THE BALANCE OF GROWTH AND DEVELOPMENT:SIAMESE TWINS?

Prof.SwahaShome*

Prof. Davinder Suri*

Abstract:

Economic growth of a country is defined by an increase in its output which is measured by calculating the Gross Domestic Product (GDP).It is now increasingly recognized that the economic growth of a country is meaningful only when it simultaneously secures the well- being of its citizens. The Human Development Index (HDI), published by the United Nations Development Programme, can be used to judge the state of any economy so far as its development and social wellbeing is considered.The growth of an economy normally precedes its social development and one would expect that a country would eventually realize both economic and social well- being. All countries are now ranked by its economic prosperity as well as their development levels. It is however true for many countries that the rankings are not correlated. This paper seeks to examine this relationship for the top twenty economies in the world. In order to test the above, the paper has used Spearman's Rank Correlation between GDP and HDI ranks of the top 20 countries as per their GDP rank. It is found that there exists a significant rank correlation for 17 out of the top 20 countries between their GDP and HDI ranks.

Key words: Economic growth, GDP, HDI,Spearman's rank correlation, well-being

* Faculty in Economics, IBS Mumbai

Section 1: Introduction

Economic growth of a country is defined by an increase in its output which is measured by calculating the Gross Domestic Product (GDP). The economic development on the other hand is much wider. It reflects the social wellbeing of the economy and is an indicator of the quality of life led by the citizens of the economy. The two terms referred to above jointly culminate in both economic and social development. Development leads to improvements in indicators such as literacy rates, health conditions, and poverty rates. A quantitative measure of GDP does not take into account these factors and hence it is possible that the two indices diverge.. It is often believed that economic growth can only be a precursor to economic development and the latter can happen only with adequate growth.Higher levels of output can be redirected into higher spending on education, health and poverty alleviation which will eventually improve the well-being of the citizens. A scenario of growth without development is neither sustainable nor desired.

Section 2: GDP and HDI

In order to examine the balance between growth and development for a country, two indicators have been selected viz. GDP and the HDI. The Gross Domestic Product (GDP) is the most widely-used measure of the overall economic activity and is viewed as a measure of a country's fundamental economic health. . Paul Samuelson, Nobel Laureate and author describes GDP as “truly among the great inventions of the 20th century, a beacon that helps policymakers steer the economy toward key economic objectives”.GDP of a country can be defined as the value of the total final output of all goods and services produced in a single year within a country's boundaries. As an aggregate measure of total economic production for a country, GDP can be also calculated as a sum of personal consumption, government purchases, private inventories, paid-in construction costs and the foreign trade balance.

The nominal value of GDP indicates that the all the goods and services are value of everything produced in a country at the prices prevailing in that country. In order to compare between countries, the GDP is converted into U.S. Dollars at market exchange rates. The following table shows the ranking of countries by their GDP by IMF and the United Nations.

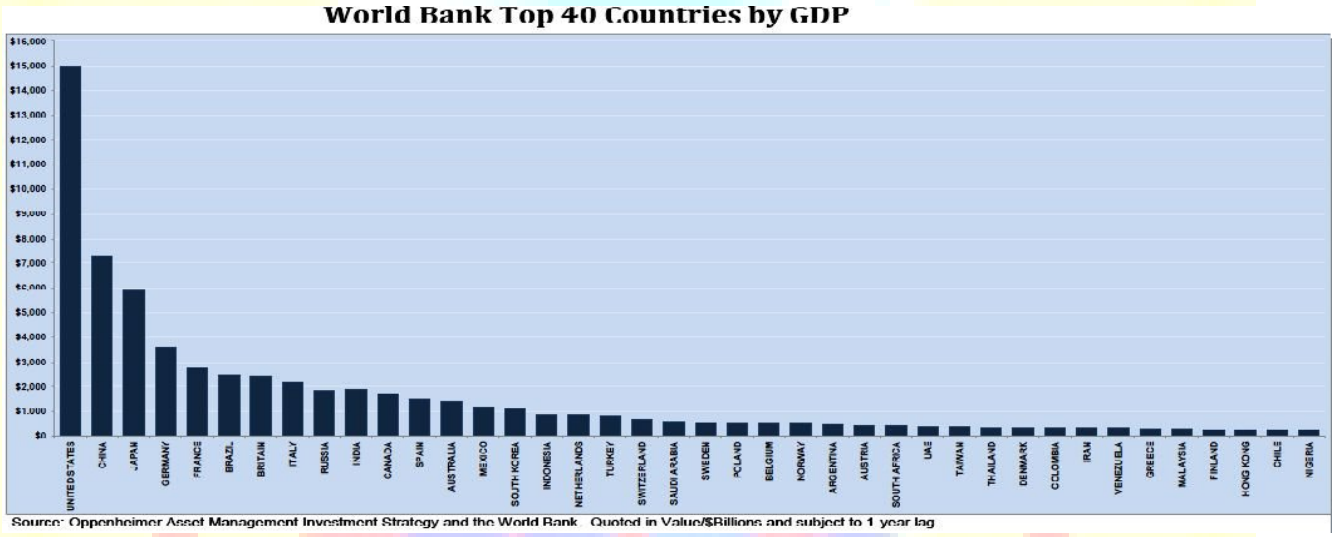
Asian industrialization has been outpacing Western economies for years, and is expected to continue to do so over the next several decades.With the aim to foster growth and development amongst the economies, the International Monetary Fund, the United Nations and the World Bank, rank the economies by GDP. The following table shows the ranking of countries by their GDP by IMF and the United Nations

List by the United Nations (2012)			List by the International Monetary Fund (2012)		
Rank	Country/Region	GDP (Millions of $US)	Rank	Country/Region	GDP (Millions of $US)
	World	72,689,734		World	72,216,373
1	United States	16,244,600	1	United States	16,244,575
2	China	8,358,400	2	China	8,221,015
3	Japan	5,960,180	3	Japan	5,960,269
4	Germany	3,425,956	4	Germany	3,429,519
5	France	2,611,221	5	France	2,613,936
6	United Kingdom	2,417,600	6	United Kingdom	2,476,665
7	Brazil	2,254,109	7	Brazil	2,253,090
8	Russia	2,029,812	8	Russia	2,029,813
9	Italy	2,013,392	9	Italy	2,014,078
10	India	1,875,213	10	India	1,841,717
11	Canada	1,821,445	11	Canada	1,821,445
12	Australia	1,564,419	12	Australia	1,541,700
13	Spain	1,322,126	13	Spain	1,323,500
14	Mexico	1,183,655	14	Mexico	1,177,398
15	South Korea	1,129,598	15	South Korea	1,129,536
16	Indonesia	878,043	16	Indonesia	878,536
17	Turkey	788,299	17	Turkey	788,299

18	Netherlands	770,067		18	Netherlands	770,867
19	Saudi Arabia	711,050		19	Saudi Arabia	711,050
20	Switzerland	631,183		20	Switzerland	631,183

Table1: List of countries by GDP rank

Source: United Nations and International Monetary Fund official websites



Graph 1: World Bank Top 40 countries by GDP

The United States is the world's largest single national economy estimated to be $17.1 trillion in December 2013. The United States has been the world's largest national economy since at least the 1920s. The United States has led this ranking for at least a century owing to the diversity of the its economy as well as its reputation for superior products and producing a fifth of the entire world's manufacturing output. The US's major industries include petroleum, mining, food processing, aerospace, and information technology. The U.S. is also considered to be the most influential and largest financial markets in the world. The US's economic growth rate is 2.2% annually. China trails the US at No. 2, and is widely acknowledged to be on track to take over as the world's largest economy by 2023. China's GDP

is close to $9.0 trillion being the fastest growing economy with average annual growth rates of 10%. Next, Japan with $ 5.1 trillion GDP is one of the most technologically advanced economies in the world with its major contributions in the industrial and electronic sectors and automotive, semiconductors, and processed foods industries adding to its tally. Germany is Europe's largest economy with GDP $3.6 trillion, the second largest exporter in the world with contributions from automotive, electric equipment sectors. At fifth position is France with GDP $2.7 trillion. It has been one of the most developed and wealthiest economies in the world;more than 30 of the world's 500 biggest companies are French and the location of the headquarters of most of the Fortune Global 500 companies.Brazil is South America's largest economy and the second biggest economy in the western hemisphere with GDP $2.5 trillion. The country's strength lies in agriculture, mining, manufacturing, and service. Brazil is followed by the U.K.,with a GDP $2.4 trillion attributed to healthy agriculture, electronics and manufacturing industries besides being a leading financial and political power in Europe. Russia stands at eight position with GDP $2.2 trillion. Russia privatized most of its industries and made the economy more globally integrated and market-oriented along with Russia also beinga leading oil producer in the world. Italy with GDP $2.1 trillion relies on its industrial sectors for his high per capita GDP. Italy also benefits from membership in several groups of the wealthiest economies. The last in the first ten countries is India with GDP $2 trillion contributed by major industries like agriculture, and services including information technology and the outsourcing of business from other countries.

Amongst the next ten economies, six economies: Canada, Australia, Spain, South Korea, Netherlands and Switzerland are advanced economies and four are emerging economies: Mexico, Indonesia, Turkey and Saudi Arabia.

Human development is defined as the process of increasing people's freedoms and opportunities and improving their well-being. It is a direct outcome of better education, better health and improved lifestyle.The Human Development Index (HDI was created by the Pakistani economist Mahmud ulHaqand the Indian economist AmartyaSen in 1990 and was published by the United Nations Development Programme. This index can be used to judge the state of any economy so far as its development and social wellbeing is considered. UNDP ranks all economies according to this index. In effect the HDI is a better criterion for the performance of an economy rather than just economic growth.All countries included in the HDI are classified into one of three clusters of achievement in human development: high human development (with

an HDI of 0.800 or above), medium human development (HDI of 0.500–0.799) and low human development (HDI of less than 0.500).

The human development index is a composite index of three parameters i.e. life expectancy, GDP per capita and education. Life expectancy refers to the number of years a newborn would live. It is a direct outcome of the health facilities available in the economy. GDP per capita is calculated by dividing GDP by the population and education index is based on adult literacy rate and the combined GER for primary, secondary and tertiary education.

Section 3: Literature review:

Human development approach takes its roots from Sen (1995) where he speaks of human capabilities. This approach was further developed by Nussbaum (2000) and Robeyns (2005). Since its publication the HDI index has received tremendous response as an objective of economic policy and replaced the earlier objective of economic growth. Despite the strong policy implications of the relationship between economic growth and human development, there are only a few studies on the two-way causation between them (Mayer-Foulkes, 2005; Ranis and Stewart, 2000; Sala-i-Martin, 2005; Suri et al., 2011). White and Anderson (2001) provide evidence of a trade- off between growth and distribution. The authors conclude that poor developing countries should concentrate on distribution rather than growth.

Development can also foster growth.Strauss and Thomas (1998) review a large literature documenting how improvements in health and nutrition improve productivity and incomes of the workers. In India, the per capita gross domestic production index despite having an upward trend has had little impact on other indicators of human development index such as life expectancy (Khodabakhshi, 2011).Natoli R and Zuhair S (2011) attempted to construct a progress measurement appropriate for measuring multiple and different dimensions of progress and applied the progress index to three countries, representative of different clusters viz. Australia (mid-industrialised nation), Mexico (emerging economy), and the US (highly industrialised nation). The results showed Australia as consistently having the highest levels of progress, closely followed by Mexico and then the US. These selected countries provide an opportunity to highlight any divergences that may exist in their perceived economic strength.HDI and its

disaggregated versions are important tools for policy makers in developing countries to identify the areas of strengths and weaknesses and address them accordingly (Haq K., 2007).

Section 4: Data and Methodology:

In order to determine whether the economies that were ranked as first 20 countries in terms of GDP had a high rank in HDI, the Spearman's Rank Correlation is used. All data for GDP has been taken from IMF site, and HDI data have been taken from the Human development report published by UNDP.

H0: The economies' GDP rank has no correlation to their HDI rank.

HI: There is significant correlation between GDP rank and HDI rank

Table 2: The calculation of the rank correlation.

Countries	GDPRANK	HDI	HDIRANK	d1	d1^2
China	2	101	18	-16	256
India	10	136	20	-10	100
Brazil	7	85	16	-9	81
United Kingdom	6	26	12	-6	36
Russian Federation	8	55	13	-5	25
France	5	20	9	-4	16
Japan	3	10	6	-3	9
Indonesia	16	121	19	-3	9
Italy	9	25	11	-2	4
United States	1	3	2	-1	1
Mexico	14	61	15	-1	1
Germany	4	5	4	0	0
Turkey	17	90	17	0	0
Spain	13	23	10	3	9
Canada	11	11	7	4	16

Saudi Arabia	19	57	14	5	25
Korea, Rep.	15	12	8	7	49
Australia	12	2	1	11	121
Netherlands	18	4	3	15	225
Switzerland	20	9	5	15	225

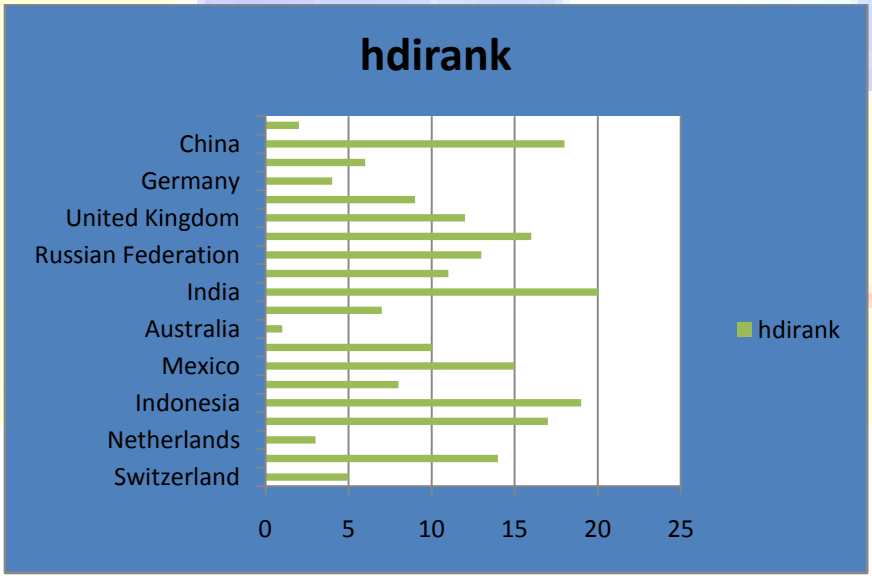
Rank Correlation I

Spearman's correlation: $\rho = 1 - \frac{6 * \sum d^2}{N * (N^2-1)}$

Spearman's correlation: $\rho = 0.0917 = 0.1$

The rank correlation is not only very low but also not significant at 10%, 5% and 1%. According to the above data, the analysis failed to reject the null hypothesis and the conclusion is that there is no significant correlation between GDP rank and HDI rank.

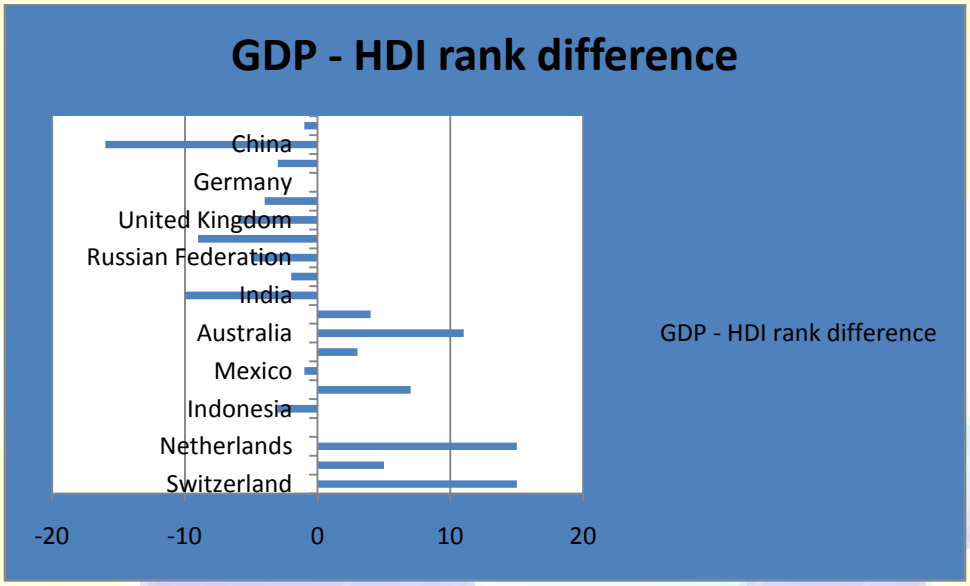
However on looking at the HDI rank data, the following observations were made:



Graph 2: HDI rank for top 20 countries ranked by GDP

In the above graph, the countries have been arranged from the top in descending order of their GDP rank from United States having rank 1 to Switzerland having GDP rank 20. The HDI

rank is the green bar showing ranks from 1 to 20 for the twenty countries. The graph shows that India has HDI rank 20, hence India is the lowest amongst the 20 countries group in terms HDI ranking. Marginally better on the HDI rankings than India are Indonesia and China. The economy that boasts of a smaller bar for HDI can boast to be higher on HDI rankings. Hence, from the above graph it is clear that Australia tops the ranking for HDI followed by United States and Netherlands.



Graph 3: GDP – HDI rank difference for top 20 countries ranked by GDP

In the above graph again on the Y axis countries have been arranged according to their GDP rank. The graph depicts the difference in GDP rank and HDI rank for each countries. Lower the difference shows that the country is similar in terms of GDP rank and HDI rank and a lower difference in ranks shows higher rank correlation. Higher the difference means that the country varies in terms of the two ranks. Further a positive difference shows that the country has a higher HDI rank than its world GDP rank and negative shows that the country has a better GDP rank as compared to its HDI rank.

China ranks second in GDP and eighteen in terms of HDI rank hence has the highest negative ranks difference while countries such as Netherlands and Switzerland being small economies are lower in GDP rank but very high on HDI rank which makes the rank difference high again but a

positive difference.Since China, Netherlands and Switzerland had large rank differences, their observations were responsible for the low correlations and can be considered outliers.

Rank Correlation II

The second test for Spearman's Rank correlation was attempted but with only 17 observations without data for Netherlands, Switzerland and China.

Spearman's correlation: $\rho = 1 - \frac{6 * \sum d^2}{N * (N^2-1)}$

Spearman's correlation: $\rho = 0.490196$ significant at 10% and 5%.

Hence the null hypothesis has been rejected for the dataset comprising 17 observations i.e. for 17 out of the top 20 economies by GDP rank there is exists significant rank correlation with its HDI rank.

In the China National Human Development report, created by Li Shi in 1995, it is revealed that the rank correlation between China's provincial GDP and HDI ranking is close to 0.9 suggesting that the poorer regions of China have little or no development. There is thus a need for removing the disparity in development amongst the provinces for which a larger public spending is required in the poorer provinces. By contrast the economies of Netherlands and Switzerland have fully realized their possibility of social well- being despite being a small economy.

Section 5: Conclusion

The above results indicate that although there exists no correlation between GDP rank and HDI rank in the top twenty countries of the world, in seventeen out of the twenty countries there does exist a correlation. In other words as the economy grows bigger it is likely that more resources would be devoted to education, health and infrastructure, thus improving the social well- being of all the citizens.

References:

Alkire, Sabina (2002). Dimensions of Human Development, World Development Vol. 30, No. 2, pp. 181-205

Anand, Sudhir and Amartya Sen (2000). The Income Component of the Human Development Index, Journal of Human Development, Vol. 1, No. 1, 2000

Birdsall, N., Ross, D., & Sabot, R. (1995). Inequality and growth reconsidered: lessons from East Asia. World Bank Economic Review, 9

Bhanoji Rao, V.V. (1991). Human Development Report 1990: Review and Assessment, World Development, Vol. 19, No. 10, pp. 1451-1460

Castles, Ian (1998). The Mismeasure of Nations: A Review Essay Population and Development Review, Vol 24, No. 4

Emerson, R., South East Asia - Long Road Ahead, Chapter 2

Hastings, D. (2002) Filling gaps in the Human Development index - findings from Asia and the Pacific, UNESCAP working paper

Haq K, 2007, 'Human Development Index and Its Relevance for Developing countries', Speech at the Foreign Service Academy

Islam, S. (1995) The human development index and per capita GDP, Applied Economics Letters, 2(5), pp.166-167

Khodabakhshi A, 2011, 'Relationship between GDP and Human Development Indices in India', International Journal of Trade, Economics and Finance, Vol. 2, No. 3, June 2011

Luchters, G. (2000) Chaotic Signals from HDI Measurement, Applied Economics Letters, 7(4), pp.267-270

Natoli R and Zuhair S, 2011, 'Measuring Progress: A Comparison of the GDP, HDI, GS and the RIE', Social Indicators Research, Volume 103, Issue 1, pp 33-56

Ranis, Gustav and Frances Stewart (2001). Growth and Human Development: Comparative Latin American Experience, Yale University Economic Growth Center Discussion Paper 826

Ranis, Gustav and Frances Stewart (2000). Strategies for Success in Human Development, Journal of Human Development, Vol. 1, No. 1

Ranis, Gustav, Frances Stewart and Alejandro Ramires (2000). Economic Growth and Human Development, World Development Vol. 28, No. 2

Spearman's Rank-order Correlation -- Analysis of the Relationship Between Two Quantitative Variables:http://psych.unl.edu/psycrs/handcomp/hcspear.PDF