

# Tax Revenue and Life Expectancy Index of Select Countries

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## Abstract

Life expectancy is a key indicator of health in both developing and developed countries. Life Expectancy reflects the quality of life in a particular place. The objective of the study is to explore the inter-relationship between tax revenue and the life expectancy index (Health Index) of select countries. For the present study 5 countries, France, Italy, Brazil, Canada, and India, have been selected. These countries have been selected on the basis of the GDP of a particular country. For data analysis, Correlation, Regression have been used. For testing of hypothesis, t-test have been administered. Results of correlation show that Canada's tax revenue and life expectancy index have highly correlated other than remaining countries. Results also show the prediction model of the life expectancy index for select countries. The results show that the regression prediction model has been significant in all five countries. The difference between the actual life expectancy index and the predicted life expectancy index is not significant. It clearly indicates that the model developed by us is significant. It can be applied anywhere in the real world of life. For identifying the best prediction model from all select countries, results found that Canada's prediction model for the life expectancy index is the best prediction model. In the case of all select countries, the prediction model can be used to identify a particular target of life expectancy and also helps to determine how much tax revenue will be required for enhancing a life expectancy.

**Keywords:** Countries, Interrelationship, Life Expectancy at Birth, Life Expectancy Index, Tax revenue.

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## Introduction

Today health is the most important indicator of social and economic development of a particular country. Life expectancy is a key indicator of health in both developing and developed countries. It reflects the quality of

life in a particular place. The high quality of society's health can be used as an indicator of the success of the health programs and the development of a social and economic program that can increase life expectancy indirectly Budiantara, *et al.* [1]. The health of

any country's people depends upon government expenditure and welfare programs on people of the country. This expenditure is done through tax revenue. Therefore we can say that there is any relationship between tax revenue and life expectancy index. Generally, it is an assumption that there is a correlation between tax revenue and life expectancy. People agree that as soon as tax revenue is increased the life expectancy of the country is also increased because if the government collects good revenue through the taxes it will spend on the welfare of the society and if sufficient amount is spent on the welfare of the society in terms of health, education and standard of living then definitely the life expectancy will also be increased. Life expectancy is directly related to the medical facilities and medical facilities require expenditure. Expenditure is spent through the government and the main source of government is taxation, so definitely there should be a good relationship between the two but it is a matter of investigation whether really it works or not. In order to examine the relationship here, an attempt has been made to find out the relationship between life expectancy index and tax revenue whether it holds good or not, whether it held positive correlation or

negative correlation. We have tried to develop a prediction regression model that means if a particular country wants to achieve a particular life expectancy how much tax revenue is required. This prediction model can be used by the select countries to identify a particular target of life expectancy.

A lot of literature is available on the relationship between tax revenue and other factors. Edame&Okoi [2] examined the impact of taxation on investment and economic growth in Nigeria. Results show that taxation is negatively related to the level of investment and GDP. In another study, Ahmad *et al.* [3] explored the relationship between total tax revenues and economic growth in Pakistan. Some researchers find the relationship between economic growth and part of total tax revenue individually i.e. Ojonget *al.* [4] examined the relationship between petroleum profit tax, company income tax, non-oil tax revenue, and economic indicator GDP. Few authors, Venkataraman&Urmi [5] studied components of direct and indirect taxation and examined their individual effects on economic growth in India. Results revealed that in the longer period, the component of direct and indirect taxes, personal income tax and excise duty had a no statistically

significant impact on economic growth. Gatawa *et al.* [6] investigated the impact of VAT on economic growth in Nigeria.

Researchers studied the relationship between life expectancy and other factors i.e. Ling *et al.* [7] investigated the impact of trade openness on life expectancy in Malaysia.

Results concluded that economic growth has increased life expectancy. Exports and imports both have a positive impact on life expectancy. A few authors Cyluset *al.* [8] compare health system efficiency using the DEA technique. They applied DEA {output orientation model}. Some authors i.e. Korkmaz&Kulunk [9], Khodabakhshi [10] examined the relationship between higher education, Human development indicators, life expectancy at birth and economic growth. Findings of [9] show that unidirectional causality from economic growth to the schooling rate as well as from economic growth to life expectancy at birth. Results of [10] show that per capita GDP in the economy has good growth and human development indicators have low growth in a country. Some studies have a focus on economic development indicators with human development indicators i.e. Gorka [11] focused on the relevance citation for the economic indicators (GDP, GNI, Inflation, Unemployment, and Per Capita Income)

with that of social indicators (Literacy Rate, Poverty Rate, Health Index, education index).

In this way, this study is trying to find a relationship between tax revenue and the life expectancy index of select countries.

## Material and Methods

### • Objective of the study

The objective of this study is to explore the Interrelationship between the Tax Revenue and Life Expectancy (Health) Index of select Countries.

### • Hypothesis

Mostly a review of literature analyses the relationship of GDP, HDI, Government spending, consumption with tax revenue. Edame&Okoi [2], Ahmad *et al.* [3] etc. found a negative correlation between the level of investment and GDP with Taxation. Although so many factors are affecting to decide the life expectancy index to a particular country yet here an attempt has been to find a relationship between tax revenue and life expectancy index. Hence before analysing the fact an assumption is made that there is no significant relationship between Tax Revenue collected and Life Expectancy Index. Because so many other factors are also responsible to decide Life Expectancy

of a particular country. To keeping this fact in mind the following hypothesis have been developed;

There is no significant relationship between Tax Revenue collected and the Life Expectancy(Health) Index of select countries.

- **Data Collection procedure**

In order to determine the sample size for the present research work, GDP of 195 countries have been examined and sample size determination formula has been used. As per the formula results, 5 sample countries have been considered. After analysing the size of GDP in terms of value, it is found that France, Italy, Brazil, and Canada are having more or less equal GDP to India. These countries' percentage share in total world GDP is France (3.31%), Italy (2.49%), Brazil (2.42%), Canada (2.12%) and India (2.86%). Finally 5 countries France, Italy, Brazil, Canada and India have been selected as a sample for present research work. The reason for the selection of these countries other than India is that their GDP value is nearby India's GDP value. GDP data of 195 countries have been retrieved from the World Development Indicators Database Report, World Bank. In order to achieve

the objective of the present research work, data have been collected through secondary sources. Data of Life Expectancy at Birth Index (Health Index) is collected from UNDP (United Nations Development Programme) reports. Data on Tax Revenue of select countries (France, Italy, Brazil, Canada and India) have been collected from [www.stats.oecd.org](http://www.stats.oecd.org), [International Monetary Fund \(IMF\)](http://www.imf.org) and ACE Knowledge Portal (ACEKP). For this study, 2013 – 2018 data have been considered.

- **Statistical Tools and Techniques**

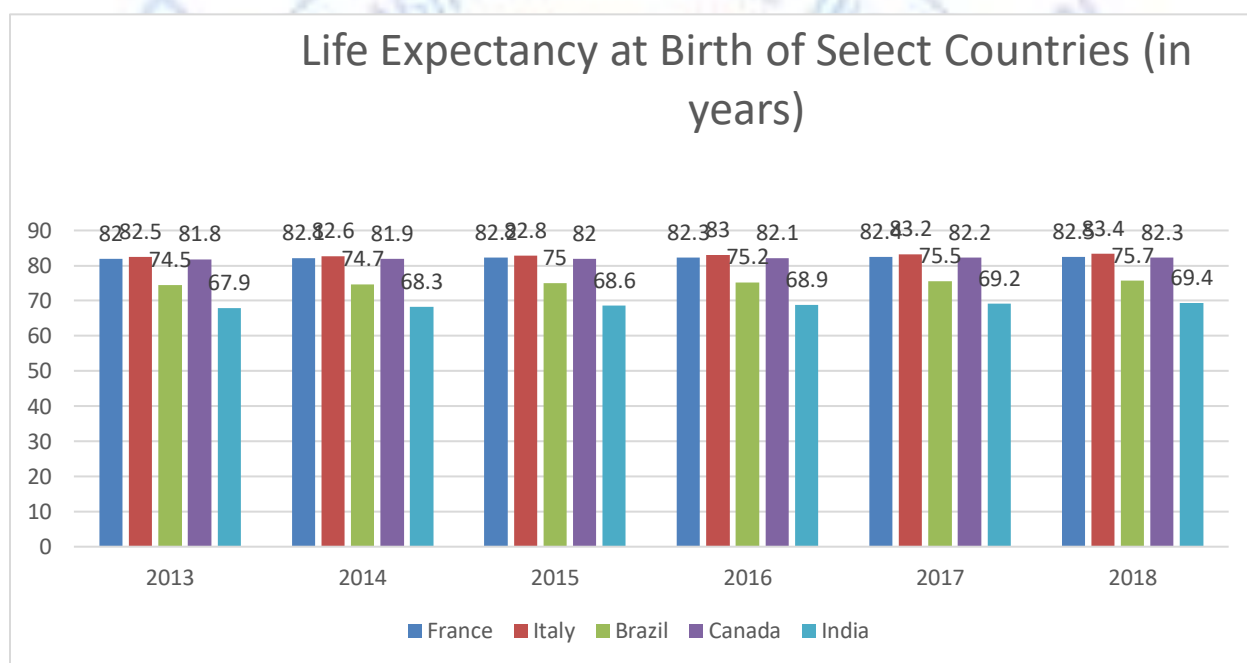
In order to achieve the objective of present research work, Correlation have been administered. For testing the hypothesis, 't' test have been administered. In order to develop a prediction model, Regression analysis is used.

### **Result and Discussions**

Table 1 shows a comparison of Life Expectancy at Birth of select five countries for the period of 2013-2018. Life expectancy at birth is a number of year person can expect to live. This table shows that the highest average life expectancy at birth observed in Italy that is 82.91 in years and the lowest life expectancy at birth observed in India that is 68.71 in years.

**Table: 1 Comparison of Life Expectancy at Birth of select countries (in years)**

Year	France	Italy	Brazil	Canada	India
2013	82	82.5	74.5	81.8	67.9
2014	82.1	82.6	74.7	81.9	68.3
2015	82.2	82.8	75	82	68.6
2016	82.3	83	75.2	82.1	68.9
2017	82.4	83.2	75.5	82.2	69.2
2018	82.5	83.4	75.7	82.3	69.4
<b>Average</b>	<b>82.25</b>	<b>82.91</b>	<b>75.1</b>	<b>82.05</b>	<b>68.71</b>



**Examine Interrelationship between Tax Revenue and Life Expectancy (Health) Index of select Countries**

In order to examine the inter-relationship between tax revenue and life expectancy (Health) Index, Correlation has been calculated. The table 2 shows the correlation between tax revenue collected and the life

expectancy (Health) index of select countries. In order to test the hypothesis, there is no interrelationship between tax revenue collected and the life expectancy (Health) index of select countries, a t-test has been used.

**Table: 2 Correlation between Tax Revenue and Life Expectancy (Health) Index of select countries**

Year	India		France		Italy		Brazil		Canada	
	Tax Revenue	Life Expectancy (Health) Index	Tax Revenue	Life Expectancy (Health) Index	Tax Revenue	Life Expectancy (Health) Index	Tax Revenue	Life Expectancy (Health) Index	Tax Revenue	Life Expectancy (Health) Index
2013	18,46,545	0.737	9,66,817	0.954	7,06,829	0.961	17,26,353	0.838	5,92,206	0.951
2014	20,20,728	0.743	9,83,465	0.956	7,05,075	0.964	18,30,531	0.842	6,23,732	0.953
2015	22,97,101	0.748	10,02,131	0.957	7,08,768	0.967	19,13,555	0.846	6,53,264	0.954
2016	26,22,145	0.752	10,20,206	0.959	7,14,911	0.969	20,11,724	0.85	6,72,809	0.956
2017	30,13,223	0.756	10,65,242	0.961	7,27,790	0.972	21,18,464	0.853	7,02,704	0.957
2018	34,94,102	0.76	10,91,541	0.962	7,38,820	0.975	26,17,395	0.857	7,32,087	0.959
<b>Correlation (r)</b>	<b>0.97148427</b>		<b>0.981240089</b>		<b>0.925855934</b>		<b>0.912321519</b>		<b>0.993836589</b>	
<b>(R<sup>2</sup>)</b>	0.943781804		0.962671		0.857209		0.832331		0.987711	
<b>'t' computed value</b>	9.997798426		51.87828		130.16879		15.7971		31.72552	
<b>'t' table value (5%)</b>	2.228138852		2.228138852		2.228138852		2.228138852		2.228138852	
<b>P value</b>	1.59276E-06		1.71E-13		1.757E-17		2.12E-08		2.28E-11	
<b>'t' test result</b>	<b>Significant</b>		<b>Significant</b>		<b>Significant</b>		<b>Significant</b>		<b>Significant</b>	

Source: Own Calculation on Ms-Excel 2013

Table 2 shows the interrelationship between tax revenue and the life expectancy index of select countries. For check, interrelationship correlation has been used. Results show that all country's tax revenue and life expectancy index are highly correlated. The result of table 2 shows

that in India, the tax revenue collected and life expectancy index correlation is 0.9714 it means both are very highly positively correlated. Positive correlation shows that when tax revenue is increased, the life expectancy index will be increased because the government spends tax

revenue funds on the health of the countries people. Salome, *et al.* [12] also examined the effect of tax revenues on economic development (human development index & its indicators). This study also found that tax revenues have a positive correlation with the Human development index. Hassan, *et al.* [13] examined the relationship between life expectancy rate (as a proxy for health status) with health expenditure. The empirical results from this study showed a positive relationship between life expectancy rate and health expenditure. In this context, in the present study relationship between tax revenue and life expectancy index has been established for testing the hypothesis that there is a no inter-relationship between tax revenue collected and the life expectancy index of India, 't' test has been administered. Result of 't' test for India shows that 't' table value 2.22 is less than 't' computed value that is 9.99 at 5% level of significance it indicated that hypothesis have been rejected and p-value is less than 0.05 it shows that relationship exists between tax revenue and life expectancy index in India. Results also indicated that in all four countries i.e. France, Italy, Brazil, Canada tax revenue and life expectancy index are highly correlated. In all

four countries, t table value less than t computed value at a 5% level of significance shows that there is a relationship exists between tax revenue and life expectancy index of a country. Result show strong positive correlation exist between tax revenue collected and life expectancy index of all selected countries i.e. India, France, Italy, Brazil and Canada.

### **Development of Country-Wise Prediction Model for Estimating Life Expectancy Index**

For the development of the prediction model of life expectancy (Health) index on the basis of tax revenue of select five countries, regression analysis has been administered. In past literature, some similar studies i.e. Ibanichuka *et al.* [14], Lawal & Abdulkadir [15], Shah [16], Sharma & Kaur [17] also adopted regression technique for prediction and establishing the relationship, hence in this study we have adopted simple linear regression technique. All five countries' regression prediction models summarised in the following.

- **India**

The table 3 shows the regression prediction result of the life expectancy index for India.

**Table: 3 Regression Output of Prediction model of India's Life Expectancy (Health) Index**

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.7157187	0.004203395	170.2716	7.14E-09

TAX REVENUE	1.32E-08	1.60929E-09	8.194592	0.001208
R Square	0.943781804	F-Statistic		67.15134
Adjusted R Square	0.929727256	Significance F		0.001208
Standard Error	0.00224728			
<b>Regression Equation of Prediction Model</b>				
Life Expectancy Index (y) = Constant (a) + βIn TR (bx)				
β – Regression Coefficient				
<b>Life Expectancy Index India = 0.7157 + 1.32E-08*TR-----Regression Equation</b>				
Life Expectancy Index (y) = Dependent Variable				
Tax Revenue (x) = Independent Variable				

Source: Own Calculation through Ms-Excel 2013

The table 3 shows the regression output for the prediction of the life expectancy index for India. The result shows the intercept value i.e. 0.7157 is statistically significant because its t statistics is more than t table value at a 5% level of significance. Tax revenue value 1.32E-08 is also significant because its t statistics is more than t table value. The p-value of both variables is less than 0.05 it means values are significant. The coefficient of determination  $r^2$  is 0.9437 it means 94.37% of the variability in the life expectancy Index have influenced by the Tax Revenue. Hence 5.63% variability in life expectancy Index has explained by other factors outside tax revenue. The F statistics 67.151 shows the overall significance of the regression model.

Therefore, the tax revenue has a positive and significant influence on the life expectancy index thus tax revenue is an important instrument for economic development in India. The above equation shows the regression model for the prediction of life expectancy index on the basis of tax revenue. In this equation, the life expectancy index is the dependent variable and tax revenue is the independent variable.

- **France**

For the development of the prediction model of life expectancy (Health) index of France again regression analysis has been administered. The table 4 shows the regression prediction result of the life expectancy index for France.



**Table: 4 Regression Output of prediction model for France’s Life Expectancy (Health) Index**

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.894569	0.006268	142.7295	1.45E-08
TAX REVENUE	6.23E-08	6.13E-09	10.15652	0.000529
R Square	0.962671	F-Statistic		103.1549
Adjusted R Square	0.953339	Significance F		0.000529
Standard Error	0.000661			
<b>Estimated Life Expectancy Index of France = 0.8945 + 6.23E-08*TR -----Regression Equation</b>				

**Source: Own Calculation through Ms-Excel 2013**

The table 4 shows the regression output for the prediction of the life expectancy index for France. The result shows the intercept value i.e. 0.8945 it is statistically significant because its t statistics is more than t table value at 5% level of significance. Tax revenue value 6.23E-08 is also significant because its t statistics is more than t table value. The p-value of both variables is less than 0.05 it means values are significant. The coefficient of determination  $r^2$  is 0.9626 it means 96.26% of the variability in the life expectancy Index have influenced by the Tax Revenue.

Hence 3.74% variability in life expectancy Index has explained by other factors outside tax revenue. The above equation shows the regression model for the prediction of life expectancy index on the basis of tax revenue.

• **Italy**

For the development of the prediction model of life expectancy (Health) index for Italy again regression analysis has been administered. The table 5 shows the regression prediction result of the life expectancy index for Italy.

**Table: 5 Regression Output of prediction model for Italy’s Life Expectancy (Health) Index**

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.715199918	0.051596229	13.8614764	0.000157034
TAX REVENUE	3.52564E-07	7.19474E-08	4.900307283	0.008042216
R Square	0.857209211	F-Statistic		24.01301147

Adjusted R Square	0.821511514	Significance F	0.008042216
Standard Error	0.002170736		
<b>Estimated Life Expectancy Index of Italy = 0.715199 + 3.52564E-07 *TR -----</b>			
<b>Regression Equation</b>			

**Source: Own Calculation through Ms-Excel 2013**

The table 5 shows the regression output for the prediction of life expectancy (health) index for Italy. The result shows the intercept value i.e. 0.7151 is statistically significant because its t statistics is more than t table value at 5% level of significance. Tax revenue value 3.52564E-07 is also significant because its t statistics is more than t table value. The p-value of both variables is less than 0.05 it means values are significant. The coefficient of determination  $r^2$  is 0.8572 it means 85.72% of the variability in life

expectancy (Health) Index has influenced by the Tax Revenue. Hence, 14.28% variability in the life expectancy (Health) Index has explained by other factors outside tax revenue.

• **Brazil**

For the development of the prediction model of life expectancy (Health) index of Brazil again regression analysis has been administered. The table 6 shows the regression prediction result of the life expectancy index for Brazil.

**Table: 6 Regression Output of prediction model for Brazil’s Life Expectancy (Health) Index**

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.806118212	0.009416982	85.6026	1.12E-07
TAX REVENUE	2.04035E-08	4.57883E-09	4.45606	0.0111943
R Square	0.832330554	F-Statistic		19.856463
Adjusted R Square	0.790413192	Significance F		0.0111943
Standard Error	0.003232862			
<b>Estimated Life Expectancy Index of Brazil = 0.806118 + 2.04035E-08* TR -----</b>				
<b>--Regression Equation</b>				

**Source: Own Calculation through Ms-Excel 2013**

The table 6 shows the regression output for the prediction of health index for Brazil. The result shows the intercept value i.e. 0.8061 it is

statistically significant because its t statistics is more than t table value at 5% level of significance. Tax revenue value 3.61E-08 is also

significant because its t statistics is more than t table value. The p-value of both variables is less than 0.05 it means values are significant. The coefficient of determination  $r^2$  is 0.8323 it means 83.23% of the variability in life expectancy (Health) Index have influenced by the Tax Revenue. Hence, 16.77% variability in life expectancy (Health) Index has explained by other factors outside tax revenue.

• **Canada**

For the development of the prediction model of life expectancy (Health) index of Canada again regression analysis has been administered. The table 7 shows the regression prediction result of the life expectancy index for Canada.

**Table: 7 Regression Output of Prediction Model for Canada’s Life Expectancy (Health)Index**

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.917693165	0.00208581	439.969624	1.6012E-10
TAX REVENUE	5.62867E-08	3.13918E-09	17.9303862	5.6864E-05
R Square	0.987711166	F-Statistic		321.498751
Adjusted R Square	0.984638958	Significance F		5.6864E-05
Standard Error	0.000359211			
<b>Life Expectancy Index of Canada = 0.917693 + 5.62867E-08* TR -----</b>				
<b>Regression Equation</b>				

**Source: Own Calculation through Ms-Excel 2013**

The table 7 show the regression output for the prediction of health index for Canada. The result of the table show intercept value i.e. 0.9176 is statistically significant because its t statistics is more than t table value at 5% level of significance. Tax revenue value 5.62867E-08 is also significant because its t statistics is more than t table value. The p-value of both variables is less than 0.05 it means values are significant. The coefficient of determination  $r^2$  is 0.98.77 it means 98.77% variability in life expectancy

(Health) Index has influenced by the Tax Revenue. Hence 1.23% variability in life expectancy (Health) Index has explained by other factors outside tax revenue.

**Validity of Regression Model for all select countries**

In order to check the validity of the regression model for all select countries developed by us the predicated life expectancy index has been calculated by applying their own developed models. The results are given in the following table no. 8.

Countries	India			France			Italy			Brazil			Canada		
Year (a)	Actual life Expectancy Index (b)	Predicted Life Expectancy Index ©	Square of mean difference = (b-c)²	Actual life Expectancy Index (b¹)	Predicted Life Expectancy Index (c¹)	Square of mean difference (d¹) = (b¹-c¹)²	Actual life Expectancy Index (b²)	Predicted Life Expectancy Index (c²)	Square of mean difference (d²) = (b²-c²)²	Actual life Expectancy Index (b³)	Predicted Life Expectancy Index (c³)	Square of mean difference (d³) = (b³-c³)²	Actual life Expectancy Index (b⁴)	Predicted Life Expectancy Index (c⁴)	Square of mean difference (d⁴) = (b⁴-c⁴)²
2013	0.737	0.74¹	9E-06	0.954	0.955	5.75E-07	0.961	0.964	1.16E-05	0.838	0.841	1.12E-05	0.951	0.951	7.01E-10
2014	0.743	0.742	0.00001	0.956	0.956	4.22E-08	0.964	0.964	4.65E-08	0.842	0.843	2.15E-06	0.953	0.953	3.96E-08
2015	0.748	0.746	4E-06	0.957	0.957	1.88E-09	0.967	0.965	3.66E-06	0.846	0.845	7.03E-07	0.954	0.954	2.15E-07
2016	0.752	0.75	4E-06	0.959	0.958	8.43E-07	0.969	0.967	3.06E-06	0.85	0.847	8.04E-06	0.956	0.956	1.91E-07
2017	0.756	0.755	0.00001	0.961	0.961	1.31E-08	0.972	0.972	4.29E-08	0.853	0.849	1.34E-05	0.957	0.957	6.05E-08
2018	0.76	0.761	0.00001	0.962	0.963	2.73E-07	0.975	0.976	4.64E-07	0.857	0.860	6.36E-06	0.959	0.959	1.00E-08
<b>Average</b>	0.749	0.749	<b>3.33E-06</b>	0.9582	0.9582	2.91E-07	<b>0.968</b>	<b>0.968</b>	<b>3.14E-06</b>	<b>0.848</b>	<b>0.848</b>	<b>6.97E-06</b>	<b>0.955</b>	<b>0.955</b>	<b>8.60E-08</b>
<i>t Stat</i>	0.07004835			6.34263E-14			0			2.84498E-14			0		
<i>t Critical two-tail</i>	2.228138852			2.228138852			2.228138852			2.228138852			2.228138852		
<i>p value</i>	0.945536191			1			1			1			1		
<i>Result</i>	Not significant			Not significant			Not significant			Not significant			Not significant		

Source: Own Calculation through Ms-Excel 2013

¹Calculation of predicted Life Expectancy Index in 2013 for India  
 Tax Revenue in 2013 = 1846545  
 Actual Life Expectancy Index = 0.737  
 Regression Equation = 0.7157 + 1.32E-08\*TR  
 Predicted Life Expectancy Index = 0.7157 + 1.32E-08\*1846545 = 0.74

Now it has to be checked whether any significant difference exists between the actual and predicted life expectancy index of select countries. The above table shows the actual and predicted life expectancy index for all select countries. For checking the significant difference between actual and predicted expectancy index t-test has been applied. The result of the t-test for all countries shows that t statistics value is less than t table value 2.22 it means there is no significant difference between actual and predicted life expectancy index. The p-

value for all countries is more than 0.05 it is also evidence that there is no significant difference between the actual and predicted life expectancy index. The prediction model for all select countries i.e. India, France, Italy, Brazil and Canada developed by us is significant.

**Selection of Best Regression Prediction Model**

Now, to identify the best model for prediction for the life expectancy index from select countries, the comparison has been made in the table no. 9.

**Table: 9 Best Regression Model for prediction of Life Expectancy (Health) Index in all Countries**

Countries	India	France	Italy	Brazil	Canada
Square of Mean difference	0.0000038	0.000000291375	0.0000031414	0.0000069676	0.0000000860218

**Source: Own Calculation through Ms-Excel 2013**

Table 9 shows the average values of (square of the mean difference) of the actual life expectancy index and predicted life expectancy index. The table shows that the best prediction model will be of that country whose square of the mean value is lowest. The result shows that Canada’s square of the mean value is 8.60218E-08 which is the lowest value in all of the country’s square of mean values. The result

shows Canada’s life expectancy index prediction model is the best prediction model in all country’s prediction model.

**All Countries Regression Prediction Model developed by us:**

The table 10 shows a summary of select all countries’ regression prediction models for estimation of the Life Expectancy (Health) Index.

**Table: 10 All Countries Regression Prediction Model at a Glance**

S. No.	Country	Regression Prediction Model
1.	India	Life Expectancy (Health) Index = $0.7157 + 1.32E-08*TR$
2.	France	Life Expectancy(Health) Index = $0.8945 + 6.23E-08*TR$
3.	Italy	Life Expectancy (Health)Index = $0.715199 + 3.52564E-07*TR$
4.	Brazil	Life Expectancy (Health)Index = $0.806118 + 2.04035E-08*TR$
5.	Canada	Life Expectancy (Health)Index = $0.917693 + 5.62867E-08*TR$

*Source: Own Calculation through Ms-Excel 2013*

### Conclusion and Recommendations

The life expectancy index of a particular country depends upon the health of a person. Results of Vatavu, *et al.* [18] show that a positive relationship between human development & taxes is associated with longer life expectancy, which is related to higher government spending's, better welfare systems and therefore increased levels of taxation. The relationship between tax revenue and life expectancy index of France, Italy, Brazil, Canada and India has been explored through correlation statistical technique. Our study showed that there is a high positive correlation (more than 0.75) between tax revenue collected and the life expectancy index throughout the study period. It is also proved by the t-test. The regression model has been developed for all select countries. In all five countries, the results of the t-test show that the regression prediction model have been significant and the difference between actual life expectancy index and the predicted life

expectancy index is not significant, it clearly indicates that the model developed by us is significant. It can be applied anywhere in the real world of life. The result found that Canada's prediction model for the life expectancy index is the best prediction model. These all countries' prediction model can be used to identify a particular target of life expectancy and also how much tax revenue will be required for enhancing a life expectancy.

The regression model shall help to the countries in order to decide the quantum of budgeted tax revenue required to achieve a particular life expectancy age. A universal regression model has also been developed along with country-specific models. Hence such a model can be used by other than sample countries in order to identify the required tax revenue. While preparing the budget the countries facing the problem of determination of amount which is allocated to a particular head like, health

expenditure. To resolve this problem the developed regression model can be used.

### Limitations

- In the present article, only one factor has been considered i.e. Tax Revenue for deciding the life expectancy index of a country on the basis of a review of literature. But in actual so many factors i.e. tax revenue, pollution, environment, happiness, GDP, good access to the hospital, health expenditure etc. are also to be considered in order to decide life expectancy in a particular country [19,20,21].
- In the present time, a huge number of factors are responsible for determining life expectancy. In order to determine the life expectancy of a country, some other factors will also be considered using the factor analysis technique.
- In the present study, only 5 countries have been considered for identifying relationships, in future study other countries can also be considered

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