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EFFECTS OF RURAL AND URBAN POPULATION ON HEALTH CARE EXPENDITURE: CASE OF CHINA AND INDIA.

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ABSTRACT

This paper examines the effects of population at rural and urban on health care expenditure in the case of China and India. Total population in China and India increased from year to year, as in 1970 total population is 5.78 million to 1.21 billion in 2015 for China and 5.54 million and increased to 1.25 billion for India. Projection of population established in 2015 predict that the total population will keep growing until at least 2050, reaching an estimated 8 billion people in 2024, and 9 billion people in 2024 and 9 billion by 2040. As the demographic transition follows its course worldwide, the population will age significantly, with most countries outside Africa trending towards a rectangular age pyramid. But total population in urban is higher than population in rural. For urban population they will spend with their own money for healthcare or out of pocket expenditure. This paper is estimate the comparison between population in rural and urban on healthcare expenditure in case of China and India. By using bound testing approach to cointegration and error correction model, developed within an autoregressive distributed lag (ARDL) framework developed by Pesaran et al. (1999) and data cover from period 1970-2016, we investigate whether a long-run equilibrium relationship exists between population and health care expenditure. Using this approach, the expected result for long run relationship between population in rural and urban on health care expenditure is positive but the healthcare expenditure for urban population is higher than rural population.

Keywords: Rural Population, Urban Population, Healthcare Expenditure, ARDL Bound Test, China, India

1.0 Introduction

The growth of healthcare expenditure is of particular concern to rural populations whose incomes are significantly lower than their urban counterparts (Hawk, 2011). This research examines rural and urban population differences in total healthcare expenditures. China and India are similarly huge nations currently experiencing rapid economic growth, huge population, and urbanization and widening inequalities between rich and poor. They are dissimilar.According to global healthcare "health for all" undertaken by the World Health Organization (WHO), healthcare service is supposed to be necessary services provided to the whole population, by means of distributing the health resources evenly, regardless of wealth or areas. In the global level and on a national level of countries, the goal was attained and was adopted in 1981 is "health for all". From international perspective, health resources are not evenly distributed among countries. One of the most important human resources, the density of physicians reflects a remarkable inequality all over the world. On a national level, uneven distribution of health resources exists in different aspects for different countries. In some developing Asian countries, the disparity of healthcare resources due to the proportionality of socioeconomic development between rural and urban areas becomes one of the pressing concerns.

China and India have similarities in geographical, demographical, historic, cultural and socio-economic conditions, which prove the comparability for them to be studied comparatively. The disparity and inequality between urban and rural areas is serious because of their complex environment and progress of the social development with new coming issues such as economic transition. From macroeconomic perspective, healthcare system in rural areas is considered to be the most crucial issues which is urgent to be well developed in the Asian countries. Lacking of the health care services in rural areas may result in more health and even social problems, which might worsen the healthcare system and bring the system in a vicious circle. Figure 1 shows the total rural and urban population in China and India. From these, rural population in China is lower than India while for urban population in China is higher than in India.

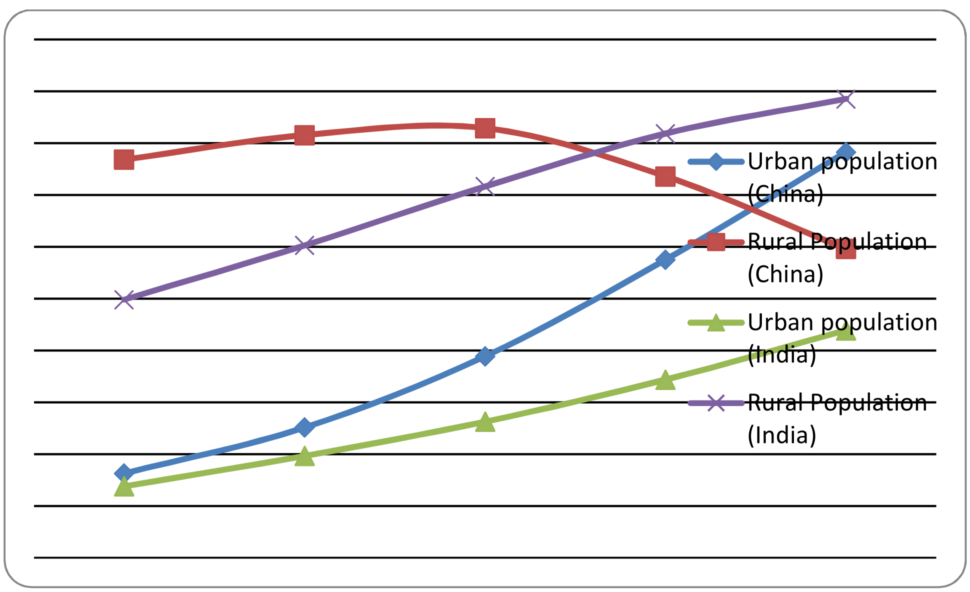

Figure 1: Total rural and urban population in China and India from 1976 to 2016
(Source: World bank Indicator, 2016).

Health is determined by many factors among which medical care is only one. These factors include social class, work environment, employment status, and income, housing conditions, heating, education, diet and lifestyle. Demand for health care is a derived demand from the demand for health. Health care is demanded as a means for consumers to achieve a larger stock of “health capital”. The demand for health is unlike most other goods because individuals allocate resources in order to both consume and produce health. MichealGrossman’s 1972 model of health production was concerned with how individuals allocate their resources to produce health. Grossman’s model views each individual as both a producer and a consumer of health. Health is treated as a stock which degrades over time in the absence of investment in health, so health is view as a sort of capital. The model acknowledges that health is both consumption good that yields direct satisfaction utility, and an investment good, which yields satisfaction to consumers indirectly through increased productivity, fewer sick days and higher wages. Investment in health is costly as consumers must trade off time and resources devoted to health. The model also make prediction over the effects of changes in price of health care and other goods, labor market outcomes such as employment and wages, and technological changes. Bad health gives more sick days than good health; days cannot be used to mentioned activities. Thus better health increases the available time, which can be measured in a monetary value. This may be through of as a return to investment in health. In addition to the two mentioned reasons to have a good health, the stock of health is also essential to determine the length of life. When the stock reduces to a certain level, the minimum health level and life terminates.

With the economic and healthcare services development in China, life expectancy has been rising steadily in the past three decades. Total life expectancy in China could still rise, albeit at a relatively slower rate than in previous decades, in the next 40 years; and it will hit almost 80 in 2050 (China Healthcare Policy Study, 2011). With lower birth rates and extended life expectancy in China, it is widely believed that the country is becoming an aged society. Expenditures on healthcare services represent a relatively modest share of China’s GDP (5.16 percent in 2011).The pace of GDP growth has been unprecedentedly rapid, however, and healthcare spending in China has increased during the reformation era, to 64.43 percent of spending in 2001. In 2002, with the beginning of government-subsidized health insurance for rural Chinese, the private spending constituted a little over half of China’s total healthcare spending, much higher than that of many low and middle income countries.

Over the past 50 years, China has made substantial improvements in health, such as increased life expectancy, reduced infant mortality, and the eradication of several diseases. Despite these improvements, China’s health status still lags that of other populations in developed and developing countries. According to the international standard, a country with either 10 percent of the population over 60 or 7 percent of the population over 65 is considered to be an aging country. According to the National Bureau of Statistics of China, China became an ageing country with 7% of the population over 65 years old in 2000, and this percentage has been continuously rising. The forecast made by the Organization for Economic Co-operation Development (OECD) suggests that the ageing trend of China’s population will speed up in the next few decades. In 2020, it is estimated that 11.61 percent of China’s total population will be people who are over 65 years old.

From the view point of the healthcare sector in India, the India healthcare sector faced shortages of workforce and infrastructure India had 1.7 trained doctor and nurses per 1,00 population in the year compared to the World Health Organization (WHO) recommended guidelines of 2.5 per 1,00 population. Besides that, total bed density in the country was 0.67 per 1,000 populations in the year 2002, below the global average of 2.6 and WHO benchmark of 3.5. India have a major challenges persists such as, the health indicators continue to lag with outcome indicators, such as infant mortality rate and life expectancy continue to fall behind low and middle income country averages. Besides that, healthcare spend is not growing at the same pace as GDP, as per WHO National health Accounts, India’s healthcare spending as a percentages of GDP has reduced from 4.4 percent in 2000 to 4.0 percent in 2010. This implies that, in normal terms, India’s health expenditure has grown at a slower rate than the country’s GDP. Total out-of-pocket spending continues to be high, with despite that the fact that the public spend has increased, and implying that thus public spending has struggled to keep pace with the rise in healthcare demand. On the other hands, the challenges from the infrastructure at India that gaps remain substantial, and are exacerbated by under utilisation of existing resources. Total bed density has increased to 1.3 per 1,000 in 2010, but remains significantly lower than WHO guideline of 3.5 beds per 1,000. With the different healthcare system in China and India and different total rural and urban population, the objective of this study is to examine the impact of rural and urban population on healthcare expenditure.

The rest of paper is organized as follows. Sections 2 discuss the empirical literature. It is followed by a review of the data, methodology and empirical model are discussed in Section 3. After discussing the empirical model used in this study, Section 4 describe the effects of rural and urban population on healthcare expenditure in China and India. The final section concludes and outlines several policy implications.

2.0 Literature Review

Health is a major concern all over the world, especially for the developing countries with an extremely large population and limited health resources and with the wide gaps in every aspect between urban and rural areas. Wang (2011) studied about the healthcare system in rural areas which comparative analysis in financing mechanism and payment structures between China and India. Thus the result was found that China and India have similar three-level health centre under the rural health systems. The majority of the public health care costs are paid by government, with a much smaller proportion paid by the rural health system in China, a social insurance as the financing mechanism is running well through pooling risk and contributions, a formal comprehensive mechanism is lacking in India, where the government just provides most of the healthcare services for free.

Besides that, China and India are similarly huge nations currently experiencing rapid economic growth, urbanization and widening inequalities between rich and poor. Studied by Dummer and Cook (2008), in general India have higher burden infectious disease than China. Whilst globalization contributes to widening inequalities in health and healthcare in China and India particularly respect to increasing disparities between urban and rural areas and between rich and poor. For example, India has huge problems providing even rudimentary healthcare to its large population of urban whilst China is struggling to establish universal rural health insurance. In terms of funding access to health care, the Chinese state has traditionally supported most costs, whereas private insurance has always played a major role in India, although recent changes in China have seen the burgeoning of private health care payments. China has, arguably, had more success than India in improving population health, although recent reforms have severely impacted upon the ability of the Chinese health care system to operate effectively. Both countries are experiencing a decline in the amount of government funding for health care and this is a major issue that must be addressed.

Lee, Jiang, Phillips and Ohsfeldt (2014) studied about differences effects of rural and urban population in healthcare expenditure and the result was found that rural population spend more on medications, while urban population spend more on emergency care. However, no rural and urban difference was found in total health care expenditure. Total healthcare expenditure does not seem to vary significant across urban and rural areas.

Studied by Feng, Lou and Yu (2015) investigate the age profiles of health expenditure for rural and urban residents in the People’s Republic of China. They employing a two part model, and the result found that health expenditure or rural residents is averagely 33% lower than that of urban residents and age expenditure profile is much steeper in urban areas than in rural areas. Besides that, they also found that, health spending of the rural elderly is better than that of the urban elderly. The findings imply that health spending of the rural elderly may increase more during the process of rural urban integration.

Many empirical studies have shown that demographic factors have a strong influence on health care spending. An increase in population also affects health care expenditures. People will demand more from health care, especially for the elderly. Feldstein (1996) found that demographic variables also influence the level and composition of public spending as the elderly population demands more from health care, housing, and social security. An increase in government spending affects the increase in demographic transitions, such as population density.

Samadi and Rad (2013) studied the determinant of healthcare expenditure in Economic Cooperation Organization (ECO) using panel data econometrics and they found that a long term relationship was found between health care expenditures per capita and GDP per capita, the proportion of population below 15 and above 65 years old, number of physicans, and urbanization. Besides, all the variables had short term relationships with health care expenditure, except for the proportion of population above 65 years old.

Sanz and Velzquez (2007) and Remmer (2004) found that the variation of the dependency ratio of the population must be taken into account because this proxy is increasing government spending, especially health care and social security. They measured the dependency ratio as the percentage of the population that is 65 years of age or older. In addition, Dummer and Cook (2008) examined health care in China and India. China and India are similar in rapid economic growth and demographic factors. The factors that determine health care spending are supply side factors. On the supply side factor, the factors depend on the health status and the ability of the elderly rather than on age.

Evidence exists regarding the significant effect of variables such as an elderly or a young population. An earlier study by Newhouse (1992) found that age composition has important effects on health care expenditures, and this variable has been included in most of the macro studies since then. Leu (1989) found that the young population under 15 years of age has a positive relation with health care expenditures, while a population above 65 years of age is negatively correlated with health care expenditures and result found by Boulet et al. (2008) found that the medical cost for the children with the down syndrome are 12 to 13 times higher than the for normal children.

In addition, a study by Getzen (1992) found that the effects of the elderly population on health care expenditures in OECD countries is dominated by the macroeconomic effects of GNP growth and is without government budget constraints, which will increase health care expenditures. There are many researchers who have found a significant and positive relationship between the elderly population and health care expenditures. Hitiris and Posnett (1992) and Gerdtham et al. (1992a) found that the effects of the elderly population on health care expenditures is small positive effects, and Gerdtham et al. (1992b) also found a positive effect on health care expenditures for the age variable measured by the ratio of 65+ years of age/15-64 years of age, and the ages of 65 and above were negatively related to health care expenditures. Jonsson and Eckerlund (2003) found a positive and significant effect of age on health care expenditures.

Many empirical have shown that gross domestic product (GDP) has a strong influence health care expenditure. From Newhouse (1977), Gerdtham and Jonsson (1992) and Hitiris and Posnett (1992) by using cross-sectional OECD data, founded that gross domestic product was one of the most important determinant of aggregate health care expenditure. In Getzen (1999), the model proposed that used GDP and inflation factor. In Getzen (2000), suggested that health spending is more a function of income over previous five years than of current. That is GDP growth effectively has impact on private health spending after three or five years.

There also have been many studies that have shown the relationship between GDP and health care expenditures. Taban (2006) found no causal relationship between health care expenditures and economic growth and that a positive and high impact of health care on productivity and economic growth could justify increasing health expenditures and improving the health status of a society. On the other hand, Lago-Penas, Cantarero-Prieto, and Blazquez-Fernandez (2013) found a positive relationship between GDP and health care expenditures, while Baltagi and Moscone (2010), Mehrara et al. (2010), and Liu, Li, and Wang (2011) found that health care expenditures are a necessity rather than a luxury for OECD countries. Ben, Sghari, and Hammami (2014) found that per capita GDP exerts a statistically significant positive effect on per capita health care expenditures.

3.0 Data and Methodology

In this study, we employed time series data analysis. To examine the order of integration, autoregressive distributed lags (ARDL) or a bounds test was used to examine the relation between exogenous and endogenous variables. In addition, a unit root test was used to test for stationary. The time series data were annual and covered the period 1970-2016 for China and India. The healthcare expenditure was in per capita GDP. We also gathered data from the following variables which have been identified in literature for their roles in determining healthcare expenditures: rural and urban population, life expectancy, GDPC and inflation rate. The independent variables are divided for several indicators such as GDPC for the economic indicator, population as the demographic indicator, life expectancy as the health indicator and inflation as a price factor. All data were obtained from the World Bank Indicator and the World Population Prospect 2016, and they were converted into natural logarithmic form before the empirical analysis.

To examine the effects of the rural and urban population on healthcare expenditure, ARDL bounds testing as introduced by Pesaran et al. (2001) was used on the following model. The healthcare expenditure (HCE) percent of GDP was predetermined as the dependent variable, while the independent variable was the rural population (RUR) and urban population (URB) and the control variables were life expectancy (LE) and gross domestic product per capita (GDPC).

The model specification was as follows:

$$HCE_t = f(RUR_t, URB_t, GDPC_t, LE_t,) \quad (1)$$

$$HCE_t = \beta_0 + \beta_1 RUR_{t-1} + \beta_2 URB_{t-1} + \beta_3 GDPC_{t-1} + \beta_4 LE_{t-1} + \mu_t \quad (2)$$

For multiple regression analysis, the log likelihood function of this model can be written as:

$$LNHCE_t = \beta_0 + \beta_1 LNRUR_{t-1} + \beta_2 LNURB_{t-1} + \beta_3 LNGDPC_{t-1} + \beta_4 LE_{t-1} + \mu_t \quad (3)$$

By using the autoregressive distributed lags (ARDL), the model is transformed into:

$$\begin{aligned} \Delta LNHCE_t = {} & \beta_0 + \beta_1 LNRUR_{t-1} + \beta_2 LNURB_{t-1} + \beta_3 LNGDPC_{t-1} + \beta_4 LNLE_{t-1} \\ & + \sum_{i=1}^{3} \beta_{5i}\, \Delta LNRUR_{t-1} + \sum_{i=1}^{3} \beta_{6i}\, \Delta LNURB_{t-1} + \sum_{i=1}^{3} \beta_{7i}\, \Delta LNGDPC_{t-1} \\ & + \sum_{i=1}^{3} \beta_{8i}\, \Delta LNLE_{t-1}\, \mu_t \end{aligned} \quad (4)$$

Where:
HCE = Healthcare Expenditure (% of GDP)

RUR= Rural Population
URB= Urban Population
$GDPC$= Gross Domestic Product per Capita
LE= Life Expectancy
Δ=First different operator

To examine the long-run relationship, bounds testing for cointegration based on critical values adopted from Pesaran et.al (2001) was used with the following null hypothesis (for no long-run relationship) and alternative hypothesis (for a long-run relationship): $H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ and $H_A \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$

4.0 Results and Discussions

4.1 Unit root test

A unit root test was done for all variables using the Augmented Dickey Fuller (ADF) and Phillips-Perron tests to satisfy the pre-requisite condition of the dependent variable's being non stationary or containing a unit root in I(1) and stationary at I(0) as prescribed by Pesaran (2001).

Tables 1 and Table 2 present the results of the ADF and Philips-Perron tests for China and India respectively. The order of integration was tested at 1, 5, and 10 percent significance levels, and the critical values were obtained from the Mackinnon (1991) Tables. The results were robust regardless of the lag length. They showed that after differencing the variables once, they were confirmed to be stationary. The ADF and Phillips-Perron tests applied to the first difference of the data series rejected the null hypothesis of non-stationarity for all the variables; therefore, it is worth concluding that all the variables used in this study were not I(2). Based on the ADF test statistic, it was found that the series stationary at different level for HCE and URB are stationary at level *I(0),* and the others variable are integrated at *I(1)* while for Philips-Perron test the variables HCE, RUR and GDPC are integrated at *I(1)*. Otherwise, for India ADF test statistic, it was found that the series stationary at different level for HCE, RUR and LE are stationary at level *I(0),* and the others variable are integrated at *I(1)* while for Philips-Perron test only the variables HCE and LE are integrated at *I(0).*

Table 1: ADF and PP unit root tests results for stationary of the variables for China

Variable	ADF				PP			
	Level		First Difference		Level		First Difference	
	Intercept	Trend & Intercept	Intercept	Trend & Intercept	Intercept	Trend & Intercept	Intercept	Trend & Intercept
LNHCE (Health Expenditure)	-0.3957 (0)	-3.7032 (1)**	-4.7068 (0)***	-4.6569 (0)***	-0.5797 (2)	-2.8778 (2)	-4.6662 (3)***	-4.4918 (4)***
LNRUR (Rural Population)	-0.0321 (2)	-0.4194 (2)	-1.6828 (1)***	-2.9683 (1)***	-1.6632 (5)	1.8800 (5)	0.8184 (2)***	0.0864 (2)***
LNURB (Urban Population)	-3.5949 (0)***	-1.1014 (0)**	-3.0357 (0)**	-4.1820 (0)**	-0.1494 (1)**	-1.9475 (1)***	-2.0437 (1)**	-1.6705 (1)**

LNGDPC (Gross Domestic Product per capita)	3.1742 (0)	0.0660 (1)	-5.0675 (0)***	-4.1145 (1)***	3.4768 (4)	0.1505 (3)	-5.1218 (2)***	-6.1645 (4)***
LNLE (Life Expectancy)	-2.5538 (0)	-2.8112 (0)	-6.5840 (0)***	-6.4668 (0)***	-2.6405 (2)*	-2.8798 (1)*	-8.2156 (13)***	-8.2834 (13)***

*** Significant at 1% level,** significant at 5% level, *significant at 10% level.

Table 2: ADF and PP unit root tests results for stationarity of the variables for India

Variable	ADF				PP			
	Level		First Difference		Level		First Difference	
	Intercept	Trend & Intercept	Intercept	Trend & Intercept	Intercept	Trend & Intercept	Intercept	Trend & Intercept
LNHCE (Health Expenditure)	-0.7074 (0)	-3.5234 (0)**	-6.2082 (0)***	-6.1095 (0)***	-3.5457 (3)**	-2.8778 (2)	-6.3889 (0)***	-6.1866 (0)***
LNRUR (Rural Population)	-3.5670 (2)***	-1.0094 (2)***	-4.2050 (3)***	-5.0166 (3)***	-1.6632 (5)	1.8800 (5)	0.8184 (2)***	0.0864 (2)***
LNURB (Urban Population)	-1.3340 (0)	-2.9084 (0)	-6.8971 (0)***	-6.5901 (0)***	-1.9032 (3)	-2.4590 (3)	-7.6037 (1)***	-7.4634 (1)***
LNGDPC (Gross Domestic Product per capita)	0.3934 (0)	-0.9259 (0)	-5.7715 (0)***	-5.7483 (0)***	0.2879 (3)	-1.1930 (3)	-5.7918 (2)***	-5.7676 (2)***
LNLE (Life Expectancy)	-5.0340 (2)***	-2.9960 (2)***	-2.6918 (2)***	-7.3228 (1)***	-4.1728 (5)*	-2.7390 (5)*	-1.6464 (5)***	-2.0692 (5)***

*** Significant at 1% level,** significant at 5% level, *significant at 10% level.

Table 2 represents the long run cointegration test analysis, and existence of long run relationship which has been found among the model's variables. Result illustrate that the computed F-statistic is 4.6890 (China) and 3.9570 (India). The relevant critical value bounds at five percent level and ten percent upper bound critical value for China and India respectively. Subsequently, the computed F-statistics is higher than the critical value of the upper bound, the null hypothesis of no long cointegration relationship among the variables can be simply rejected. Having established the presence of a long run association between health care expenditure, rural and urban population, gross domestic product per capita and life expectancy, the model can be used to estimate long run and short run parameters.

Table 3: Bounds Test for Cointegration Analysis Based on Equation (4)

	10 percent level		5 percent level		1 percent level	
k	*I*(0)	*I*(1)	*I*(0)	*I*(1)	*I*(0)	*I*(1)
5	2.696	3.898	3.276	4.630	4.590	6.368

Notes: The reported bounds critical values are taken from Narayan (2004), Table C[III].*k*is the number of regressors

The estimated of long-run and short run coefficient for healthcare expenditure with respect to rural population, urban population, GDPC and life expectancy is presented in Table 4. The impact of urban population on healthcare expenditure is higher in china than in India but for rural population is higher in India. This finding is support by Feng, Lou and Yu (2015). As the healthcare system is low than China and total out-of-pocket is higher in India thus the impact of healthcare expenditure is much higher in China rather than India.

For the short run estimation, the result of Error Correction Model (ECM). From the result it shows that the negative sign of ECM and this confirm that there has a long run relationship with variables. The coefficient of ECM for ageing population are negative sign and significant. These results are confirmed that there have long run relationships between the variables. The result in short run estimation indicates that urban population is influence the health care expenditure with 0.4908 in China and 0.4156 in India and significant at five percent significant level. However, for rural population, the result indicates that effect of rural population India is higher than in China. For the control variable, GDPC and life expectancy also give a positive effect to the health care expenditure.

Table 4: Long-run and short-run coefficient based on the ARDL model

	CHINA		INDIA	
Variable	Long run coefficient (1,0,1,0,0)	Short run coefficient	Long run coefficient (1,0,0,0,0)	Short run coefficient
Urban population (URB)	.7876 (.5825)**	.4908 (.8932)**	.4785 (.8955)**	.4156 (.6897)**
Rural population (RUR)	.5014 (.6895)**	.3201 (.5890)**	.5543 (.5785)**	.3901 (.5477)**
Gross Domestic Product (GDP)	.8912 (1.5843)**	.6932 (3.8932)***	.7321 (2.8905)**	.4193 (3.3051)***
Life Expectancy (LE)	.8932 (1.8901)	.8910 (1.7892)***	.6789 (1.2131)	.1809 (1.7610)***

Long run and Short-run results were presented using Microfit, 4.0.
Note: *** indicate significant at 1 percent, ** 5 percent and * 10 percent significance level.

To test the ARDL model, we applied a series of diagnostic tests and the result report in Table 5. It is clear that from the Table 5 that the model is clear from basic econometric problems for example serial correlation, normality and functional form. To test the stability of the model, cumulative sum of recursive residual test (CUSUM) and cumulative sum of square of recursive residuals test (CUSUMQ) proposed by Brown et al. (1975) were performed. CUSUM test is a residual test based on the cumulative sum of the residuals based on the first n-observation by updating recursively and then to be plotted against the break points. If the CUSUM plot stays within the 5 percent significant level (shows by two straight lines as a critical value lines), the estimated coefficient is stable. Similar measure also applies on CUSUMQ test which based on the square of the recursive residuals. The graphical presentation of health care expenditure for CUSUM and CUSUMQ describe on figure 2 until figure 5 confirm that coefficient over the sample period stays within the critical value lines, and then it can be conclude that the coefficient is stable.

Table 5: Diagnostic Test of the Rural and Urban Population on Healthcare Expenditure

Test	CHINA F-Statistic (p-value)	INDIA F-Statistic (p-value)
A. Serial Correlation	2.6976 [.105]	.1109 [.108]
B. Functional Form	.0225 [.891]	1.3221 [.341]
C. Normality	1.1047 [.554]	.4234 [.807]

Note:
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
Source: computation using Microfit 4.0

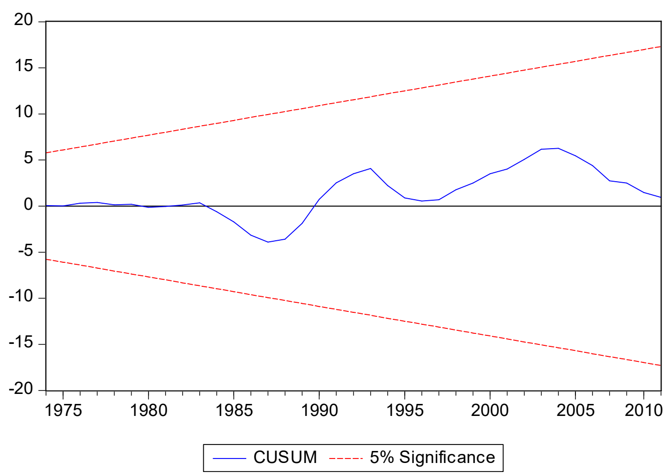

Figure 2: Cumulative Sum of Recursive Residuals for rural and urban population in China

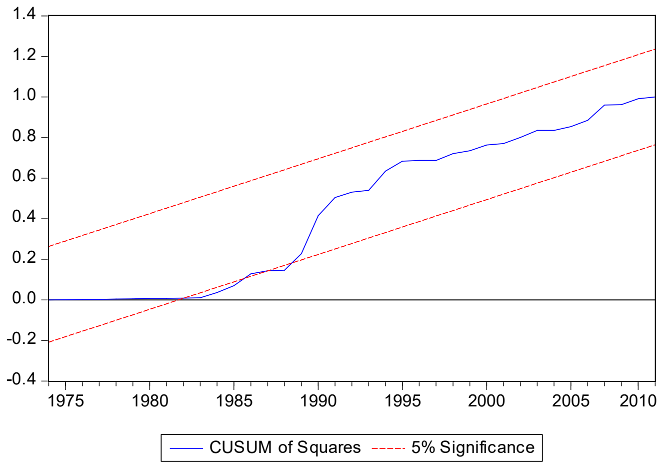

Figure 3: Cumulative Sum of Squares of Recursive Residuals for rural and urban population in China

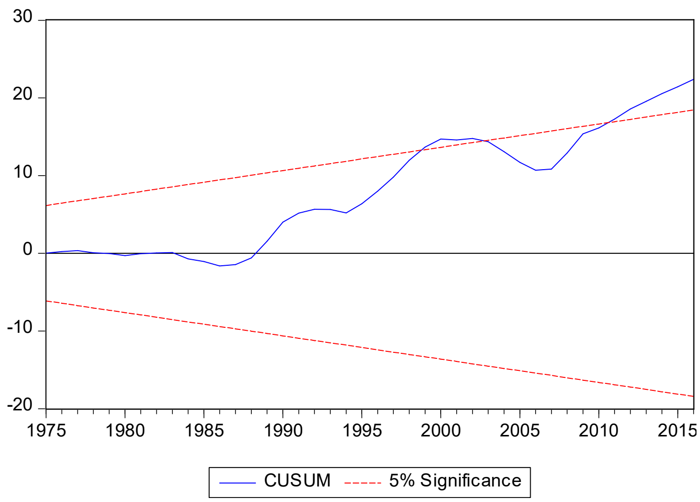

Figure 4: Cumulative Sum of Recursive Residuals for rural and urban population in India

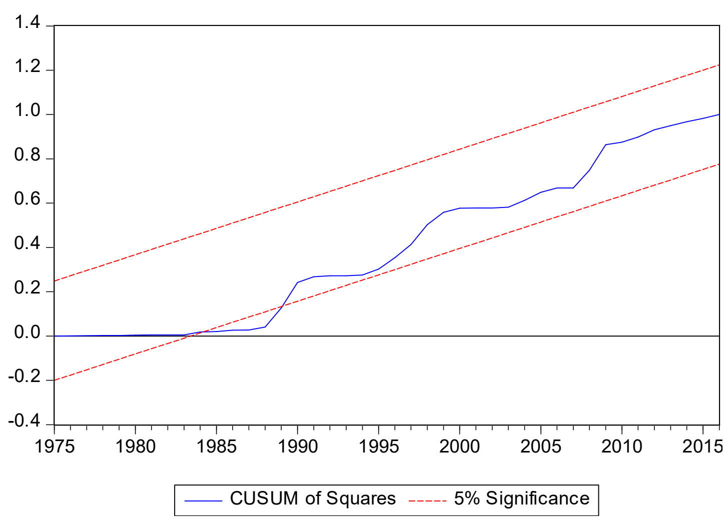

Figure 5: Cumulative Sum of Squares of Recursive Residuals for rural and urban population in India

5.0 Conclusion and Recommendations

This paper aims to examine the effects of rural and urban population and healthcare expenditure both in the short-run and long-run estimation in China and India, by using time series data on healthcare expenditure. The results confirmed that both in short-run and long-run estimations, the rural and urban population have a effects with healthcare expenditure. The urban population clearly shows relatively higher healthcare expenditure for China while rural population is higher in India. In China as an increasing absolute number of urban will inevitably increase healthcare expenditure. The growing enlarges the total patient pool the healthcare market because of China is facing an higher population, unfortunately, diseases especially chronic diseases affect older adults disproportionately, and as a result the country will be increasingly pressured to handle a growing sick population. In India, total rural population is increased but the level of infrastructure is still lower and below the average from the guidelines of WHO. Thus, as an increased in total number of population is directly effects to the demand for healthcare cost and total out-of-pocket in India is increase. Besides that many adult and older-age health problem were rooted in early life experiences and living condition, ensuring good child health can yields benefits for older people. In the meantime, generations of children and young adults who grew up in poverty and ill health in China and India will be entering old age in coming decades, potentially increasing the health burden of older population in this country.

The policies aimed at encouraging healthcare expenses and institutions, however, are required to build a healthier and more productive society to support China's and India economic growth and development. In addition, the government should minimize the gap of the unequal distribution of healthcare among people, by taking into consideration the spread of emerging chronic diseases and assuring the quality and performance of the healthcare supply both in China and India. In addition, state funding should be increased for healthcare provision, public health, and health insurance schemes. The economy in China is booming; this should not be at the expense of the poor and vulnerable in their societies. Both governments need to modify their predominantly neo-liberalist economic emphasis to ensure that state intervention in health is a sufficient proportion of GDP. China is vast in size and has large rural populations, in addition to huge urban centers. Thus, the development of effective partnerships between different spatial levels of health provision, from village to city, is essential. Besides that, there should be understood the magnitude of inequality between rural-urban population in access the healthcare across the rural-urban divide and income segment. It is also should analyze the different segment of population dimension of urbanization and income such as urban poor, urban middle income, urban rich, rural poor, rural middle income and rural rich and also the important of other factors such as gender and education.

Future research can consider other determinants of healthcare expenditure, such as technological progress and relative price; demographic indicators such as total population, population growth, and young population; health indicators such as birth rate, death rate, and infant mortality rate; and healthcare infrastructure such as private healthcare, public healthcare, and total number of physicians. The structure of this combination of factors has been the center of debate over whether increasing healthcare expenditure is influenced from the other factors. A larger data set and using another approach may also be beneficial to future research.

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