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Article

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The Role of Environmental Conditions and Purchasing Power Parity in Determining Quality of Life among Big Asian Cities

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ABSTRACT

This article has examined the role of environmental conditions and purchasing power parity in deciding the quality of life among big Asian cities. The study has constructed an index for quality of life with the help of housing, crime rates, death rate, average life expectancy, environmental degradation, and level of education. Quality of life has been selected as the dependent variable and the level of pollution, availability of health care facilities, local purchasing power, availability of groceries, level of democracy, cost of living, restaurants, level of traffic, and level of rents are selected explanatory variables. For empirical analysis, this study uses data for the years 2017, 2018, and 2019. The estimated results show that pollution has a negative and significant impact on the quality of life in the case of Asian cities. Local purchasing power has a positive and significant relationship with the quality of life in the cities of Asia. Groceries and democracy are very important parts of the daily life of human beings but they have insignificant impacts on the quality of life in Asian cities. Restaurants have a positive and significant impact on quality of life. This study finds that level of traffic and the level of rent have a negative and significant impact on the quality of life in the case of Asian cities. The overall results conclude that selected indicators play a significant role in determining the quality of life in Asian cities.

Keywords: Quality of Life, Environmental Conditions, Purchasing Power Parity
JEL Classifications: E31, J17, R11

1. INTRODUCTION

The most recent, Sustainable Development Goals (SDGs) put special attention on the quality of life among the nations. SDGs encourage national governments, international institutions, and civil societies to help in achieving the targeted quality of life. Following, the famous slogan of UNO "health and education for all", the World Bank and the UNO publish different reports and articles related to the ranking of the quality of life among the countries and cities. The basis of every field of science is a better quality of life, but traditional societies forget this target of the human being (Kant, 1785). After the emergence of the UNO, quality of life gets special importance in the socioeconomic policies of each nation (McGillivray, 2007).

This general understanding of the quality of life explains that an individual or social group should work for the fulfillment of physiological needs. There are some main indicators for the measurement of quality of life i.e. rate of infant mortality, the mean life expectancy, sanitary facilities, percent of people having safe drinking water, and mean daily calorie supply per person (Diener and Diener, 1995). The quality of life has also some subjective as well as some objective traits. The best traditional tools for measuring the quality of life at the macro level are the gross domestic product and at the micro level per capita income. Tobin and Nordhaus (1972), the United Nations Development Program (1990), and Anand and Sen (1992) mention that traditional tools for measuring the quality of life are unable to explain the actual socioeconomic conditions of the individual household. Tobin and Nordhaus (1972) point out that net economic welfare is the best criterion for the measurement of quality of life because it is based on the aggregate consumption of the nation. International Labor Organization (1976) has developed physical quality of life index. In this study, we have constructed an index of quality of life (availability of housing, crime rates, death rate, average life expectancy, environmental degradation, and level of education) with the help of principle components analysis.

The idea of environmental conditions related to the quality of life has a wider scope, and this depends on the quality of mediums (e.g. soil, water, and air). The quality of the environment is considered very important to the quality of human life because human health is greatly impacted by the existing physical conditions of the environment (Coan and Holman, 2008, Kahn, 2002). Extreme environmental conditions (earthquakes, cyclones, floods, droughts, and volcanic eruptions) have seriously damaged the physical and mental health of human beings (Ahmad and Yamano, 2011). It has been observed empirically that environmental conditions strongly impact the quality of life (Diener and Suh, 1997, UNECE, 2009). The quality of the environment has intrinsic value to the human being (Brajša-Žganec et al., 2011). The preserving environment is one of the most important factors in ensuring and the preservation of well-being over time (Liere and Dunlap, 1980). Thus, the policies related to the environment have a critical role to deal with global health priorities, as well as improving environmentally responsible behavior and lives (Felix and Garcia-Vega, 2012).

In the frictionless world, the prices of the same goods should be the same across different locations. The law of the one price is considered an important determinant of quality of life. If the prices differ in two locations, excess demand and supply in the cheap and expensive locations would ultimately equalize them. The cross-location and international prices infer that the price dispersion changes little over time, but the international price declines over time and has a deep-rooted impact on quality of life (Reif et al., 2021). In recent years, price convergence among the regions has fascinated policymakers to check its impact on different socioeconomic factors. As this refers to the convergence of quality of life among the regions and nations at the same time. The differences between the prices in the two countries are temporary if the prices are measured with the same exchange rate (Pires-Júnior et al., 2018).

The role of wages and rents in allocating workers' locations, also decide the quality of life within that locations. If the amenity of production and the wage gradient is unclear while the rent gradient is positive, this would produce an unclear level of quality of life. Hence, the housing market and the non-traded good price level are also unclear (Roback, 1982). The long-run behavior of the cost of a given consumption basket at each point in time to document the behavior of absolute price levels (Devereux and Griffith, 2003). Average relative price variability has a significant impact on the quality of life in the same region (Chmelarova and Nath, 2008). Price level convergence is referred to as the overall consumer price index as well as the index without housing prices (Dreger and Kosfeld, 2010). The overwhelming evidence in support of price level convergence over time in major cities in the US (Huang et al., 2011). Border plays an important role in the variations of prices of similar goods and services in different cities, but the variations in the prices are higher in the cities located in different countries than in the cities in the same country (Engel and Rogers, 1994). Based on the law of one price, purchasing power parity states that exchange rates do not affect relative goods, relative inflation will be proportional to the exchange rates, and there is weak evidence of purchasing power parity and quality of life (Serletis and Gogas, 2003). This study has examined the role of environmental conditions and purchasing power parity on quality of life in the case of selected Asian cities.

2. LITERATURE REVIEW

There are extensive theoretical and empirical studies that investigate the link between environmental conditions and quality of life, purchasing power, and quality of life. Here, the most relevant studies have been selected for the literature review. Quality of life refers to reasonable and good living conditions (Cella, 1992; Felce and Perry, 1995; Sarvimäki and Stenbock-Hult, 2000; Kelley-Gillespie, 2009; Lagadec et al., 2018; Ohta et al., 2021; Solberg et al., 2022). Good and reasonable living conditions are comprised of material sources and subjective perceptions e.g. feelings and emotions. Ventegodt et al., (2003) mentioned that quality of life has its integrated attributes. This study provides three notions of quality of life i.e., objective quality of life, existential quality of life, and subjective quality of life.

Environmental conditions being the objective indicators i.e. the concentrations and emissions of various pollutants should be combined here with indicators based on people's subjective perceptions of the quality of the environment where they live. As in the case of other subjective data, indicators of satisfaction with environmental quality may be affected by cultural biases and other limits that could affect cross-country comparisons, so these indicators are excluded from the assessment of environmental indicators of quality of life (Liao, 2009). Local environmental conditions have a direct influence on the quality of life in general and human health in specific. Better quality of the environment is a big foundation for human satisfaction and improved mental health, and it permits individuals to recover from the stresses of everyday life and perform physical activities. Sufficient availability and access to physical resources e.g., green spaces, forests, and rivers contribute to the quality of life. Economies rely not only on healthy and productive workers but also on natural resources like water, timber, fisheries, plants, and crops (Zheng, 2010). The consumption of environmental services and amenities has a direct impact on quality of life, and conversely, the quality of these services is affected by human behavior. Environmentally responsible behavior through activities such as saving energy, using renewable resources and sustainable consumption is the main driver of the quality of environmental services provided (Osbaldiston and Sheldon, 2003, Thogersen, 2006).

Following the theories related to the quality of life, the wider spectrum incorporates the subjective and objective realm of living (Berleant, 1997; Ya-Wen and Hsiao, 2006; Ventegodt et al., 2003). The process considers diverse dimensions ranging from economic status to personal security (Durand, 2015; Balestra and Tonkin, 2018). There has been quite a bit of recent scholarly effort aiming to understand the relationship between economic status and quality of life (Cella, 1994; Smith, 1999; Tang, 2007; Kautonen et al., 2017). Purchasing power is one of the practical indicators representing economic condition (Guesalaga and Marshall, 2008; Rogoff, 1996). Frenkel (1981) studies the trend of purchasing power parities among the US dollar and France Franc for May 1979–July 1979. The study finds that during the 1970 s currency rate of exchange between the USA dollar and the France Franc has fallen. The study concludes that the currency rate of exchange and level of price cannot be separated from each other, so any variation in the rate of exchange will impact the domestic price level and lifestyle of the masses. Taylor and Brown (1988) investigates the long-run trend of purchasing power parity with the help of Co-integration techniques among five major exchange currencies from 1973 to 1985. Seasonally unadjusted monthly based data has been used in this study. The outcomes of this study are against the traditional hypothesis of purchasing power parity, there is no integration has been found among the major exchange currency during the selected period. This study concludes that proportionality exists among the relative prices ad exchange rates over the long run.

Apte et al. (1994) examine the relative purchasing power parity monthly. The data have been used in this study post-1972. The authors argue that martingale behavior deviates from the purchasing power parity. This study uses all information implicit in all cross-rates too. Secondly, an instrumental variable that is specifically designed to cope with lead-and-lag effects in non-traded versus traded-goods inflation. Our estimates indicate that most lead-and-lag effects seem to occur within a 6-month window. Engel and Rogers (2001) explore the failures of the law of one price across European cities. The focus of this study is to explore the local currency pricing and floating exchange rates for the international failures of the law of one price. This study is paying more attention to the local currency instead of previous studies. This study derives an expression for the variance of the relative prices across locations in terms of nominal exchange rate and transportation costs. It is concluded that the border effects are coming from the local currency pricing with the fluctuating nominal exchange rate. The border effect has a positive and significant effect on real exchange variations.

Silvester et al. (2004) investigate the purchasing power in the panel of cities. This study uses a long-time span of panel data and the short-run deviations measured by the half-lives, thus, the results show non-rejection of the purchasing power parity. In highly integrated economies, real factors may be due to a slow rate of convergence to a common price index. Coakley et al. (2005) investigate the first test of purchasing power parity and the theory of general relativity. The study finds that inflation differentials reflect, on average one-for-one in long-run nominal exchange rate reduction that general relative purchasing power parity holds.

Reif and Rumler (2014) examine the price dispersion in the Euro area. For this purpose, the disaggregated price data set has been taken from the AC Nielsen to the euro system. The study concludes that the price dispersion moves together closely in locations that are closer to each other, but the price dispersion across the cross-country price dispersion is by an order of magnitude larger than within-country price dispersion even after controlling for product heterogeneity. Tax rates, income level, and consumption intensities could be explained as a large part of the cross-country price difference. It also indicates that price dispersion in the Euro area has declined since the start of the monetary union. Beko and Kavkler (2019) reexamining the purchasing power parity for small central and Eastern European economies. The results show that even after considering the nonlinear reversion of real exchange rates of choosing central and Eastern economies, there is no confirmed validity of purchasing power parity. The non-stationarity hypothesis of the real exchange rate is rejected in the case of 3 countries out of 10. This study gives the direction for further research to point out the determinants that cause the violation of the purchasing power parity concepts in the Central Eastern European economies.

3. THE MODEL

Quality of life has been the prime objective of all human activities (Shin and Johnson, 1978; Elizur and Shye, 1990; McKee-Ryan et al., 2005). Simply, quality of life presents the overall situation of peoples' lives in the country (McGillivray, 2007). Somehow, this general understanding of the quality of life is unable to explain an individual or any particular social group's living standard. Literature (Headey and Wearing, 1989; Costanza et al., 2007; Renwick et al., 2017; Mouratidis, 2021) has highlighted that there are some objective as well as some subjective traits attached to the quality of life. Thus, for this purpose, the selection of key indicators and their assigned weight matter a lot. For a couple of years, there are some measures have been used for judging the quality of life (Veenhoven, 1993). The best traditional tools for measuring the quality of life at the macro level are the gross domestic product and at the micro level per capita income. Nordhaus and Tobin (1973), the United Nations Development Program (1990), and Anand and Sen (1992) mention that traditional tools for measuring the quality of life are unable to explain the actual socioeconomic conditions of the individual household. Quality of life directly explains the participation of an individual in the socioeconomic activities of the community (Coleman and Rainwater, 1978; Rainwater, 1990; Sen 1992). Sen (1992) further points out that aggregate household consumption is not quality of life, whereas it is the ability to consume and the capability to participate in socio-economic activities that are called real quality of life. United Nations Development Program (1990) has developed a comprehensive index for measuring the quality of life with the help of health, education, and income. Following the methodologies of Duesenberry (1949), Scitovsky (1976), Layard (1980), Frank (1985), Schor (1998), Cooper et al. (2001), Ravallion and Lokshin (2001), Ferrer-I-Carbonell (2002), Ali (2015), Ali and Rehman (2015), Ali and Bibi (2017), and Ali (2018) we have constructed an index of quality of life in the case of selected Asian cities. The functional form of the model becomes as:

$$QL_i = f\,(PI_i, HCI_i, PPI_i, GI_i, DM_i, CLI_i, RII_i, TI_i, RI_i) \quad (1)$$

QL= Quality of life index has been constructed with the help of availability of housing, crime rates, death rate, average life expectancy, environmental degradation, and level of education by using Principle Component Analysis (PCA).
PI = level of pollution (CO_2 emissions)
HCI = availability of health care facilities (number of hospitals, doctors, nurses, hospitals beds, lady health workers, etc.)
PPI = local purchasing power (Local Purchasing Power shows relative purchasing power in buying goods and services in a market)
GI = grocery index comprised of availability of necessary grocery items
DM= democracy (measured with a dummy variable, 1 for democracy and 0 otherwise)
CLI= cost of living (the prices of food, shelter, transportation, energy, clothing, healthcare, childcare, etc.)
RII = availability of restaurants
TI= availability of transportation
RI= housing rent

To examine the elasticity of the explanatory variables to the dependent variable, the econometric model of the study becomes as:

$$QL_i=A+\beta_1 PI_i+\beta_2 HCI_i+\beta_3 PPI_i+\beta_4 GI_i+\beta_5 DM_i+\beta_6 CLI_i+\beta_7 RII_i+\beta_8 TI_i+\beta_9 RI_i+U_i \quad (2)$$

All the variables explained above expect A and U,
A=constant intercept
U=error term i.e. white noise having zero mean and constant variance

In this study, cross-sectional data from the years 2017, 2018, and 2019 have been used. The data of selected Asian cities have been taken from the World Bank and some national databases of each country. 42 cities of Asian countries have been collected for selected: Dubai (UAE), Tokyo (Japan), Singapore (Singapore), Bangalore (India), Pune (India), Istanbul (Turkey), Kuala Lumpur (Malaysia), Chennai (India), Delhi (India), Mumbai (India), Bangkok (Thailand), Tehran (Iran), Kolkata (India), Shanghai (China), Doha (Qatar), Hong Kong (Hong Kong), Hyderabad (India), Ankara (Turkey), Beirut (Lebanon), Jakarta (Indonesia), Tbilisi (Georgia), Manila (Philippines), Amman (Jordan), Riyadh (Saudi Arabia), Bursa (Turkey), Taipei (Taiwan), Seoul (South Korea), Tel Aviv-Yafo (Israel), Izmir (Turkey) Almaty (Kazakhstan), Yerevan (Armenia), Beijing (China), Karachi (Pakistan), Ho Chi Minh City (Vietnam), Colombo (Sri Lanka), Mangalore (India), Muscat (Oman), Gurgaon (India), Baku (Azerbaijan), Lahore (Pakistan), Ahmedabad (India) and Hanoi (Vietnam).

4. RESULTS AND DISCUSSION

This section consists of a discussion and estimated results that how selected indicators can impact the quality of life in the selected cities of Asia. Quality of life is taken as an explained variable, whereas traffic, the cost of living, rent, grocery, restaurant, local purchasing power parity, pollution, health care, and democracy have been used as independent variables. Appendix Table A presents the descriptive statistic of the selected variables, the results of the descriptive show the mean, standard deviation, minimum, maximum, Skewness, Kurtosis, and Jarque-Bera values of explained as well as explanatory variables. Based on the estimated results, all of our selected variables have reasonable intertemporal properties to estimate the regression analysis. The estimated results of correlation have been given in appendix Table B. The results show that most selected variables have a significant relationship with each other, but there is no higher correlation which creates the issue of multicollinearity among our decided regressors.

Pollution is a major risk contributor to human health (McKenzie et al., 2012; Audi and Ali, 2018; Huang et al., 2018; Rinklebe et al., 2019; Beni and Esmaeili, 2020). Different human activities produce different gases (sulfur oxides, nitrogen oxides, carbon monoxide, carbon dioxide, volatile organic compounds, particulate matter, chlorofluorocarbons, and ammonia) which hurt human health (WHO, 2002; Cohen et al., 2005; Sadalla, 2005; Mathew et al., 2013). Our estimated results of regression for the years 2017, 2018, and 2019 have been given in Table 1. The outcomes present that pollution level has a negative and significant influence on the quality of life in Asia cities. The rising level of pollution creates more chances of different diseases i.e. respiratory, lung and skin cancer, and asthma, etc., (Sadalla, 2005; Pruss-Ustun and Corvalán, 2006). Under such an environment, there are more chances of children and adult respiration (WHO, 2014 and CDC, 2010). About 5% of lung cancer has been attributed to pollution and it has a continuously rising trend (WHO, 2002; Cohen et al., 2004). Exposures to pollution accounted for approximately 2 % of the global cardiopulmonary disease burden (Cohen et al., 2004; WHO, 2002). Empirics show that pollution is estimated to be responsible for about 3% of adult cardiopulmonary disease mortality; about 5% of the trachea, bronchus, and lung cancer mortality; and about 1% of mortality in children from acute respiratory infection in urban areas worldwide (Cohen et al., 2005). Thus, specifically, the rising level of pollution reduces the quality of life in a nation and a city in general. Our results reveal that a 1% rise in the pollution level, (−0.917000) %, (−0.672991) % and (−0.780301) % fall happened in the quality of life in Asian cities during the years 2017, 2018, and 2019. Literature from the last three decades (Van Aardenne et al., 1999; Brunekreef and Holgate, 2002; Sadalla, 2005; Bell et al., 2008; Ali and Audi, 2016; Audi and Ali, 2016; Ali et al., 2021) show that pollution contributes to illness and death in all age groups, but the association between child death rate and pollution is very strong.

The availability of health care facilities will make the citizen of the nation more assured to get the health services they needed. Better quality of life is directly and indirectly attached to health care standards (Testa and Nackley, 1994; Ferrans et al., 2005; Karimi and Brazier, 2016), as by keeping the public health status promotive, rehabilitative, curative, and preventive, we may have better health outcomes (Engineer et al., 2008; De Mello and Pisu, 2009; Todaro and Smith, 2011; Craigwell, et al., 2012). Our results for the year 2017 show that there is a positive but insignificant link existed between health care

Table 1: Regression outcomes-year

Variables	Dependent variable: QL					
	Year-2017		Year-2018		Year-2019	
	Coefficient	Std. error	Coefficient	Std. error	Coefficient	Std. error
PI	−0.917000***	0.324959	−0.672991**	0.309342	−0.780301***	0.147959
HCI	0.470872	0.499288	0.931557**	0.410969	0.853693***	0.274245
PPI	0.265952*	0.135231	0.478234***	0.163878	0.466222***	0.091359
GI	0.652375	1.203359	0.288499	1.019981	−1.443005***	0.469808
DM	−27.02107	17.53992	−18.93161	14.01571	4.678003	6.718584
CLI	−1.687793	1.814835	−1.185922	1.567984	1.713598**	0.678702
RII	1.481704*	0.813700	1.427618*	0.753392	−0.037075	0.345602
TI	−0.209172**	0.076728	−0.194604***	0.065118	−0.178981***	0.038908
RI	−0.959136***	0.478294	−1.120078**	0.421298	−0.755148***	0.248177
C	198.0765	58.51343	125.9796	43.36071	115.0171	24.93568
R-squared	0.645458		0.719446		0.890869	
Adjusted R-squared	0.531499		0.642932		0.860176	
S.E. of regression	27.58177		24.74640		12.25112	
Sum squared resid	21301.12		20208.69		4802.874	
Log likelihood	−174.1693		−193.2967		−159.1207	
F-statistic	5.663911		9.402724		29.02499	
Prob (F-statistic)	0.000180		0.000001		0.000000	
Mean dependent var	104.6724		104.7119		115.8748	
S.D. dependent var	40.29644		41.41297		32.76304	
Akaike info criterion	9.693122		9.455661		8.053368	
Schwarz criterion	10.12407		9.865243		8.467099	
Hannan-Quinn criter.	9.846448		9.606702		8.205016	
Durbin-Watson stat	2.080583		1.781287		1.943951	

***1% significant level **5% significant level *10% significant level

and the quality of life in Asia. Better health care is attached to an educated population, skilled labor, and better medication. Based on the results, this reveals that Asian countries have more uneducated populations, unskilled labor, and less medication for the population. Moreover, Asian cities have poor health care systems i.e. medical staff is not competent and skilled, examining and reporting is slow, modern equipment for disease diagnosis is not available, the convenience of location for the center is not available, and huge and congested cities (Kaplan, 2003; Amaghionyeodiwe, 2009; Allin et al., 2010; and Kim et al., 2017). This creates an insignificant impact on the health care system for the masses of cities in Asia. So, deficiencies in health care are impacting badly the quality of life in the cities of Asia. But health care is positively and significantly influencing the quality of life during the years 2018 and 2019. Health care should be the basic priority of governments, so over time, Asian governments are paying much attention to the health of the masses.

Purchasing power is one of the practical indicators representing the economic condition of the masses of the country (Frenkel, 1978; Abuaf and Jorion, 1990; Rogoff, 1996; Taylor and Taylor, 2004), thus there is a strong relationship is existed between purchasing power and quality of life (Chin, 2001; Fisher, 2006; Tan et al., 2018). There are numerous studies (Costanza et al., 2007; Coletto et al., 2017; Greco and Polli, 2021) that highlighted that security perception has an important role in determining the level of human well-being. The purchasing power presents the currency value in terms of buying goods and services relative to other international currencies (Balassa, 1964; Taylor and Taylor, 2004; Haidar, 2011). The physical needs are the initial basis of the realization of quality of life (Hyde et al., 2003; Aivazian, 2016). The degree to which material needs are satisfied depends on the level of income (Diener and Oishi, 2000; Diener and Biswas-Diener, 2002). Purchasing power can be the indicator representing the level of income (Gelb and Diofasi, 2016; Chen and Hu, 2018; Bronchetti et al., 2019). Empiric shows that the purchasing power of Asian cities is increasing and it has a significant influence on the quality of life. The rising purchasing power has created a positive economic environment. Our results indicate that if the purchasing power increases, then the quality of life enhances because higher purchasing power enables individuals to buy more goods and services (De Estado, 2013). The results indicate that the 1% rise in the local purchasing power rises by (0.265952) %, (0.478234) %, and (0.466222) % during 2017, 2018, and 2019 respectively. So, empirics show that as purchasing power increases the people buying capacity of people, thus it raises the standard of living in the cities of Asia.

Following the objective factors of quality of life (Lawton et al., 1999; Ruggeri et al., 2001; Parra et al., 2010), the intake of calories is directly impacted by the availability of groceries (Schroeter et al., 2008; Valin et al., 2014). The poor population of developing countries has a low amount of groceries, hence there is a low level of quality of life (Zezza and Tasciotti, 2010; Popkin et al., 2012). Our estimated results for the years 2017 and 2018 show that in the case of Asian cities, there is a positive and insignificant impact of groceries on the quality of life. Although, groceries play a vital role in our basic life. If the quality of groceries is not good, then it depressed the quality of life among the masses (Drewnowski and Evans, 2001; Lim and Taylor, 2005; Rasheed and Woods, 2013). But during the year 2019 groceries have a negative and significant impact on quality of life. This also shows that the standard of groceries in Asian cities is very bad which is harmful to human life, thus groceries impact badly on the quality of life. The results illustrate that a 1% in the groceries −1.443005% fall is happening in the quality of life in the selected Asian cities.

Many social scientists believe that political rights have an intrinsic impact on the human well-being of individuals within a nation (Dasgupta, 1990; Diener and Suh, 2003; Tov and Diener, 2009; Murphy, 2014). Most of them are agreed that these are political and democratic rights that enable individuals to demand such public policies which enhance their welfare. Sen (1999) mentions that each society has faced a trade-off between adopting those institutions that preserve the essential political rights exercised by individuals to raise their quality of life, and demanding such institutions that reduce constraints to produce equal opportunities for all individuals to raise their wellbeing. Our estimated results show that democracy has an insignificant impact on the quality of life in Asian cities. Numerous studies (Kosack, 2003; Wong et al., 2011; Buhaug and Urdal, 2013) show that developing countries have weak institutions for political and democratic rights, thus, our finding has an insignificant relationship between democracy and quality of life among Asian countries. In a democracy, people have the right to select the legislature, they all have equal rights and the government is run under the rules and regulations. In Asia, democracy puts an insignificant effect on the quality of life of the general public (Bloom et al., 2001; Chang and Chu, 2006; Buhaug and Urdal, 2013). Democracy is attached to an educated population, in Asia, mostly the population is uneducated and they don't understand the true benefits of being democratic.

The cost of living is comprised of the price of food, childcare, healthcare, clothing, energy, etc. Quality of life is the direct link to the cost of living (Boskin, 1996; Bernanke and Mishkin, 1997; Piazzesi et al., 2007). The cost of living is negatively and insignificantly impacting the quality of life in the selected cities of Asia. Empiric shows that the cost of necessities has risen trend in Asia and the living standard is directly attached to the basic requirement of living human beings i.e. food, health, and housing, but in the case of Asia, most population have little or insufficient access to necessities (Johansen, 1993; Hossain and Fischer, 1995; Chang et al., 2013). Moreover, in Asian population have fewer earnings and an insufficient amount of money, which is required for maintaining the standard of living (Banerjee and Duflo, 2007; Saxena et al., 2007). This creates an insignificant link between the quality of life and the cost of living in Asia.

Availability of food is part and parcel of human life in general and quality of life in specific (Dasgupta and Weale, 1992; Rapley, 2003; Neulinger et al., 2020). Presently, the availability of food from outside the home has become an integral part of human life, and the demand for such food depends upon the availability of restaurants (McCracken and Brandt, 1987; Gustafsson et al., 2006; Mehta and Chang, 2008). It is the availability of restaurants in cities, which presents the eating habits of the inhabitants, and the quality of food and services given in the restaurants have a direct influence on the quality of life (Edwards and Hartwell, 2009; Williams, 2009). Our results show that restaurants are positively and significantly impacting the quality of life in selected cities. The results reveal that a 1% increase in restaurants brings a 1.481704% and 1.427618% rise in quality of life during the years 2017 and 2018 respectively. But restaurants have an insignificant impact on the quality of life during the year 2019. This insignificance of the relationship shows that during the year 2019, the quality of restaurants deteriorated which automatically impacted the quality of life in general.

The availability of transportation is one of the important factors in human personal life and business activities (Popova, 2017). The availability of transportation in its simple meaning is to carry passengers and freight from one place to another (Bruzzone et al., 2021). When transportation is considered from the quality of life frame, it simply refers to carrying individuals to their job, education, health centers, tourist places, etc., (Myers, 1988; Macke et al., 2018). The development of transportation, vehicles, and infrastructure and using new technologies in this sector speed up traveling facilities. But in the case of developing countries, the available transportation is insufficient to facilitate a huge amount of population (Suzuki et al., 2015; Demissie et al., 2016). Thus, our results show that the availability of transportation has a negative and significant impact on the quality of life in the case of Asian cities. The role of transportation in our daily life is very important because when cities have bad transportation and people spend more time in traffic, then they bear mental depression and lower quality of life (Downs, 2005; Novaco and Gonzalez, 2009). In Asia, there are big, old, and congested cities that hurt the quality of life in these cities (Glaeser, 2011; Wen et al., 2019). Moreover, mostly the cities of Asia do have not proper road infrastructure which creates traffic issues if the roads are blocked by traffic and the vehicles get stuck on the road and creating depression and noise pollution for the masses (Forman et al., 2003; WHO, 2012; Newman and Kenworthy, 2013; Cervero et al., 2017).

The availability of housing facilities covers both subjective and objective dimensions for quality of life. Housing facilities are directly linked with rent, thus, house rent is one of the important indicators of quality of life (Shapiro, 2006; McCrea et al., 2006; Aragonés et al., 2017). As a concern to objective dimensions, the fluctuations in house rent may have a significant impact on individual wealth and reduces his/her capacity to spend on health and education. Whereas, subjective dimensions of quality of life (i.e. mental health, etc.) are also impacted by the fluctuations in rent (McCrea et al., 2006). The drivers of housing rent potentially influence the quality of life, as house rent reflects the benefits derived from living in better areas in addition to possible wealth shocks (Glaeser and Gottlieb, 2009; Stone et al., 2015). Moreover, the exposure to better neighborhood conditions points towards a positive relationship between housing rent and quality of life irrespective of tenure status and could lead to a positive relationship with overall renters if living in better areas outweighs any negative wealth shocks (Byrne and Diamond, 2007; Rowley and Ong, 2012). But in the case of developing countries, most of the population has a weak shock absorption capacity, and any fluctuations in rent may disturb the overall quality of life (Collier et al., 2010; Barma et al., 2012). Our estimated results show that rent has a negative and significant impact on quality of life. The results explain that a 1% rise in housing rent −0.959136%,

−1.120078%, and −0.755148% fall has occurred in the quality of life during the years 2017, 2018, and 2019, respectively.

4.1. Comparative Analysis of Outcomes

We also make the comparative analysis based on our estimated results and discussion. The calculated outcomes of all the models explain that level of pollution is negatively and significantly influencing the quality of life (Audi and Ali, 2018; Huang et al., 2018; Rinklebe et al., 2019). Availability of health care facilities positively but insignificantly influenced the quality of life during the year 2017 but during the years 2018 and 2019, availability of health care facilities positively and significantly influenced the quality of life in the case of selected Asian cities. It shows that Asian cities are improving their health care system the raising their living quality (Neirotti et al., 2014). The calculated outcomes show that local purchasing power is positively and significantly influencing the quality of life during all the selected years 2017, 2018, and 2019. This shows that higher quality of life is attached to higher purchasing power parity (Taylor and Taylor, 2004). The outcomes of the years 2017 and 2018 show that the availability of groceries has a positive and insignificant impact on quality of life, but during the year 2019, the availability of groceries is negatively and significantly influencing the quality of life in Asian cities. This highlights that the quality and availability of groceries are very low, so there is an inverse link between the availability of groceries and the quality of life in selected Asian cities (Lucan and Mitra, 2012). The level of democracy negatively and insignificantly influenced living quality during the years 2017 and 2018 but during 2019 there is a positive but insignificant impact of the level of democracy on quality of life. This shows that the masses of Asian cities are unable to enjoy the true fruits of democracy (Kurlantzick, 2013). The cost of living has a negative and insignificant impact on the quality of in selected cities during the years 2017 and 2018, but the cost of living has a positive and significant impact on the quality of life in 2019. Restaurants have a positive and significant impact on quality of life during the year 2017 and 2018 but the restaurants are negatively and insignificantly influencing the quality of life in Asian cities during 2019. The calculated outcomes reveal that level of traffic is negatively and significantly influencing the quality of life in Asian cities during the years 2017, 2018, and 2019. This highlights that rising levels of traffic reduce human well-being (Douglas, 2012). The results show that level of rent put an inverse influence on living quality in Asian cities during the years 2017, 2018, and 2019. This shows that with the rising level of rents the people of selected cities are unable to get affordable residents for their families (Wu, 2004), thus, the overall quality of life is depressed in Asian cities.

4.2. Diagnostics Outcomes

The estimated outcomes of diagnostic tests have presented in appendices C, D, E, etc. Breusch-Godfrey's LM method of autocorrelation is used for checking the autocorrelation in the data series. Breusch-Pagan-Godfrey has been applied the checking the heteroskedasticity of the data. The results of Tables C-E show that there is no issue of serial correlation and heteroskedasticity in the selected data for the years 2017, 2018, and 2019 models. Thus, simple, ordinary least squares are the best fit for empirical analysis. Hansen (1996) points out that misspecification of the model and variables may generate biased outcomes that impact the predicting power estimated results. The most famous, CUSUM and CUSUMsq tests have been utilized for this checking the predicting power of the parameters. Brown et al. (1975) highlight that these methods provide facilities to check the gradual variations in the parameters. The expected value of recursive residual is zero leading to accepting the null hypothesis of parameter constancy is correct, otherwise not. This study has examined the determinants of quality of life in the case of selected Asian cities in 2017, 2018, and 2019. The plots of both CUSUM and CUSUMsq are shown in Figures 1-6 at a 5% level of significance. Results indicate that plots of both tests are within critical bounds at a 5% level of significance. This shows that our selected models are correctly specified in the case of selected Asian cities.

Figure 1: Year 2017

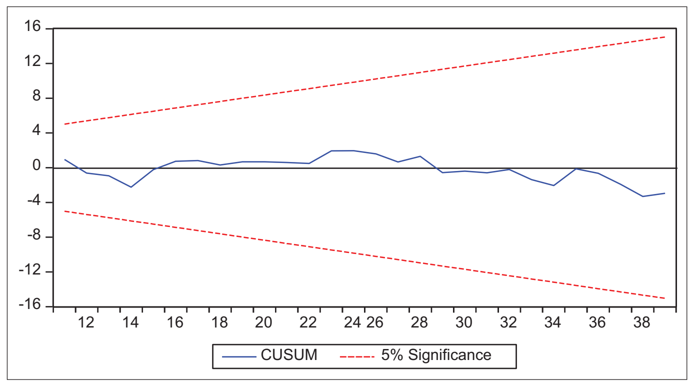


Figure 2: Year 2017

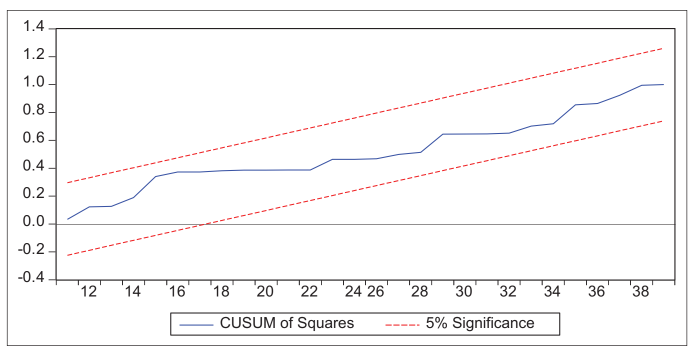


Figure 3: Year 2018

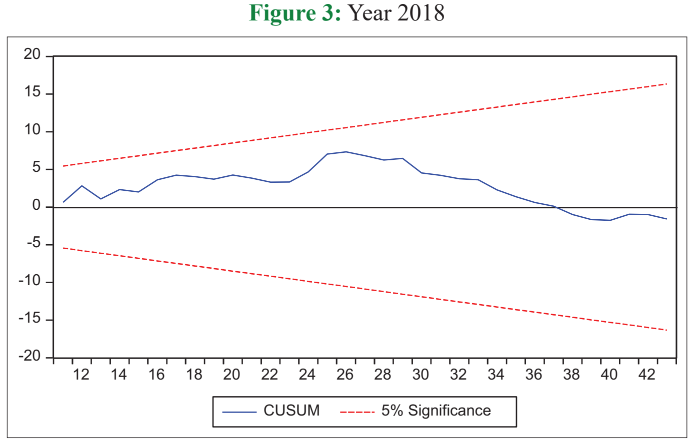


Figure 4: Year 2018

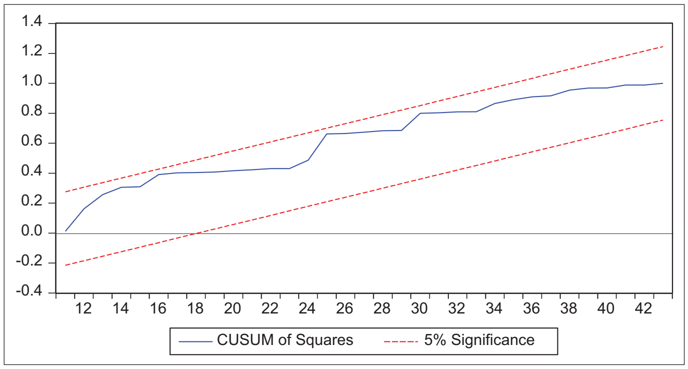


Figure 5: Year 2019

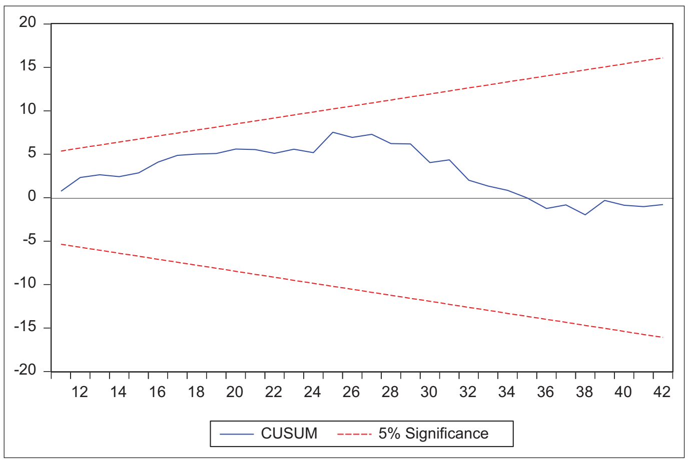
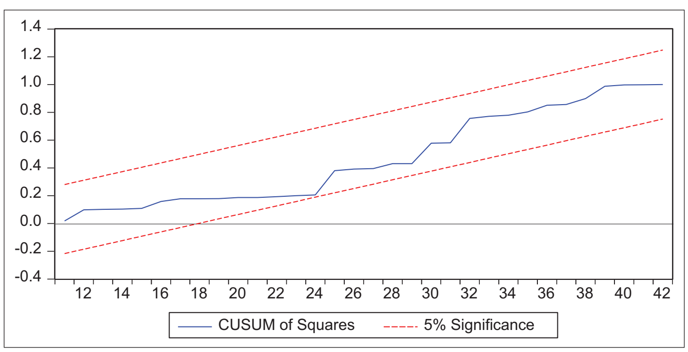


Figure 6: Year 2019



5. CONCLUSIONS POLICY SUGGESTIONS

The article has investigated the influence of environmental conditions and purchasing power parity on the quality of life in selected Asian cities. Quality of life index (availability of housing, crime rates, death rate, average life expectancy, environmental degradation, and level of education) has been taken as regressand. Level of pollution, availability of health care facilities, local purchasing power, availability of groceries, level of democracy, cost of living, restaurants, level of traffic, and level of rents are selected regressors. The empirical analysis is based on 42 cities in Asia for the years 2017, 2018, and 2019 have been selected. The results show that level of pollution, level of traffic, and level of rent has a negative and significant impact on the quality of life in Asian cities. Availability of health care facilities had an insignificant impact on quality of life during 2017, it has a positive and significant impact on quality of life during the years 2018 and 2019. The results show that local purchasing power has a positive and significant impact on the quality of life in the case of Asian cities. Availability of groceries has a positive but insignificant impact on quality of life during the years 2017 and 2018, but this relationship turns negative and significant during the year 2019. The level of democracy and the cost of living has an insignificant impact on the quality of life in Asian cities. Cost of living has a positive and significant impact on the quality of life of Asian cities during the year 2019. Restaurants have a positive and significant impact on quality of life but this relationship turns insignificant during the year 2019. The overall results conclude that selected independent variables play a significant role in determining the quality of life in Asian cities.

Based on estimated results, there are some policy suggestions drawn for improving the quality of life in Asian cities. Based on the results, it is suggested that Asian governments should take serious steps to reduce levels of pollution for attaining a higher level of quality of life. Health cares is one of the basic needs of the general public. So, if the health care system of selected cities can be improved a higher quality of life can be achieved. The purchasing power of the currency is directly attached to investment and the level of employment in the country. Thus, by enhancing purchasing power the overall higher quality of life in Asian cities can be attained. Moreover, the government provides charity funds and other monetary benefits to the people, which enhance the purchasing power of the masses. This study suggests that by lowering the cost of living, the level of quality of life can be increased. As with the higher cost of living, the people are unable to meet their necessities. For this purpose, governments of these cities provide subsidies on basic needs, so with the higher cost of living people can afford necessities. As restaurants have a positive and significant impact on quality of life, this reveals that for a higher quality of life the standard of restaurants can be improved. For the improvement of restaurants, the city government of selected cities should properly check the standards of restaurants. Although, numerous cities have separate departments for this purpose, and for the improvements of the restaurants these departments should improve their working efficiency. The quality of life environment is directly impacted by the quality of the environment, and the environment is directly impacted by the level of traffic. So, for the improvement in environmental quality, the level of traffic can be reduced. For this purpose, the governments of the selected cities can motivate their people to use public transport rather than private one, this will reduce the number of vehicles on the road and the level of environmental degradation comes down. Moreover, the fuel-efficient and environment-friendly technology of the vehicles should be encouraged and fuel inefficient, environmentally unfriendly, and outdated vehicles should be discouraged in Asian cities.

REFERENCES

Abuaf, N., Jorion, P. (1990), Purchasing power parity in the long run. The Journal of Finance, 45(1), 157-174.

Ahmad, N., Yamano, N. (2011), Carbon Dioxide Emissions Embodied in Goods and Services: Domestic Consumption versus Production. OECD Statistics Directorate Working Papers. Paris: OECD. [Forthcoming].

Aivazian, S.A. (2016), Quality of life and living standards analysis. In: Quality of Life and Living Standards Analysis. Germany: De Gruyter.

Ali, A. (2015), The Impact of Macroeconomic Instability on Social Progress: An Empirical Analysis of Pakistan. (Doctoral Dissertation, National College of Business Administration and Economics Lahore).

Ali, A. (2018), Issue of income inequality under the perceptive of macroeconomic instability: An empirical analysis of Pakistan. Pakistan Economic and Social Review, 56(1), 121-155.

Ali, A., Audi, M. (2016), The impact of income inequality, environmental degradation and globalization on life expectancy in Pakistan: An empirical analysis. International Journal of Economics and Empirical Research (IJEER), 4(4), 182-193.

Ali, A., Audi, M., Bibi, C., Roussel, Y. (2021), The impact of gender inequality and environmental degradation on human well-being in the case of Pakistan: A time series analysis. International Journal of Economics and Financial Issues, 11(2), 92-99.

Ali, A., Bibi, C. (2017), Determinants of social progress and its scenarios under the role of macroeconomic instability: Empirics from Pakistan. Pakistan Economic and Social Review, 55(2), 505-540.

Ali, A., Rehman, H.U. (2015), Macroeconomic instability and its impact on the gross domestic product: An empirical analysis of Pakistan. Pakistan Economic and Social Review, 285-316.

Allin, S., Grignon, M., Le Grand, J. (2010), Subjective unmet need and utilization of health care services in Canada: What are the equity implications? Social Science and Medicine, 70(3), 465-472.

Amaghionyeodiwe, L.A. (2009), Government health care spending and the poor: Evidence from Nigeria. International Journal of Social Economics, 36, 220-236.

Anand, S., Sen, A. (1994), Human Development Index: Methodology and Measurement. (Human Development Occasional Papers). New York: Human Development Report Office.

Apte, P., Kane, M., Sercu, P. (1994), Relative PPP in the medium run. Journal of International Money and Finance, 13(5), 602-622.

Aragonés, J.I., Amérigo, M., Pérez-López, R. (2017), Residential satisfaction and quality of life. In: Handbook of Environmental Psychology and Quality of Life Research. New York City: Springer International Publishing, p311-328.

Audi, M., Ali, A. (2017), Environmental degradation, energy consumption, population density and economic development in Lebanon: A time series analysis (1971-2014). Journal of International Finance and Economics, 17(1), 7-20.

Audi, M., Ali, A. (2018), Determinants of environmental degradation under the perspective of globalization: A panel analysis of selected MENA nations. Journal of Academy of Business and Economics, 18(1), 149-166.

Balassa, B. (1964), The purchasing-power parity doctrine: A reappraisal. Journal of political Economy, 72(6), 584-596.

Balestra, C., Tonkin, R. (2018), Inequalities in Household Wealth across OECD Countries: Evidence from the OECD Wealth Distribution Database. Paris, France: OECD.

Banerjee, A.V., Duflo, E. (2007), The economic lives of the poor. Journal of Economic Perspectives, 21(1), 141-168.

Barma, N., Kaiser, K., Le, T.M., editors. (2012), Rents to Riches?: The Political Economy of Natural Resource-led Development. Washington, D.C.: World Bank Publications.

Bekő, J., Kavkler, A. (2019), Do real exchange rates in small Central and Eastern European economies obey purchasing power parity? International Journal of Sustainable Economy, 11(2), 121-140.

Bell, B.S., Kanar, A.M., Kozlowski, S.W. (2008), Current issues and future directions in simulation-based training in North America. The International Journal of Human Resource Management, 19(8), 1416-1434.

Beni, A.A., Esmaeili, A. (2020), Biosorption, an efficient method for removing heavy metals from industrial effluents: A review. Environmental Technology and Innovation, 17, 100503.

Berleant, A. (1997), Living in the Landscape: Toward an Aesthetics of Environment. Theories of Contemporary Cultural. Kansas, United States: University Press of Kansas.

Bernanke, B.S., Mishkin, F.S. (1997), Inflation targeting: A new framework for monetary policy? Journal of Economic Perspectives, 11(2), 97-116.

Bloom, D.E., Craig, P.H., Malaney, P.N. (2001), The Quality of Life in Rural Asia. Philippines: Asian Development Bank.

Boskin, M.J. (1996), Toward a more Accurate Measure of the Cost of Living. Advisory Commission to Study the Consumer Price Index.

Brajša-Žganec, A., Merkaš, M., Šverko, I. (2011), Quality of life and leisure activities: How do leisure activities contribute to subjective well-being? Social Indicators Research, 102(1), 81-91.

Bronchetti, E.T., Christensen, G., Hoynes, H.W. (2019), Local food prices, SNAP purchasing power, and child health. Journal of Health Economics, 68, 102231.

Brown, R. L., Durbin, J., & Evans, J. M. (1975), Techniques for testing the constancy of regression relationships over time. Journal of the Royal Statistical Society: Series B (Methodological), 37(2), 149-163.

Brunekreef, B., Holgate, S.T. (2002), Air pollution and health. The Lancet, 360(9341), 1233-1242.

Bruzzone, F., Cavallaro, F., Nocera, S. (2021), The integration of passenger and freight transport for first-last mile operations. Transport Policy, 100, 31-48.

Buhaug, H., Urdal, H. (2013), An urbanization bomb? Population growth and social disorder in cities. Global Environmental Change, 23(1), 1-10.

Byrne, J.P., Diamond, M. (2007), Affordable housing, land tenure, and urban policy: The matrix revealed. Fordham Urban Law Journal, 34, 527.

Cella, D.F. (1992), Quality of life: The concept. Journal of Palliative Care, 8(3), 8-13.

Cella, D.F. (1994), Quality of life: Concepts and definition. Journal of Pain and Symptom Management, 9(3), 186-192.

Centers for Disease Control and Prevention (CDC). (2010), Vital signs: Colorectal cancer screening among adults aged 50-75 years-United States, 2008. MMWR Morb Mortal Wkly Rep, 59(26), 808-12.

Cervero, R., Guerra, E., Al, S. (2017), Beyond Mobility: Planning Cities for People and Places. Washington, D.C.: Island Press.

Chang, A., Chu, Y.H., Welsh, B. (2013), Southeast Asia: Sources of regime support. Journal of Democracy, 24(2), 150-164.

Chang, E.C., Chu, Y.H. (2006), Corruption and trust: Exceptionalism in Asian democracies? The Journal of Politics, 68(2), 259-271.

Chen, M., Hu, X. (2018), Linkage between Consumer price index and purchasing power parity: Theoretic and empirical study. The Journal of International Trade and Economic Development, 27(7), 729-760.

Chin, E.M.L.S. (2001), Purchasing Power: Black Kids and American Consumer Culture. Minnesota: University of Minnesota Press.

Chmelarova, V., Nath, H.K. (2008), Do Regions Matter for the Behavior of City Relative Prices in the US? Economics and International Business Working Paper No. SHSU_ECO_WP08-03, Sam Houston State University.

Coakley, J., Flood, R.P., Fuertes, A.M., Taylor, M.P. (2005), Purchasing power parity and the theory of general relativity: The first tests. Journal of International Money and Finance, 24(2), 293-316.

Coan, T.G., Holman, M.R. (2008), Voting green. Social Science Quarterly, 89(5), 1121-1135.

Cohen, J.A., Mannarino, A.P., Knudsen, K. (2004), Treating childhood traumatic grief: A pilot study. Journal of the American Academy of Child and Adolescent Psychiatry, 43(10), 1225-1233.

Cohen, L.H., Gunthert, K.C., Butler, A.C., O'Neill, S.C., Tolpin, L.H. (2005), Daily affective reactivity as a prospective predictor of depressive symptoms. Journal of Personality, 73(6), 1687-1714.

Coleman, R. P., Rainwater, L., & McClelland, K. A. (1979), Social standing in America: New dimensions of class. Taylor & Francis.

Coletto, M., Esuli, A., Lucchese, C., Muntean, C.I., Nardini, F.M., Perego, R., Renso, C. (2017), Perception of social phenomena through the multidimensional analysis of online social networks. Online Social Networks and Media, 1, 14-32.

Collier, P., Van Der Ploeg, R., Spence, M., Venables, A.J. (2010), Managing resource revenues in developing economies. IMF Staff Papers, 57(1), 84-118.

Cooper, C.L., Dewe, P.J., Dewe, P.J., O'Driscoll, M.P., O'Driscoll, M.P. (2001), Organizational Stress: A Review and Critique of Theory, Research, and Applications. Thousand Oaks, CA: Sage Publications.

Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., Snapp, R. (2007), Quality of life: An approach integrating opportunities, human needs, and subjective well-being. Ecological Economics, 61(2-3), 267-276.

Craigwell, R., Bynoe, D., Lowe, S. (2012), The effectiveness of government expenditure on education and health care in the Caribbean. International Journal of Development Issues, 11(1), 4-18.

Dasgupta, P. (1990), Well-being and the extent of its realisation in poor countries. The Economic Journal, 100(400), 1-32.

Dasgupta, P., Weale, M. (1992), On measuring the quality of life. World Development, 20(1), 119-131.

De Estado, C. (2013), Sala de lo contencioso administrativo, sección tercera. Sentencia Del, 6, 13-232.

De Mello, L., Pisu, M. (2009), The Effectiveness of Education and Health Spending among Brazilian Municipalities. OECD Economic Department Working Papers, 712. Paris, France: OECD Publishing.

Demissie, M.G., Phithakkitnukoon, S., Sukhvibul, T., Antunes, F., Gomes, R., Bento, C. (2016), Inferring passenger travel demand to improve urban mobility in developing countries using cell phone data: A case study of Senegal. IEEE Transactions on Intelligent Transportation Systems, 17(9), 2466-2478.

Devereux, M.P., Griffith, R. (2003), Evaluating tax policy for location decisions. International Tax and Public Finance, 10(2), 107-126.

Diener, E., Biswas-Diener, R. (2002), Will money increase subjective well-being? Social Indicators Research, 57(2), 119-169.

Diener, E., Diener, C. (1995), The wealth of nations revisited: Income and quality of life. Social Indicators Research, 36(3), 275-286.

Diener, E., Oishi, S. (2000), Money and happiness: Income and subjective well-being across nations. In: Culture and Subjective Well-Being. United States: MIT Press, p185-218.

Diener, E., Suh, E.M. (2003), 22-National differences in subjective well-being. In: Well-Being: The Foundations of Hedonic Psychology. New York: Russell Sage Foundation.

Diener, E.D., Suh, M.E. (1997), Subjective well-being and age: An international analysis. Annual Review of Gerontology and Geriatrics, 17(1), 304-324.

Douglas, I. (2012), Urban ecology and urban ecosystems: Understanding the links to human health and well-being. Current Opinion in Environmental Sustainability, 4(4), 385-392.

Downs, A. (2005), Still Stuck in Traffic: Coping with Peak-hour Traffic Congestion. Washington, D.C.: Brookings Institution Press.

Dreger, C., Kosfeld, R. (2010), Do regional price levels converge? Jahrbücher für Nationalökonomie und Statistik, 230(3), 274-286.

Drewnowski, A., Evans, W.J. (2001), Nutrition, physical activity, and quality of life in older adults: Summary. The Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 56(suppl_2), 89-94.

Duesenberry, J.S. (1949), Income, Saving, and the Theory of Consumer Behavior. Cambridge: Harvard University Press.

Durand, M. (2015), The OECD better life initiative: How's life? and the measurement of well-being. Review of Income and Wealth, 61(1), 4-17.

Elizur, D., Shye, S. (1990), Quality of work life and its relation to quality of life. Applied Psychology, 39(3), 275-291.

Engel, C., Rogers, J. (1994), Relative Returns on Equities in Pacific Basin Countries. Cambridge: National Bureau of Economic Research, Inc.

Engel, C., Rogers, J.H. (2001), Deviations from purchasing power parity: Causes and welfare costs. Journal of International Economics, 55(1), 29-57.

Engineer, A. (2008), The Rights of Women in Islam. Uttar Pradesh: Sterling Publishers Pvt. Ltd.

Felce, D., Perry, J. (1995), Quality of life: Its definition and measurement. Research in Developmental Disabilities, 16(1), 51-74.

Felix, R., Garcia-Vega, J. (2012), Quality of life in Mexico: A formative measurement approach. Applied Research in Quality of Life, 7(3), 223-238.

Ferrans, C.E., Zerwic, J.J., Wilbur, J.E., Larson, J.L. (2005), Conceptual model of health-related quality of life. Journal of Nursing Scholarship, 37(4), 336-342.

Ferrer-i-Carbonell, A. (2002), Income and Well-Being (No. 02-019/3). Tinbergen Institute Discussion Paper.

Fisher, I. (2006), The Purchasing Power of Money: Its' Determination and Relation to Credit Interest and Crises. New York: Cosimo, Inc.

Forman, R.T., Sperling, D., Bissonette, J.A., Clevenger, A.P., Cutshall, C.D., Dale, V.H., Winter, T.C. (2003), Road Ecology: Science and Solutions. Washington, D.C.: Island Press.

Frank, R.H. (1985), Choosing the Right Pond: Human Behavior and the Quest for Status. Oxford: Oxford University Press.

Frenkel, J.A. (1978), Purchasing power parity: Doctrinal perspective and evidence from the 1920s. Journal of International Economics, 8(2), 169-191.

Frenkel, J.A. (1981), The collapse of purchasing power parities during the 1970's. European Economic Review, 16(1), 145-165.

Gelb, A., Diofasi, A. (2016), What determines purchasing-power-parity exchange rates? Revue d Economie du Developpement, 24(2), 93-141.

Glaeser, E. (2011), Cities, productivity, and quality of life. Science, 333(6042), 592-594.

Glaeser, E.L., Gottlieb, J.D. (2009), The wealth of cities: Agglomeration economies and spatial equilibrium in the United States. Journal of Economic Literature, 47(4), 983-1028.

Greco, F., Polli, A. (2021), Security perception and people well-being. Social Indicators Research, 153(2), 741-758.

Guesalaga, R., Marshall, P. (2008), Purchasing power at the bottom of the pyramid: Differences across geographic regions and income tiers. Journal of Consumer Marketing, 25(7), 413-418.

Gustafsson, I.B., Öström, Å., Johansson, J., Mossberg, L. (2006), The five aspects meal model: A tool for developing meal services in restaurants. Journal of foodservice, 17(2), 84-93.

Haidar, J.I. (2011), Currency valuation and purchasing power parity. World Economics Journal, 12(3), 1-12.

Hansen, B. E. (1996), Inference when a nuisance parameter is not identified under the null hypothesis. Econometrica: Journal of the econometric society, 413-430.

Hartwell, H., Edwards, J. (2009), Descriptive menus and branding in hospital foodservice: A pilot study. International Journal of Contemporary Hospitality Management, 21(7), 906.

Headey, B., Wearing, A. (1989), Personality, life events, and subjective well-being: Toward a dynamic equilibrium model. Journal of Personality and Social Psychology, 57(4), 731.

Hossain, M., Fischer, K.S. (1995), Rice research for food security and sustainable agricultural development in Asia: Achievements and future challenges. GeoJournal, 35(3), 286-298.

Huang, H.C., Wang, C.W., Miao, Y.C. (2011), Securitisation of crossover risk in reverse mortgages. The Geneva Papers on Risk and Insurance-Issues and Practice, 36(4), 622-647.

Huang, Y., Chen, Q., Deng, M., Japenga, J., Li, T., Yang, X., He, Z. (2018), Heavy metal pollution and health risk assessment of agricultural soils in a typical peri-urban area in southeast China. Journal of Environmental Management, 207, 159-168.

Hyde, M., Wiggins, R.D., Higgs, P., Blane, D.B. (2003), A measure of quality of life in early old age: The theory, development and properties of a needs satisfaction model (CASP-19). Aging and Mental Health, 7(3), 186-194.

Johansen, F. (1993), Poverty Reduction in East Asia. World Bank Discussion Papers, United States: World Bank.

Kahn, M.E., Matsusaka, J.G. (1997), Demand for environmental goods: Evidence from voting patterns on California initiatives. The Journal of Law and Economics, 40(1), 137-174.

Kant, I. (1785), Von der Unrechtmäßigkeit des Büchernachdrucks. Berlinische Monatsschrift, 5, 403-417.

Kaplan, R.M. (2003), The significance of quality of life in health care. Quality of Life Research, 12(1), 3-16.

Karimi, M., Brazier, J. (2016), Health, health-related quality of life, and quality of life: What is the difference? Pharmacoeconomics, 34(7), 645-649.

Kautonen, T., Kibler, E., Minniti, M. (2017), Late-career entrepreneurship, income and quality of life. Journal of Business Venturing, 32(3), 318-333.

Kelley-Gillespie, N. (2009), An integrated conceptual model of quality of life for older adults based on a synthesis of the literature. Applied Research in Quality of life, 4(3), 259-282.

Kim, K.H., Kabir, E., Jahan, S.A. (2017), Exposure to pesticides and the associated human health effects. Science of the Total Environment, 575, 525-535.

Kosack, S. (2003), Effective aid: How democracy allows development aid to improve the quality of life. World Development, 31(1), 1-22.

Kurlantzick, J. (2013), Democracy in retreat: The revolt of the middle class and the worldwide decline of representative government. New Haven, Connecticut: Yale University Press.

Lagadec, N., Steinecker, M., Kapassi, A., Magnier, A.M., Chastang, J., Robert, S., Ibanez, G. (2018), Factors influencing the quality of life of pregnant women: A systematic review. BMC Pregnancy and Childbirth, 18(1), 455.

Lawton, M.P., Winter, L., Kleban, M.H., Ruckdeschel, K. (1999), Affect and quality of life: Objective and subjective. Journal of Aging and Health, 11(2), 169-198.

Layard, R. (1980), Human satisfactions and public policy. The Economic Journal, 90(360), 737-750.

Liao, P.S. (2009), Parallels between objective indicators and subjective perceptions of quality of life: A study of metropolitan and county areas in Taiwan. Social Indicators Research, 91(1), 99-114.

Liere, K.D.V., Dunlap, R.E. (1980), The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence. Public Opinion Quarterly, 44(2), 181-197.

Lim, K., Taylor, L. (2005), Factors associated with physical activity among older people-a population-based study. Preventive Medicine, 40(1), 33-40.

Lucan, S.C., Mitra, N. (2012), The food environment and dietary intake: Demonstrating a method for GIS-mapping and policy-relevant research. Journal of Public Health, 20(4), 375-385.

Macke, J., Casagrande, R.M., Sarate, J.A.R., Silva, K.A. (2018), Smart city and quality of life: Citizens' perception in a Brazilian case study. Journal of Cleaner Production, 182, 717-726.

Mathew, J., Goyal, R., Taneja, K.K., Arora, N. (2013), Environmental and occupational respiratory diseases-1057. Correlation between air pollution and respiratory health of school children in Delhi. World Allergy Organization Journal, 6(1), 55.

McCracken, V.A., Brandt, J.A. (1987), Household consumption of food-away-from-home: Total expenditure and by type of food facility. American Journal of Agricultural Economics, 69(2), 274-284.

McCrea, R., Shyy, T.K., Stimson, R. (2006), What is the strength of the link between objective and subjective indicators of urban quality of life? Applied Research in Quality of Life, 1(1), 79-96.

McGillivray, M. (2007), Human well-being: Issues, concepts and measures. In: Human Well-Being. London: Palgrave Macmillan, p1-22.

McKee-Ryan, F., Song, Z., Wanberg, C.R., Kinicki, A.J. (2005), Psychological and physical well-being during unemployment: A meta-analytic study. Journal of Applied Psychology, 90(1), 53.

McKenzie, L.M., Witter, R.Z., Newman, L.S., Adgate, J.L. (2012), Human health risk assessment of air emissions from development of unconventional natural gas resources. Science of the Total Environment, 424, 79-87.

Mehta, N.K., Chang, V.W. (2008), Weight status and restaurant availability: A multilevel analysis. American Journal of Preventive Medicine, 34(2), 127-133.

Mouratidis, K. (2021), Urban planning and quality of life: A review of pathways linking the built environment to subjective well-being. Cities, 115, 103229.

Murphy, M. (2014), Self-determination as a collective capability: The case of indigenous peoples. Journal of Human Development and Capabilities, 15(4), 320-334.

Myers, D. (1988), Building knowledge about quality of life for urban planning. Journal of the American Planning Association, 54(3), 347-358.

Neirotti, P., De Marco, A., Cagliano, A.C., Mangano, G., Scorrano, F. (2014), Current trends in Smart City initiatives: Some stylised facts. Cities, 38, 25-36.

Neulinger, A., Bársony, F., Gjorevska, N., Lazányi, O., Pataki, G., Takács, S., Török, A. (2020), Engagement and subjective well-being in alternative food networks: The case of Hungary. International Journal of Consumer Studies, 44(4), 306-315.

Newman, P., Kenworthy, J. (2013), Greening urban transportation. In: State of the World 2007. England, UK: Routledge. p98-121.

Nordhaus, W.D., Tobin, J. (1973), Is growth obsolete? In: The Measurement of Economic and Social Performance. Cambridge: NBER, p509-564.

Novaco, R.W., Gonzalez, O.I. (2009), Commuting and well-being. Technology and Well-Being, 3, 174.

Ohta, R., Sato, M., Kitayuguchi, J., Maeno, T., Sano, C. (2021), The association between the self-management of mild symptoms and quality of life of elderly populations in rural communities: A cross-sectional study. International Journal of Environmental Research and Public Health, 18(16), 8857.

Osbaldiston, R., Sheldon, K.M. (2003), Promoting internalized motivation for environmentally responsible behavior: A prospective study of environmental goals. Journal of Environmental Psychology, 23(4), 349-357.

Parra, D.C., Gomez, L.F., Sarmiento, O.L., Buchner, D., Brownson, R., Schimd, T., Lobelo, F. (2010), Perceived and objective neighborhood environment attributes and health related quality of life among the elderly in Bogota, Colombia. Social Science and Medicine, 70(7), 1070-1076.

Piazzesi, M., Schneider, M., Tuzel, S. (2007), Housing, consumption and asset pricing. Journal of Financial Economics, 83(3), 531-569.

Pires-Júnior, R., Coledam, D.H.C., de Aguiar Greca, J.P., de Arruda, G.A., Teixeira, M., de Oliveira, A.R. (2018), Physical fitness and health-related quality of life in Brazilian adolescents: A cross-sectional study. Human Movement, 19(2), 3-10.

Popkin, B.M., Adair, L.S., Ng, S.W. (2012), Global nutrition transition and the pandemic of obesity in developing countries. Nutrition Reviews, 70(1), 3-21.

Popova, Y. (2017), Relations between wellbeing and transport infrastructure of the country. Procedia Engineering, 178, 579-588.

Prüss-Üstün, A., Corvalán, C. (2006), Preventing disease through healthy environments. Towards an estimate of the environmental burden of disease. Geneva: World Health Organization.

Rainwater, L. (1990), Poverty and Equivalence as Social Constructions (No. 55). LIS Working Paper Series.

Rapley, M. (2003), Quality of life research: A Critical Introduction. Thousand Oaks, California: Sage.

Rasheed, S., Woods, R.T. (2013), Malnutrition and quality of life in older people: A systematic review and meta-analysis. Ageing Research Reviews, 12(2), 561-566.

Ravallion, M., Lokshin, M. (2001), Identifying welfare effects from subjective questions. Economica, 68(271), 335-357.

Reif, J., Szarvas, F., Šťastný, K. (2021), 'Tell me where the birds have gone'-reconstructing historical influence of major environmental drivers on bird populations from memories of ornithologists of an older generation. Ecological Indicators, 129, 107909.

Reif, A., Rumler, F. (2014), Within-and Cross-Country Price Dispersion in the Euro Area. ECB Working Paper Series No. 1742.

Renwick, L., Drennan, J., Sheridan, A., Owens, L., Lyne, J., O'Donoghue, B., Clarke, M. (2017), Subjective and objective quality of life at first presentation with psychosis. Early Intervention in Psychiatry, 11(5), 401-410.

Rinklebe, J., Antoniadis, V., Shaheen, S.M., Rosche, O., Altermann, M. (2019), Health risk assessment of potentially toxic elements in soils along the Central Elbe River, Germany. Environment International, 126, 76-88.

Roback, J. (1982), Wages, rents, and the quality of life. Journal of Political Economy, 90(6), 1257-1278.

Rogoff, K. (1996), The purchasing power parity puzzle. Journal of Economic Literature, 34(2), 647-668.

Rowley, S., Ong, R. (2012), Housing affordability, housing stress and household wellbeing in. Mental Health, 76(69), 67.

Ruggeri, M., Warner, R., Bisoffi, G., Fontecedro, L. (2001), Subjective and objective dimensions of quality of life in psychiatric patients: A factor analytical approach: The South Verona Outcome Project 4. The British Journal of Psychiatry, 178(3), 268-275.

Sadalla, E., editor. (2005), The US-Mexican Border Environment: Dynamics of Human-Environment Interactions. Vol. 11. United States: SCERP and IRSC Publications.

Sarvimäki, A., Stenbock-Hult, B. (2000), Quality of life in old age described as a sense of well-being, meaning and value. Journal of Advanced Nursing, 32(4), 1025-1033.

Saxena, S., Thornicroft, G., Knapp, M., Whiteford, H. (2007), Resources for mental health: Scarcity, inequity, and inefficiency. The Lancet, 370(9590), 878-889.

Schor, J.B. (1998), The Overspent American: Upscaling, Downshifting, and the New Consumer. New York: Basic Books. p272.

Schroeter, C., Lusk, J., Tyner, W. (2008), Determining the impact of food price and income changes on body weight. Journal of Health Economics, 27(1), 45-68.

Scitovsky, T. (1976), The Joyless Economy: An Inquiry into Human Satisfaction and Consumer Dissatisfaction. New York: Oxford University Press.

Sen, A. (1992), The political economy of targeting. Washington, D.C.: World Bank.

Serletis, A., Gogas, P. (2004), Long-horizon regression tests of the theory of purchasing power parity. Journal of Banking and Finance, 28(8), 1961-1985.

Shapiro, J.M. (2006), Smart cities: Quality of life, productivity, and the growth effects of human capital. The Review of Economics and Statistics, 88(2), 324-335.

Shin, D.C., Johnson, D.M. (1978), Avowed happiness as an overall assessment of the quality of life. Social Indicators Research, 5(1), 475-492.

Silvester, K., Lendon, R., Bevan, H., Steyn, R., Walley, P. (2004), Reducing waiting times in the NHS: Is lack of capacity the problem? Clinician in Management, 12(3), 20-29.

Smith, K.W., Avis, N.E., Assmann, S.F. (1999), Distinguishing between quality of life and health status in quality of life research: A meta-analysis. Quality of Life Research, 8(5), 447-459.

Solberg, Ø., Sengoelge, M., Johnson-Singh, C.M., Vaez, M., Eriksson, A.K., Saboonchi, F. (2022), Health-related quality of life in refugee minors from Syria, Iraq and Afghanistan resettled in Sweden: A nation-wide, cross-sectional study. Social Psychiatry and Psychiatric Epidemiology, 57(2), 255-266.

Stone, W., Sharam, A., Wiesel, I., Ralston, L., Markkanen, S., James, A. (2015), Accessing and Sustaining Private Rental Tenancies: Critical Life Events, Housing Shocks and Insurances. AHURI Final Report. Melbourne: Australian Housing and Urban Research Institute Limited. p259.

Suzuki, H., Murakami, J., Hong, Y.H., Tamayose, B. (2015), Financing Transit-oriented Development with Land Values: Adapting Land Value Capture in Developing Countries. Washington, D.C.: World Bank Publications.

Tan, K.G., Chuah, H.Y., Luu, N.T.D. (2018), A case study on Malaysia and Singapore: Nexus amongst competitiveness, cost of living, wages, purchasing power and live ability. Competitiveness Review: An International Business Journal, 28, 172-179.

Tang, T.L.P. (2007), Income and quality of life: Does the love of money make a difference? Journal of Business Ethics, 72(4), 375-393.

Taylor, A.M., Taylor, M.P. (2004), The purchasing power parity debate. Journal of Economic Perspectives, 18(4), 135-158.

Taylor, S.E., Brown, J.D. (1988), Illusion and well-being: A social psychological perspective on mental health. Psychological Bulletin, 103(2), 193.

Testa, M.A., Nackley, J.F. (1994), Methods for quality-of-life studies. Annual Review of Public Health, 15(1), 535-559.

Thøgersen, J. (2006), Norms for environmentally responsible behaviour: An extended taxonomy. Journal of Environmental Psychology, 26(4), 247-261.

Tobin, J., Nordhaus, W.D. (1972), Economic Growth. Cambridge: National Bureau of Economic Research.

Todaro, M.P., Smith, S.C. (2020), Economic Development. London, United Kingdom: Pearson.

Tov, W., Diener, E. (2009), The well-being of nations: Linking together trust, cooperation, and democracy. In: The Science of Well-Being. Dordrecht: Springer. p155-173.

UNECE. (2009), Measuring Sustainable Development. New York/Geneva: United Nation Economic Commission for Europe United Nations Publication.

United Nations Development Program (UNDP). (1990), Human Development Report 1990. New York: Oxford University Press.

Valin, H., Sands, R.D., Van der Mensbrugghe, D., Nelson, G.C., Ahammad, H., Blanc, E., Willenbockel, D. (2014), The future of food demand: Understanding differences in global economic models. Agricultural Economics, 45(1), 51-67.

Van Aardenne, J.A., Carmichael, G.R., Levy II, H., Streets, D., Hordijk, L.

(1999), Anthropogenic NOx emissions in Asia in the period 1990-2020. Atmospheric Environment, 33(4), 633-646.

Veenhoven, R. (1993), Happiness in Nations. Subjective Appreciation of Life in 56 Nations 1946-1992. Rotterdam: Erasmus University Rotterdam.

Ventegodt, S., Merrick, J., Andersen, N.J. (2003), Quality of life theory I. The IQOL theory: An integrative theory of the global quality of life concept. The Scientific World Journal, 3, 1030-1040.

Wen, L., Kenworthy, J., Guo, X., Marinova, D. (2019), Solving traffic congestion through street renaissance: A perspective from dense Asian cities. Urban Science, 3(1), 18.

Williams, B. (2009), Philosophy as a humanistic discipline. In: Philosophy as a Humanistic Discipline. United States: Princeton University Press.

Wong, T.K.Y., Wan, P.S., Hsiao, H.H.M. (2011), The bases of political trust in six Asian societies: Institutional and cultural explanations compared. International Political Science Review, 32(3), 263-281.

World Health Organization. (2002), The World Health Report 2002: Reducing Risks, Promoting Healthy Life. Geneva: World Health Organization.

World Health Organization. (2012), Health in the Green Economy: Health Co-benefits of Climate Change Mitigation-Transport Sector. Geneva: World Health Organization.

World Health Organization. (2014), Global Status Report on Non-communicable Diseases 2014 (No. WHO/NMH/NVI/15.1). Geneva: World Health Organization.

Wu, W. (2004), Sources of migrant housing disadvantage in urban China. Environment and Planning A, 36(7), 1285-1304.

Ya-Wen, C., Hsiao, S. (2006), Quality of life: Scaling with Maslow's need hierarchy. Gerontology, 52(6), 376.

Zezza, A., Tasciotti, L. (2010), Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries. Food Policy, 35(4), 265-273.

Zheng, Y. (2010), Association analysis on pro-environmental behaviors and environmental consciousness in main cities of East Asia. Behaviormetrika, 37(1), 55-69.

APPENDIX

Table A: Descriptive statistic

	QL	PI	HCI	PPI	GI	DM	CLI	RII	TI	RI
Mean (2017)	104.6724	70.30462	67.09143	78.16987	44.33133	0.743590	45.63669	33.57515	189.0997	23.21733
Mean (2018)	104.7119	71.91448	66.28445	68.44116	45.56605	0.813953	46.67628	35.23814	186.4379	21.20884
Mean (2019)	115.8748	71.53800	65.62095	62.14976	39.68762	0.785714	42.48667	33.03024	178.8988	18.91548
Med (2017)	104.4700	75.57000	67.99000	80.59000	43.02000	1.000000	43.47000	28.25000	167.6600	14.84000
Med (2018)	104.7800	75.07000	67.36000	56.89000	37.48000	1.000000	40.97000	29.18000	162.9300	12.10000
Med (2019)	112.6200	76.96000	67.17000	56.05500	34.27000	1.000000	38.02500	26.62500	172.7500	12.46500
Max (2017)	188.4800	95.35000	86.96000	184.0900	91.92000	1.000000	83.67000	89.20000	366.7900	82.57000
Max (2018)	188.4800	94.60000	85.73000	129.2000	107.0600	1.000000	93.81000	97.21000	366.7900	79.54000
Max (2019)	174.0400	93.21000	85.38000	135.9600	97.22000	1.000000	88.45000	86.44000	283.6800	76.83000
Min (2017)	31.41000	18.45000	35.88000	26.39500	25.20000	0.000000	24.06000	13.87000	85.78000	5.730000
Min (2018)	24.13000	24.90000	36.67000	27.62000	24.65000	0.000000	25.46000	16.04000	85.78000	5.700000
Min (2019)	65.11000	27.21000	36.87000	26.24000	19.21000	0.000000	21.58000	15.83000	95.94000	4.580000
S.D (2017)	40.29644	18.69303	11.68147	38.33626	17.61380	0.442359	17.50942	17.30736	67.24994	21.68495
S.D (2018)	41.41297	17.21894	11.72955	30.39780	21.20206	0.393750	19.69294	17.67874	68.44578	19.51739
S.D (2019)	32.76304	17.24454	10.01587	28.94254	18.62143	0.415300	17.89212	15.92315	55.29497	15.89434
Skew (2017)	−0.015534	−0.908954	−0.497182	0.729451	0.997842	−1.115718	0.736190	1.374765	0.507416	1.597806
Skew (2018)	−0.121584	−0.883579	−0.659579	0.364454	1.360427	−1.613559	1.093440	1.503164	0.658396	1.678162
Skew (2019)	0.239282	−0.905487	−0.432997	0.889151	1.491108	−1.392621	0.996888	1.307787	0.470625	1.598025
Kurtosis (2017)	2.280672	3.260371	3.527305	3.008179	3.454726	2.244828	2.544235	4.484521	2.601466	4.449991
Kurtosis (2018)	2.280334	3.129392	3.221381	1.827880	3.962438	3.603571	3.085996	4.969441	2.621423	4.822596
Kurtosis (2019)	1.926570	2.973072	3.422534	2.984470	4.678774	2.939394	3.070961	4.323392	2.191553	5.623537
J-Bera (2017)	0.820797	5.480451	2.058569	3.458749	6.807982	9.018093	3.860386	15.86605	1.931661	20.01091
J-Bera (2018)	1.033881	5.625097	3.205631	3.413437	14.92340	19.31163	8.581796	23.14242	3.363429	26.13463
J-Bera (2019)	2.417233	5.740613	1.624843	5.534543	20.49581	13.58219	6.965316	15.03704	2.694193	29.92095
Ob. (2017)	39	39	39	39	39	39	39	39	39	39
Ob. (2018)	43	43	43	43	43	43	43	43	43	43
Ob. (2019)	42	42	42	42	42	42	42	42	42	42

Table B: Correlation matrix

Variables	QL	PI	HCI	PPI	GI	DM	CLI	RII	TI
PI (2017)	−0.577210***								
HCI (2017)	0.43290***	−0.520***							
LPPI (2017)	0.272333*	−0.140107	0.117120						
GI (2017)	0.154722	−0.416183	0.31510**	0.227488					
DM (2017)	−0.178861	0.160104	−0.069714	−0.4005**	−0.682***				
CLI (2017)	0.240171	−0.432***	0.296211*	0.254556	0.9379***	−0.732***			
RII (2017)	0.319105*	−0.3334**	0.184361	0.199080	0.6689***	−0.609***	0.8590***		
TI (2017)	−0.5282***	0.40749**	−0.244757	0.022788	−0.246801	0.167364	−0.305962	−0.30724*	
RI (2017)	0.064473	−0.29217*	0.086951	0.32521**	0.82533**	−0.765***	0.8643***	0.7346***	−0.210953
PI (2018)	−0.5632***								
HCI (2017)	0.49938***	−0.38020**							
PPI (2018)	0.52509***	−0.4328***	0.37890**						
GI (2018)	0.233748	−0.5383***	0.4807***	0.4357***					
DM (2018)	−0.236462	0.233587	−0.158753	−0.4118***	−0.4784***				
CLI (2018)	0.274144*	−0.5291***	0.4250***	0.4580***	0.9441***	−0.5977***			
RII (2018)	0.32729**	−0.3931***	0.253219	0.4437***	0.6545***	−0.6161***	0.8463***		
TI (2018)	−0.5456***	0.4934***	−0.23918	−0.164771	−0.2661*	0.165474	−0.2781*	−0.243161	
RI (2018)	0.097941	−0.3605**	0.179911	0.4748***	0.7247***	−0.6774***	0.8244***	0.8017***	−0.180699
PI (2019)	−0.7259***								
HCI (2019)	0.4961***	−0.4283***							
PPI (2019)	0.6645***	−0.4166***	0.4231***						
GI (2019)	0.28689*	−0.4565***	0.5051***	0.3740**					
DM (2019)	−0.108014	0.137562	−0.16677	−0.4139***	−0.4717***				
CLI (2019)	0.3775**	−0.4745***	0.4217***	0.4652***	0.9449***	−0.5694***			
RII (2019)	0.4143***	−0.4280***	0.19493	0.5323***	0.6656***	−0.6088***	0.8404***		
TI (2019)	−0.5274***	0.3751**	−0.02317	−0.18668	−0.202181	0.040147	−0.230312	−0.191029	
RI (2019)	0.201781	−0.3691**	0.24311	0.4905***	0.7417***	−0.6832***	0.8203***	0.7526***	−0.151503

***1% significant level **5% significant level *10% significant level

Table C: Diagnostics test-year 2017

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.692909	Prob. F (2,26)	0.2036
Obs*R-squared	4.378340	Prob. Chi-square (2)	0.1120
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.831333	Prob. F (9,28)	0.5936
Obs*R-squared	8.012960	Prob. Chi-square (9)	0.5328
Scaled explained SS	3.348587	Prob. Chi-square (9)	0.9489

Table D: Diagnostics test-year 2018

Breusch-Godfrey serial correlation LM test			
F-statistic	0.195141	Prob. F (2,31)	0.8237
Obs*R-squared	0.534629	Prob. Chi-square (2)	0.7654
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.067395	Prob. F (9,33)	0.4115
Obs*R-squared	9.695267	Prob. Chi-square (9)	0.3757
Scaled explained SS	7.465962	Prob. Chi-square (9)	0.5887

Table E: Diagnostics test-year 2019

Breusch-Godfrey Serial Correlation LM Test		
F-statistic	0.008802	Prob. F (1.31)
Obs*R-squared	0.011922	Prob. Chi-square (1)
Heteroskedasticity Test: Breusch-Pagan-Godfrey		
F-statistic	0.605927	Prob. F (9.32)
Obs*R-squared	6.115353	Prob. Chi-square (9)
Scaled explained SS	5.305575	Prob. Chi-square (9)