3405.791	687.0489	153315	166.0466
	2016	7124.647	157.4502	227693.6	131.2847	155.9248	3982.488	473.9453	231442.5	250.6619
Morocco	1990	1187.309	20.00334	36352.91	51.71269	18.92521	1504.339	13.00265	36101.68	100
	2000	1125.517	26.62103	51004.15	-350.987	23.5047	1113.352	14.07102	50682.52	140.3883
	2016	2125.63	48.58894	48545.15	-626.343	35.59847	836.2292	80.67433	49301.87	136.5639
Netherland	1990	8900.5	365.1085	389182.9	690.1453	211.8895	27985.77	321.4345	371262.5	100
	2000	12424.67	456.3455	510954	351.2028	217.8945	68802.5	231.7217	455397.6	122.6619
	2016	13217.87	379.144	604726.1	-1329.49	204.7904	159371.2	194.8416	457612.5	123.2585
Pakistan	1990	685.7176	7.026545	6147.039	-112.285	12.73522	0	14.16986	6728.933	100
	2000	712.8936	7.550441	7204.782	12.27109	15.36916	0	13.51811	7935.646	117.9332
	2016	1108.921	7.565566	14856.57	-133.177	18.27394	0	14.24639	15835.85	235.3397
Paraguay	1990	1309.427	18.76585	20989.85	-178.893	10.26892	1133.677	73.65143	21068.86	100
	2000	797.6	12.04574	58048.76	-295.318	13.91367	1173.759	42.41288	57417.83	272.5246
	2016	1263.211	25.59784	63530.93	27.68524	16.90211	1067.753	88.71135	63851.48	303.0609
Portugal	1990	5622.423	168.132	171252.1	397.8448	84.78398	5686.569	58.98808	171728.1	100
	2000	4573.269	231.1899	260406.7	428.0638	121.9281	26404.01	32.12447	239145.4	139.2582
	2016	3865.502	110.8785	213111.1	1012.47	87.94203	51225.81	59.18296	166845.4	97.15675
Srilanka	1990	744.9339	9.962371	13549.72	111.7754	4.4648	851.5684	5.636718	13565.99	100

	2000	1202.084	22.55505	19631.98	73.33585	10.90224	996.0242	3.472219	19926.5	146.8857
	2016	2881.539	45.9293	66646.48	142.4382	15.73205	1545.043	5.36698	68160.98	502.4401
South Africa	1990	2056.554	72.96293	123908.3	275.6729	166.8266	1200.942	350.0884	125295.8	100
	2000	1582.052	46.57637	123908.3	294.7282	165.6153	1516.023	172.4436	124322.5	99.22316
	2016	2021.215	85.07318	135626.6	490.2323	177.7677	1950.85	352.5191	136447.1	108.8999
Sweden	1990	8636.573	528.5298	312747.7	-1252.16	121.3874	28275.53	172.9335	292436.6	100
	2000	10109.49	486.8449	577589.2	2451.214	111.2486	40877.24	117.8428	549766.1	187.995
	2016	13158.82	556.982	814337.9	852.8364	98.35881	110287.8	229.441	718749.8	245.7797
UK	1990	5513.213	302.3887	320355.5	1729.147	194.2176	39891.59	304.0302	288118.5	100
	2000	5193.158	291.3339	428782.2	3469.542	183.991	73343.8	369.8232	364578.3	126.5376
	2016	4570.845	246.369	574009.1	2824.425	143.9605	167944.8	164.4622	413726.4	143.5959
USA	1990	7082.985	389.2853	61000	-1967.16	386.455	10345.11	513.1625	56286.71	100
	2000	9481.774	541.0208	61000	-501.793	403.575	20676.96	497.4865	49937.96	17.33244
	2016	10132.57	471.504	684446.6	-1769.27	331.166	49850.76	147.3904	643246.8	223.2578
Turkey	1990	2363.069	82.69534	56000	40.46442	54.10015	2260.921	40.12348	56211.33	100
	2000	2800.929	110.9092	52272.03	-987.369	68.35892	3666.757	19.01541	50480.4	89.80467
	2016	4815.304	211.963	174821	492.6408	87.61695	5590.324	46.19122	174709.1	310.8076
Nigeria	1990	695.3471	6.942625	100000	-597.594	8.228523	1459.965	692.3242	99328.83	100
	2000	805.0083	3.457798	100000	-111.674	12.43253	874.6346	485.8534	100295.6	100.9733
	2016	970.3102	22.09644	100000	-202.959	11.43789	675.3776	133.4544	100236.1	100.9134

Source : Author's Computation .

APPENDIX TABLE-2C: TRENDS IN SOCIAL SECURITY INDEX (All variables are measured at constant US\$ 2010 PPP)

Country	Year	PCDCF	PC social contribution	PCME	SUM	Index
Argentina	1990	1925.711	268.9791	86.18086	2280.871	100
	2000	2819.074	271.7238	94.00464	6255.856	274.2749
	2016	3936.763	713.1686	97.01628	7193.101	315.3664
Australia	1990	25167.45	51.78887	760.3226	25979.57	100
	2000	41265.25	63.72913	838.725	46345.94	178.3938
	2016	102042.5	63.72913	1114.149	113985.8	438.7517
Bangladesh	1990	86.41324	63.72913	4.955181	91.36842	100
	2000	153.6931	63.72913	7.326615	242.7844	265.7202
	2016	632.6038	63.72913	14.84435	988.7354	1082.141
Bolivia	1990	311.9714	15.17311	38.24639	365.3909	100
	2000	1002.746	24.61752	33.34874	1442.433	394.7644
	2016	1882.743	29.73563	41.16906	2684.854	734.7894
Canada	1990	36703.46	1216.358	701.263	38621.08	100
	2000	48465.38	1723.26	487.9113	55112.62	142.7009
	2016	85861.71	2071.023	497.9538	6588.541	17.05944
Cameroon	1990	416.553	35	19.79083	436.3438	100
	2000	154.2749	35	14.19505	334.0297	76.55196
	2016	278.3091	35	17.9819	452.0409	103.5974
China	1990	646.2191	250	18.67855	664.8976	100
	2000	2097.75	250	33.53796	2393.002	359.9053
	2016	14823.41	300	132.5647	17214.26	2589.008
Denmark	1990	83504	613.9488	854.2823	1468.231	100
	2000	84301.25	1176.182	813.9918	4724.358	321.7721
	2016	130407.6	550	694.3484	146526.1	9979.768
Finland	1990	23050.55	835.0556	507.0877	1342.143	100
	2000	24059.25	4667.631	502.0488	10947.45	815.6691
	2016	70849.81	5692	623.7869	82753.34	6165.76
France	1990	37558.25	5347.444	1088.61	6436.054	100
	2000	38552.6	6673.311	951.8881	13139.49	204.1545
	2016	65196.34	7800	950.1663	77095.46	1197.868
Germany	1990	52550	5250	775.3594	775.3594	100
	2000	53248.26	6457.557	548.5541	10945.7	136.1664
	2016	61190.64	7035	540.3126	68868.41	856.7348
Greece	1990	22500.37	1269.219	632.3252	1901.544	100
	2000	23507.25	2692.423	806.5768	7311.169	384.4858

	2016	28671.83	3200	587.2925	40654.85	2137.991
Hungary	1990	5030.25	1267	190	3817.518	100
	2000	5250.32	1356.098	158.7295	2805.845	73.49919
	2016	8671.695	7.05	149.4437	10381.36	271.94
Indonesia	1990	806.974	7.05	24.38723	831.3612	100
	2000	1221.479	6.85	13.77927	1688.47	203.097
	2016	1905.006	11.47295	34.81799	2875.445	345.8719
India	1990	276.3208	0.058006	17.39672	293.7756	100
	2000	402.4163	0.045346	23.18357	592.0936	201.5463
	2016	1403.187	600	46.06917	1970.168	670.6372
Israel	1990	19984.76	574.6701	2592.764	23152.2	100
	2000	19948.3	1546.92	1955.976	28632.8	123.6721
	2016	27322.04	1819.406	1905.825	33571.93	145.0054
Italy	1990	30550.32	4524.553	612.2904	612.2904	100
	2000	31550	4192.266	710.1791	10666.38	212.5023
	2016	58665.58	4414.783	516.7146	70468.66	1403.921
Japan	1990	95671.96	40	347.6814	96019.64	100
	2000	124399.3	45.89471	392.6573	130270.1	135.6703
	2016	164371.4	43.65961	445.0298	176767.6	184.0952
Korea	1990	4148.477	64.64977	306.38	4519.507	100
	2000	10715.11	426.1772	371.166	13400.51	296.5039
	2016	43301.14	1721	663.7484	52454.17	1160.617
Malaysia	1990	3295.608	150	115.8823	3411.491	100
	2000	9699.338	150	114.5842	10697.02	313.5586
	2016	16024.42	150	155.1479	18240.29	534.672
Morocco	1990	637.8819	26.70489	61.52521	726.112	100
	2000	1541.335	45	44.08161	2434.38	335.2624
	2016	3522.498	165	104.4934	5175.803	712.8106
Netherland	1990	60550.57	5339.259	837.8796	6177.138	100
	2000	62550.45	6807.008	667.3779	9006.086	145.7971
	2016	106474.9	7322	622.8062	117739	1906.044
Pakistan	1990	377.363	26.25	52.86554	430.2286	100
	2000	353.0411	26.25	35.37712	717.2178	166.7062
	2016	616.6017	26.25	42.71475	1057.744	245.8564
Paraguay	1990	368.4308	60	52.63976	421.0706	100
	2000	728.0721	60	36.21815	1303.172	309.4902
	2016	1772.93	188.7742	49.12592	2567.939	609.8595
Portugal	1990	29352	1153.589	397.4554	1551.045	100
	2000	29352	2224.195	400.6572	3982.662	256.7729
	2016	35739.24	2500	412.2773	44376.32	2861.06
Srilanka	1990	458.3898	1.300278	28.10307	487.7931	100

	2000	803.6606	5.162314	92.47946	1460.21	299.3502
	2016	2716.821	5.704845	91.81696	3674.628	753.3169
South Africa	1990	5743.309	26.96376	228.8105	5999.083	100
	2000	8833.694	31.54554	82.4882	11722.75	195.409
	2016	13261.48	50	80.32298	17565.73	292.8069
Sweden	1990	44506.25	4630.324	896.5054	5526.83	100
	2000	46550.25	2231.842	823.9309	5999.577	108.5537
	2016	87436.25	1690	585.4081	98496.11	1782.145
UK	1990	31421.77	1879.673	1022.076	34323.52	100
	2000	41506.46	2348.96	761.1336	48235.95	140.5332
	2016	69555.34	3100	765.0796	78268.85	228.0327
USA	1990	52733.16	2329.438	1859.287	56921.88	100
	2000	86039.61	2888.264	1321.682	94161.63	165.4225
	2016	126664.5	3457.978	1718.401	141217.9	248.0907
Turkey	1990	1318.775	875.4887	238.981	1557.756	100
	2000	3049.207	875.4887	301.5769	5857.242	376.0051
	2016	11378.88	880	241.9953	20106.06	1290.707
Nigeria	1990	301.0274	85	10.88125	311.9087	100
	2000	128.7819	88	10.22863	342.383	109.7703
	2016	652.1724	90	10.63285	1099.178	352.4038

Source : Author's Computation .

APPENDIX TABLE 2D: Trends in Composite well being (Using unequal weighted AM)

Country	Year	PWBI with LEI	Future well being index	Social security Index	CILE
Argentina	1990	100	100	100	100
	2000	173.9629	107.164	266.0486	179.0202
	2016	243.6896	120.4854	295.5747	229.4258
Australia	1990	100	100	100	100
	2000	123.8964	119.7467	173.3516	132.9575
	2016	167.4296	149.471	409.7153	212.295
Bangladesh	1990	100	100	100	100
	2000	132.8964	268.6913	237.5395	180.984
	2016	261.0139	512.9833	877.9862	434.8023
Bolivia	1990	100	100	100	100
	2000	132.5116	115.239	358.4508	174.2449
	2016	225.4845	158.7562	589.0673	284.8554
Canada	1990	100	100	100	100
	2000	110.1477	118.1279	139.352	117.5846
	2016	145.1254	121.261	16.0707	114.5416
Cameroon	1990	100	100	100	100
	2000	93.86352	99.54659	78.99196	92.02582
	2016	133.9193	143.9447	99.25766	128.992
China	1990	100	100	100	100
	2000	571.7262	244.948	346.3584	461.297
	2016	2090.702	68.12334	2352.009	1738.448
Denmark	1990	100	100	100	100
	2000	122.8657	184.9169	314.2634	173.5555
	2016	147.9736	165.2972	9205.181	1962.88
Finland	1990	100	100	100	100
	2000	115.413	119.649	787.7379	250.7252
	2016	158.114	125.0416	5667.85	1253.447
France	1990	100	100	100	100
	2000	122.8099	128.2474	197.8118	138.8978
	2016	148.5164	107.6516	1109.906	332.6213
Germany	1990	100	100	12.04712	100
	2000	124.28	95.96779	131.6105	120.0837
	2016	153.87	139.7974	795.7659	279.4346
Greece	1990	100	100	100	100

	2000	122.7482	111.0655	379.8023	171.8225
	2016	133.854	151.3695	2016.171	513.8205
Hungary	1990	47.97556	100	100	100
	2000	102.1316	128.5011	84.84558	103.9483
	2016	145.7535	142.0959	292.084	174.2881
Indonesia	1990	100	100	100	100
	2000	154.1491	142.2535	193.9397	159.7281
	2016	301.7031	643.0683	316.7698	372.9895
India	1990	100	100	100	100
	2000	159.5596	143.1303	186.4637	161.6545
	2016	383.6353	248.9659	568.5448	393.6833
Israel	1990	100	100	100	100
	2000	130.9104	100.5253	119.9968	122.6507
	2016	166.5474	131.3612	135.3846	153.2776
Italy	1990	100	100	100	100
	2000	117.2482	119.1424	1680.745	430.3263
	2016	120.4777	88.17835	10610.32	2211.986
Japan	1990	100	100	100	100
	1999	121.2269	82.26092	129.3225	115.0528
	2000	125.3366	94.47645	131.9232	120.4819
	2016	155.7402	95.74552	173.1017	147.2135
Korea	1990	100	100	100	100
	2000	190.2397	99.8213	278.7704	189.8622
	2016	344.0779	20.2598	1007.253	411.9493
Malaysia	1990	100	100	100	100
	2000	125.8818	166.0466	304.4778	169.634
	2016	271.5446	250.6619	505.2683	314.1128
Morocco	1990	100	100	100	100
	2000	125.6389	140.3883	316.5794	166.7769
	2016	216.4499	136.5639	620.6133	281.3054
Netherland	1990	100	100	100	100
	2000	128.1328	122.6619	143.7224	130.1566
	2016	155.0342	123.2585	1793.389	476.3499
Pakistan	1990	100	100	100	100
	2000	115.1129	117.9332	159.6369	124.5817
	2016	178.2278	235.3397	222.6484	198.5343
Paraguay	1990	100	100	100	100
	2000	103.0237	272.5246	300.3829	176.3958
	2016	158.4308	303.0609	567.9942	269.2695
Portugal	1990	100	100	100	100
	2000	141.8784	139.2582	248.87	162.7527

	2016	161.4597	97.15675	2595.874	635.482
Srilanka	1990	100	100	100	100
	2000	151.6143	146.8857	128.7638	146.0985
	2016	314.5806	502.4401	307.4047	350.7173
South Africa	1990	100	100	100	100
	2000	86.01482	99.22316	217.3979	114.9331
	2016	124.5353	108.8999	316.6591	159.833
Sweden	1990	100	100	100	100
	2000	119.3679	187.995	105.6818	130.3561
	2016	154.1128	245.7797	1673.892	476.4021
UK	1990	100	100	100	100
	2000	125.7536	126.5376	137.1692	128.1935
	2016	162.7954	143.5959	212.0367	168.8038
USA	1990	100	100	100	100
	2000	125.5914	17.33244	162.3532	111.2919
	2016	153.9363	223.2578	236.9787	184.4091
Turkey	1990	100	100	100	100
	2000	132.4232	89.80467	345.2959	166.474
	2016	245.8683	310.8076	1100.011	429.6847
Nigeria	1990	100	100	100	100
	2000	66.46463	100.9733	108.5608	81.78559
	2016	148.2338	100.9134	306.3106	170.3851

Source : Author's Computation .

APPENDIX TABLE 3: Trends in Composite well being (using geometric mean)

Country	Year	PWBI with LEI	Future well being index	Social security Index	CLIE geo mean
Argentina	1990	100	100	100	100
	2000	173.9629	107.164	266.0486	170.5383798
	2016	243.6896	120.4854	295.5747	205.5004899
Australia	1990	100	100	100	100
	2000	123.8964	119.7467	173.3516	137.0093079
	2016	167.4296	149.471	409.7153	217.2486671
Bangladesh	1990	100	100	100	100
	2000	132.8964	268.6913	237.5395	203.9392752
	2016	261.0139	512.9833	877.9862	489.8745316
Bolivia	1990	100	100	100	100
	2000	132.5116	115.239	358.4508	176.2358761
	2016	225.4845	158.7562	589.0673	276.2723804
Canada	1990	100	100	100	100
	2000	110.1477	118.1279	139.352	121.9402273
	2016	145.1254	121.261	16.0707	65.63969006
Cameroon	1990	100	100	100	100
	2000	93.86352	99.54659	78.99196	90.37230869
	2016	133.9193	143.9447	99.25766	124.1464426
China	1990	100	100	100	100
	2000	571.7262	244.948	346.3584	364.6945474
	2016	2090.702	68.12334	2352.009	694.5055663
Denmark	1990	100	100	100	100
	2000	122.8657	184.9169	314.2634	192.56044
	2016	147.9736	165.2972	9205.181	608.3600854
Finland	1990	100	100	100	100
	2000	115.413	119.649	787.7379	221.572161
	2016	158.114	125.0416	5667.85	482.1117007
France	1990	100	100	100	100
	2000	122.8099	128.2474	197.8118	146.0532992
	2016	148.5164	107.6516	1109.906	260.8316871
Germany	1990	100	100	12.04712	100
	2000	124.28	95.96779	131.6105	116.217745
	2016	153.87	139.7974	795.7659	257.7188003
Greece	1990	100	100	100	100
	2000	122.7482	111.0655	379.8023	173.0018012

	2016	133.854	151.3695	2016.171	344.4020316
Hungary	1990	47.97556	100	100	100
	2000	102.1316	128.5011	84.84558	103.6490612
	2016	145.7535	142.0959	292.084	182.2088761
Indonesia	1990	100	100	100	100
	2000	154.1491	142.2535	193.9397	162.0156004
	2016	301.7031	643.0683	316.7698	394.6331494
India	1990	100	100	100	100
	2000	159.5596	143.1303	186.4637	162.0875365
	2016	383.6353	248.9659	568.5448	378.6817682
Israel	1990	100	100	100	100
	2000	130.9104	100.5253	119.9968	116.4500555
	2016	166.5474	131.3612	135.3846	143.6122165
Italy	1990	100	100	100	100
	2000	117.2482	119.1424	1680.745	286.3462014
	2016	120.4777	88.17835	10610.32	483.0577633
Japan	1990	100	100	100	100
	1999	121.2269	82.26092	129.3225	108.8484529
	2000	125.3366	94.47645	131.9232	116.0310371
	2016	155.7402	95.74552	173.1017	137.1745361
Korea	1990	100	100	100	100
	2000	190.2397	99.8213	278.7704	174.2838022
	2016	344.0779	20.2598	1007.253	191.4888611
Malaysia	1990	100	100	100	100
	2000	125.8818	166.0466	304.4778	185.3174051
	2016	271.5446	250.6619	505.2683	325.2000027
Morocco	1990	100	100	100	100
	2000	125.6389	140.3883	316.5794	177.4104658
	2016	216.4499	136.5639	620.6133	263.7372519
Netherland	1990	100	100	100	100
	2000	128.1328	122.6619	143.7224	131.2093665
	2016	155.0342	123.2585	1793.389	324.8176216
Pakistan	1990	100	100	100	100
	2000	115.1129	117.9332	159.6369	129.4089767
	2016	178.2278	235.3397	222.6484	210.5862964
Paraguay	1990	100	100	100	100
	2000	103.0237	272.5246	300.3829	203.5507786
	2016	158.4308	303.0609	567.9942	301.0032523
Portugal	1990	100	100	100	100
	2000	141.8784	139.2582	248.87	170.0473516
	2016	161.4597	97.15675	2595.874	344.0383672

Srilanka	1990	100	100	100	100
	2000	151.6143	146.8857	128.7638	142.0706934
	2016	314.5806	502.4401	307.4047	364.9014265
South Africa	1990	100	100	100	100
	2000	86.01482	99.22316	217.3979	122.87982
	2016	124.5353	108.8999	316.6591	162.5438907
Sweden	1990	100	100	100	100
	2000	119.3679	187.995	105.6818	133.3556125
	2016	154.1128	245.7797	1673.892	398.7531078
UK	1990	100	100	100	100
	2000	125.7536	126.5376	137.1692	129.7175862
	2016	162.7954	143.5959	212.0367	170.5029089
USA	1990	100	100	100	100
	2000	125.5914	17.33244	162.3532	70.70119878
	2016	153.9363	223.2578	236.9787	201.1958421
Turkey	1990	100	100	100	100
	2000	132.4232	89.80467	345.2959	160.1344566
	2016	245.8683	310.8076	1100.011	438.0567536
Nigeria	1990	100	100	100	100
	2000	66.46463	100.9733	108.5608	89.98221471
	2016	148.2338	100.9134	306.3106	166.0935226

Source : Author's Computation .