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# Comparative study of Asian economies: lessons for India

Comparative  
study of Asian  
economies

Mamta Bhardwaj, Ajit Singh Naosekpm and Rupinder Tewari  
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## Abstract

**Purpose** – This paper represents a comparative study of five Asian countries, namely, Singapore, Taiwan, South Korea, China and India, based on the Global Competitiveness Index (GCI) 2015-2016 published by the World Economic Forum. The purpose of this study is to assess India's position vis-a-vis the various comparator Asian economies and to identify areas for improvement so as to enhance India's competitiveness.

**Design/methodology/approach** – The study is based on the comparisons and analysis of the ranks of each country. These ranks are based on the indicators related to three categories, i.e. "Basic Requirements", "Efficiency Enhancers" and "Innovation and Sophistication" Factors. The GCI included data from internationally recognised agencies such as the IMF, the WHO and the United Nations Educational, Scientific and Cultural Organization.

**Findings** – On the basis of the aforementioned comparisons among these five Asian economies, it was found that Singapore (Rank-2) has made stupendous economic progress and is amongst the top five successful economies of the world. Taiwan, South Korea and China also have taken significant economic strides and are ranked globally at 15, 26 and 28, respectively. India, on the other hand, is ranked 55 out of 140 nations.

**Research limitations/implications** – In this paper, the countries were compared on the basis of their rank in the GCI Report 2015-2016. For an in-depth and more holistic study, comparison can be done by taking into consideration other important reports and analysis in this regard.

**Originality/value** – This is an original study where the developments that have taken place in the five Asian economies have been analysed based on the GCI. Most importantly, this study identifies the area/indicator in which India needs to improve to be placed among the developed nations.

**Keywords** China, Taiwan, India, Singapore, Global Competitiveness Index Report, South Korea

**Paper type** Conceptual paper

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## Introduction

These Asian countries are progressing at a fast pace and becoming a significant part of the global economy. Countries like, Singapore, Taiwan and South Korea (S. Korea), despite being small in size and population, have made remarkable progress in various economic parameters, and they have leap-frogged into the category of "innovation-driven economy", which was earlier dominated by Western countries such as the USA, the UK, Germany, Canada and France. Singapore has been recognised as the world's leading international financial centre; Taiwan has become the largest importer and exporter of merchandise; and S. Korea has earned the reputation of being a leading manufacturer of information technology equipment. Global think-tanks perceive that in the near future, two other Asian countries, India and China, will be the leading economies of the world, as they have all the ingredients needed for becoming economically stable nations, e.g. ample natural resources, large land and coastal areas, abundant scientists and universities, many advanced research laboratories/institutions and a young workforce. China has reformed its economic policies and is quite serious in its implementation as well. India's economic policies and mode of governance have also been reformulated, but implementation of the policies needs a fresh impetus.



The comparison carried out in this study is based on various domains such as health, education, science and technology (S&T), infrastructure, marketing capability/capacity, legal framework, etc. For the purpose of this study, we have restricted ourselves to the data published by the World Economic Forum in the form of the Global Competitiveness Index (GCI) Report, 2015-2016. We have endeavoured to focus on science, technology and innovation (STI), as various studies have proven the crucial link between scientific discovery and innovation and economic growth. The study of STI policies in relevance to economic growth has been increasingly targeted (Filippetti and Archibugi, 2011, Blanchard *et al.*, 2012).

The study also lists parameters in which India has to work extremely hard, if it desires to be counted as a developed nation. Table I lists general information about Singapore, Taiwan, S. Korea, China and India. Except Singapore, the other three countries became independent nations around the middle of the twentieth century (Taiwan has no official independence date). Singapore tasted independence a little later, in 1965. India and China possess large land mass and are densely populated in comparison to Singapore, Taiwan and S. Korea. All the five nations have different modes of governance and type of economies. Most of these Asian economies have been characterised by rapid growth in recent years, prompting researchers to explore the factors that contributed to this phenomenal growth (Huang and Ho, 2017).

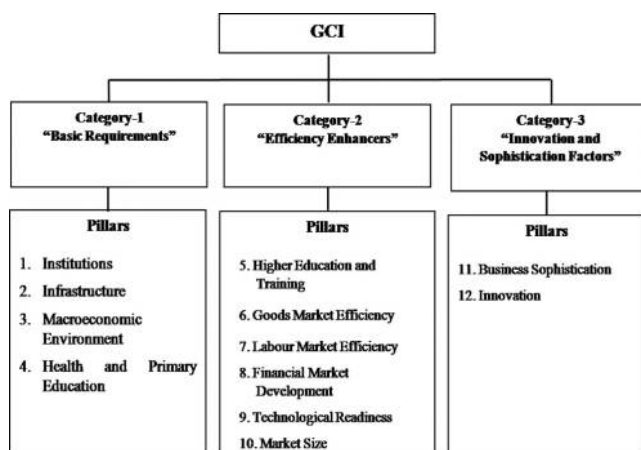
### Structure of the Global Competitiveness Index and comparison of five Asian economies

GCI compares the economic competitiveness of nations (140 nations in 2015-2016 edition) based on the statistical data collected from internationally recognized agencies, such as International Monetary Fund (IMF), World Health Organization (WHO) and USA-India Educational Foundation (USIEF) etc. GCI data are divided into three broad categories ("Basic Requirements", "Efficiency Enhancers" and "Innovations and Sophistication Factors") comprising 12 pillars (P) (Figure 1) which encompass 114 indicators (I) (mentioned later in the text). The classification of world economies based on the stage of development is given in Table II. The stage of development [Stage 1 (factor-driven), Stage 2 (efficiency-driven) and Stage 3 (innovation-driven)] of a country is being proxied by its gross domestic product (GDP) per capita (in US dollar). GCI takes stages of development into account by

Attributes	Singapore	Taiwan	S. Korea	China	India
Independence	9 August 1965	No official day	15 August 1948	1 October 1949	15 August 1947
Population <sup>a</sup> (billions)	0.057	0.02343 <sup>b</sup>	0.504	1.364	1.295
Land area <sup>a</sup> (square kilometres)	707	36,193 <sup>c</sup>	97,466	9,388,211	2,973,190
Government type	Parliamentary Republic	Multi-party Democracy <sup>c</sup> (semi- presidential)	Presidential	Autocratic Socialist	Federal Republic
Economy type	Free market	Capitalist economy	Market economy	Socialist market	Mixed economy

**Notes:** <sup>a</sup>World Bank – 2014 ([www.worldbank.org](http://www.worldbank.org)); <sup>b</sup>Trading economy ([www.tradingeconomics.com/taiwan/indicators](http://www.tradingeconomics.com/taiwan/indicators)); <sup>c</sup>[www.taiwan.gov.tw](http://www.taiwan.gov.tw)

**Table I.**  
General information  
about select Asian  
countries



**Figure 1.**  
Classification of the  
GCI

Classes of world economy	Stage 1	Stage 2	Stage 3
Economy type	Factor-driven	Efficiency-driven	Innovation-driven
GDP per capita (US dollar) thresholds	<2,000	3,000-8,999	>17,000
Weightage of each category of GCI for specific economy (%)			
Basic Requirements	60	40	20
Efficiency Enhancers	35	50	50
Innovation and Sophistication Factors	5	10	30
No. of nations in each stage	35 economies including India	31 economies including China	38 economies including Singapore, Taiwan and S. Korea

**Table II.**  
Classification of  
world economies  
based on the stages  
of development

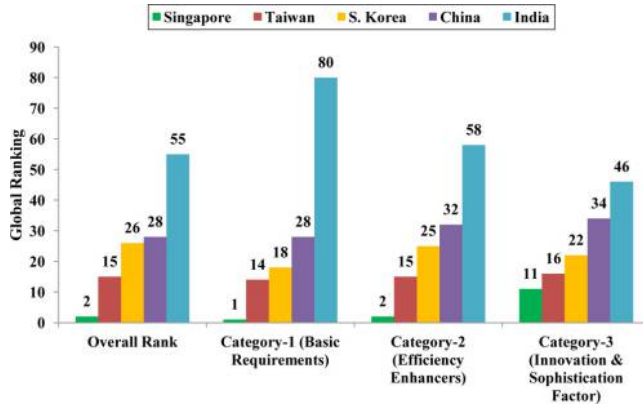
considering higher relative weights to those pillars that are more relevant for an economy given its particular stage of development. Any country which falls between two of the stages is considered to be in the transition stage.

As per GCI ranking of 140 nations, Singapore (2), Taiwan (15) and S. Korea (26) are in the “innovation-driven stage”; China (28) is in the “efficiency-driven stage”; and India (55) is in the “factor-driven stage”. India has to cover a lot of ground to march into the efficiency/innovation-driven stage. It needs to take a serious look at its economic policies and implementation approaches. Similarly, China has to introspect and make changes in policies and governance for advancing to the innovative stage. The comparative graphical depiction of all the five countries based on the aforementioned three categories (“basis requirements”, “Efficiency Enhancers” and “Innovation and Factor”) is given in [Figure 2](#). The area in which more emphasis is needed by these countries is discussed in the following text and tables.

#### *Category-1 (Basic Requirements)*

“Basic requirements” category provides information about the basic foundation of a nation and comprises of four pillars (P), i.e. P-1: “institutions”, P-2: “infrastructure”,

**Figure 2.**  
Global rankings of the nations based on three categories of GCI

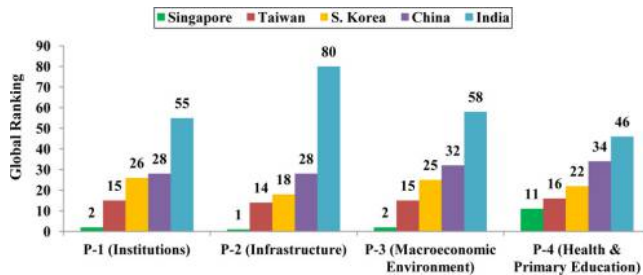


P-3: “macroeconomic environment” and P-4: “health and primary education”. The graphical representation of the global ranking of the five countries based on the pillars (P1-P4) of this category is shown in Figure 3.

*P-1 (Institutions)*. This pillar comprises the administrative and legal structure within which individuals, firms and governments function and interact to generate wealth. The role of institutions extends beyond the legal framework. The attitudes of the government regarding market freedom and the overall functional efficiency are also very important. The institutional quality is a strong determinant of competitiveness and growth (Acemoglu *et al.*, 2012; Sala-i-Martin and Subramanian, 2003). Firms are unwilling to invest in a country or region if their rights are not protected (de Soto, 2000). Various institutional factors have an important role in economic growth and different execution efficiencies of the institutions correlates with the overall economic performance, thus highlighting the importance of governance (Pradhan and Sanyal, 2011). The importance of structural changes in bringing about improvement in productivity and eventually in boosting economic growth has been studied in depth by several renowned researchers in this field (Lin and Monga, 2010; Lin, 2012).

In this pillar, Singapore has a Rank-2 and Taiwan is at Rank-27, whereas, China, S. Korea and India have been placed at Ranks-51, -69 and -60, respectively (Table III). In fact, Singapore has a single-digit ranking (1-9) in 18 indicators. Except India, which is at Rank-6 in indicator I-1.21 (*Strength of Investor Protection*), the others are not even ranked amongst the top ten economies in any of the indicators. Taiwan has secured top 20 positions in the following 6 indicators out of 21 indicators: pertaining to *Property Rights* (I-1.01), *Burden of Government Regulation* (I-1.09), *Transparency of Government Policy Making* (I-1.12),

**Figure 3.**  
Global rankings of the nations based on the pillars of Category-1 (Basic Requirements)



Indicators	Global rankings				
	Singapore (2) <sup>a</sup>	Taiwan (27) <sup>a</sup>	S. Korea (69) <sup>a</sup>	China (51) <sup>a</sup>	India (60) <sup>a</sup>
I-1.01 <i>Property Rights</i>	4	19	45	63	103
I-1.02 <i>Intellectual Property Protection</i>	4	27	52	50	50
I-1.03 <i>Diversion of Public Funds</i>	4	34	66	28	40
I-1.04 <i>Public Trust in Politicians</i>	1	32	94	67	31
I-1.05 <i>Irregular Payments &amp; Bribes</i>	3	29	46	67	63
I-1.06 <i>Judicial Independence</i>	23	47	69	29	64
I-1.07 <i>Favouritism in Decision of Government Officials</i>	2	24	80	24	32
I-1.08 <i>Wastefulness of Government Spending</i>	3	45	70	26	51
I-1.09 <i>Burden of Government Regulation</i>	1	20	97	50	27
I-1.10 <i>Efficiency of Legal Framework in Settling Disputes</i>	1	56	57	66	42
I-1.11 <i>Efficiency of Legal Framework in Challenging Reg.</i>	10	63	74	36	39
I-1.12 <i>Transparency of Government Policy Making</i>	1	15	123	86	58
I-1.13 <i>Business Costs of Terrorism</i>	41	33	93	60	126
I-1.14 <i>Business Costs of Crime &amp; Violence</i>	7	16	68	76	98
I-1.15 <i>Organized Crime</i>	5	32	83	51	119
I-1.16 <i>Reliability of Police Services</i>	8	37	47	60	86
I-1.17 <i>Ethical Behaviour of Firms</i>	4	31	95	61	44
I-1.18 <i>Strength of Auditing &amp; Reporting Standards</i>	7	19	72	80	95
I-1.19 <i>Efficacy of Corporate Boards</i>	6	35	120	105	96
I-1.20 <i>Protection of Minority Shareholders Interests</i>	6	16	95	71	69
I-1.21 <i>Strength of Investor Protection</i>	3	30	21	110	6

**Table III.**  
Global rankings of  
the nations based on  
the indicators of P-1  
(Institutions)

**Note:** <sup>a</sup>Overall global rank

*Business Costs of Crime & Violence* (I-1.14), *Strength of Auditing and Reporting Standards* (I-1.18) and *Protection of Minority Shareholders Interests* (I-1.20). China has global ranking positions in twenties in four indicators pertaining to *Favouritism in Decision of Government Official* (I-1.07), *Wasteful Expenditure* (I-1.08), *Diversion of Public Funds* (I-1.03) and *Judicial Independence* (I-1.07) and Taiwan in three indicators which are *Intellectual Property Protection* (I-1.02), *Irregular Payments and Bribes* (I-1.05) and *Favouritism in Decision of Government Official* (I-1.07). In comparison, S. Korea and India have been ranked in twenties in only one parameter. India is ranked at 27 in *Burden of Government Regulation* (I-1.09) and S. Korea is ranked 21 in *Strength of Investor Protection* (I-1.21). In five indicators (I-1.01, I-1.02, I-1.05, I-1.10 and I-1.12-20), China, India and S. Korea do not feature in the top 40 nations, thereby suggesting a need for vast improvement in these parameters. In addition, China has to address the issues of *Public Trust in Politicians* (I-1.04), *Burden of Government Regulation* (I-1.09) and *Strength of Investor Protection* (I-1.21), as its global rankings in these indicators are 67, 50 and 110, respectively. Similarly, poor global rankings of S. Korea, ranging from 69 to 97 in five indicators, i.e. *Public Trust in Politicians* (I-1.04), *Judicial Independence* (I-1.06), *Favouritism in Decision of Government Officials* (I-1.07), *Wastefulness of Government Spending* (I-1.08) and *Burden of Government Regulation* (I-1.09), require serious thinking and impetus for improvement by the government. India has to lay more emphasis on *Wastefulness of Government Spending* (I-1.08), as it has been ranked 51. Singapore has only one parameter (I-1.13) related to *Business Cost of Terrorism* to improve upon, where it is ranked 41.

*P-2 (Infrastructure)*. Under this pillar, the quality and extensiveness of “infrastructure” in a country is assessed. Among the important infrastructures, a wide network of effective



modes of transportation, uninterrupted electricity supply and a robust and extensive telecommunications network are considered essential for economic growth. Infrastructures, which can be either physical or digital, has an indirect impact on the productivity by enabling and improving access to basic services such as sanitation, education and health care, thus contributing towards a workforce which is healthier and better skilled (Calderón and Servén, 2014).

The global rankings of the five nations in this pillar (Table IV) indicate that Singapore (2), Taiwan (12) and S. Korea (13) are performing very well, whereas China (39) and India (81) have immense scope for improvement. Singapore has excellent infrastructure in terms of roads, railways, airports and seaports, as it is ranked amongst the top eight global economies. In fact, it is the top ranked in the *Quality of Air Transport Infrastructure* (I-2.05), and it is second to The Netherlands in *Quality of Port Infrastructure* (I-2.04). Based on the indicators I-2.08 and I-2.09, it seems that Singaporeans rely more on mobile telephones than on fixed telephones. S. Korea's and Taiwan's performance is praiseworthy in this (I-2.09) pillar. The overall rank of Taiwan and S. Korea in this pillar is almost the same, and Taiwan has secured top 10 positions in two indicators, i.e. *Quality of Roads* (I-2.02) and *Fixed-Telephone Lines/100 populations* (I-2.09). In fact, in the indicator *Fixed-Telephone Lines/100 populations*, Taiwan is ranked 2 following Hong Kong SAR (Rank-1) and is performing far better than Singapore (Rank-29). S. Korea has been globally ranked in the range of 10-38 barring for *Mobile Telephone Subscription* (I-2.08), as it relies more on *Fixed Telephones* (I-2.09) and is competing with Taiwan in this indicator, which is at Rank-4 in this indicator (I-2.09). Although China's position is better than India's position in all the nine indicators, both lag behind Singapore, Taiwan and S. Korea in almost all indicators. China and India have satisfactory *Railroad Infrastructure* (I-2.03) but need big improvements in *Quality of Roads* (I-2.02), *Quality of Air Transport Infrastructure* (I-2.05), *Quality of Port Infrastructure* (I-2.04), *Quality of Electric Supply* (I-2.07) and *Telephone Connectivity* (I-2.08 and I-2.09).

*P-3 (Macroeconomic Environment)*. "Macroeconomic environment" is determined by the aggregated indicators such as GDP, unemployment rates, price indexes, etc. This pillar evaluates the stability of the "macroeconomic environment", which is of paramount importance for the smooth functioning of the nations. A nation cannot work properly under uncontrolled inflation conditions. The overall ranks of Singapore, Taiwan, S. Korea, China and India are 12, 13, 5, 8 and 91, respectively (Table V). These rankings clearly suggest that barring India, all the four nations are doing quite well in this pillar.

Indicators		Global rankings				
No.	Names	Singapore (2) <sup>a</sup>	Taiwan (12) <sup>a</sup>	S. Korea (13) <sup>a</sup>	China (39) <sup>a</sup>	India (81) <sup>a</sup>
I-2.01	<i>Quality of Overall Infrastructure</i>	4	21	20	51	74
I-2.02	<i>Quality of Roads</i>	3	10	17	42	61
I-2.03	<i>Quality of Railroad Infrastructure</i>	8	11	10	16	29
I-2.04	<i>Quality of Port Infrastructure</i>	2	19	27	50	60
I-2.05	<i>Quality of Air Transport Infrastructure</i>	1	26	28	51	71
I-2.06	<i>Available Airline Seat km/week, millions</i>	20	26	19	2	11
I-2.07	<i>Quality of Electricity Supply</i>	3	28	38	53	98
I-2.08	<i>Mobile Telephone Subscriptions/100 populations</i>	14	44	65	107	121
I-2.09	<i>Fixed Telephone Lines/100 populations</i>	29	2	4	63	116

**Note:** <sup>a</sup>Overall global rank

**Table IV.** Global rankings of the nations based on the indicators of P-2 (Infrastructure)

India fares very poorly in all but one indicator *Gross National Savings* (I-3.02), as its global ranking is in triple digits in three out of total five indicators. These indicators are I-3.01: *Government Budget Balance*; I-3.03: *Inflation, Annual % Change*; and I-3.04: *General Government Debt*. In one indicator I-3.03 (*Inflation, Annual % Change*), four nations, i.e. Singapore, Taiwan, S. Korea and China, are at positioned at 1, whereas, India is at position 105 which is undoubtedly miserable. S. Korea, China and Taiwan can look upon Singapore for improvements in the indicator related to *Government Budget Balance* (I-3.01). Singapore's ranking in four indicators (I-3.01, I-3.02, I-3.03 and I-3.05) is remarkable; however, it needs improvement in *General Government Debt, % GDP* (I-3.04). Taiwan and S. Korea are performing almost equally well in the last four indicators.

*P-4 (Health & Primary Education)*. Apart from health, this pillar also takes into consideration the scale and quality of basic education received by the population. Basic education is increasingly important in today's scenario, as it enhances the efficiency of each individual worker and also has an impact on the overall national productivity (Cole and Neumayer, 2006). Lack of basic education constrains business development and further expansion. The positive correlation between education and economic growth has been well-documented (Khan and Khattak, 2012; Todaro and Smith, 2015). Singapore is at Rank-2 after Finland (Rank-1) in this pillar (Table VI). Taiwan, S. Korea, China and India have been ranked at Ranks-14, -23, -44 and -84, respectively.

Indicators		Global rankings				
No.	Names	Singapore (12) <sup>a</sup>	Taiwan (13) <sup>a</sup>	S. Korea (5) <sup>a</sup>	China (8) <sup>a</sup>	India (91) <sup>a</sup>
I-3.01	<i>Government Budget Balance, % GDP</i>	6	60	19	34	131
I-3.02	<i>Gross National Savings, % GDP</i>	5	12	14	3	23
I-3.03	<i>Inflation, Annual % Change</i>	1	1	1	1	105
I-3.04	<i>General Government Debt, % GDP</i>	127	56	52	66	103
I-3.05	<i>Country Credit Rating, 0-100</i>	7	21	20	26	50

**Note:** <sup>a</sup>Overall global rank

**Table V.**  
Global rankings of the nations based on the indicators of P-3 (Macroeconomic Environment)

Indicators		Global rankings				
No.	Names	Singapore (2) <sup>a</sup>	Taiwan (14) <sup>a</sup>	S. Korea (23) <sup>a</sup>	China (44) <sup>a</sup>	India (84) <sup>a</sup>
I-4.01	<i>Malaria Cases/1000,000 populations</i>	MF*	MF*	18	15	44
I-4.02	<i>Business Impact of Malaria</i>	NA <sup>#</sup>	NA <sup>#</sup>	22	32	60
I-4.03	<i>Tuberculosis Cases/1000,000 populations</i>	66	69	89	81	113
I-4.04	<i>Business Impact of Tuberculosis</i>	48	46	85	93	132
I-4.05	<i>HIV Prevalence, % Adult populations</i>	1	1	1	1	63
I-4.06	<i>Business Impact of HIV/AIDS</i>	39	25	79	86	130
I-4.07	<i>Infant Mortality, Deaths/1,000 Live Births</i>	6	25	16	59	114
I-4.08	<i>Life Expectancy in Years</i>	6	30	13	53	107
I-4.09	<i>Quality of Primary Education</i>	3	16	36	55	52
I-4.10	<i>Primary Education Enrolment, net %</i>	1	32	31	20	77

**Notes:** <sup>a</sup>Overall global rank; \*M.F – Malaria-free; <sup>#</sup>NA – not applicable

**Table VI.**  
Global rankings of the nations based on the indicators of P-4 (Health & Primary Education)



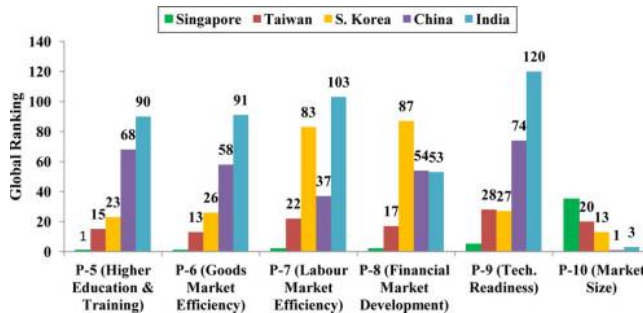
The extent of prevalence of two major diseases, malaria and tuberculosis, as well as infant mortality, is indicative of the level of hygienic conditions prevailing in a country. Poor hygienic conditions have an impact on the performance of public and private sectors. Amongst the five nations, India has the maximum *Prevalence of Malaria (I-4.01)*, *Tuberculosis (I-4.03)*, *HIV (I-4.05)* and *Infant Mortality Deaths (I-4.07)*, and is thus ranked very poorly in global rankings (Table VI). As shown in Table VI, Singapore and Taiwan are performing extraordinarily well in the first two indicators, i.e. *Malaria Cases/1000000 Populations (I-4.01)* and *Business Impact of Malaria (I-4.02)*, because both countries have been declared Malaria-free. China has a better record than India but poor record *vis a vis* Singapore, Taiwan and S. Korea. Even though, the causative agent of malaria, anopheles mosquito, thrives in tropical region, malaria cases are not seen in Singapore owing to the maintenance of hygiene throughout the nation.

Amongst the parameters of primary education (I-4.09), Singapore is listed amongst the top three nations. Finland and Belgium occupy Ranks-1 and -2, respectively. India does not figure in the top 50 nations. Although Taiwan (16) and S. Korea (36) have a better ranking than China (55) and India (52) in the indicator of *Quality of Primary Education (I-4.09)*, China (20) has a better record than S. Korea (31) in the indicator, *Percentage of Primary Education Enrolment (I-4.10)*, in which India is placed at Rank-77.

*Category-2 (Efficiency Enhancers)*

The factors that are responsible for enhancing the efficiency of human resource and economic operations are grouped under this category. Six pillars comprising this category are “higher education and training”, “goods market efficiency”, “labour market efficiency”, “financial market development”, “technological readiness” and “market size”. Based on the overall ranking of this category, Singapore, Taiwan, S. Korea, China and India have Ranks-2, -15, -25, -32 and -58, respectively (Figure 2). The first place is occupied by the USA. The overall ranking of the five nations under this category (P5-P10) is given in Figure 4.

*P-5 (Higher Education and Training)*. This pillar focuses on secondary and tertiary enrolment rates, as well as the quality of education, as evaluated by business leaders. The extent of staff training is also considered because of the importance of vocational and continuous training for constant upgradation of workers’ skills. Today’s rapidly globalizing economy necessitates countries to nurture pools of highly educated workers who are able to perform complicated tasks and rapidly adapt to their changing environment and the evolving needs of the economy (Acemoglu, 2009). The significance of skilled manpower in the development of economies has been reported in detail through the work of various researches (Todaro and Smith, 2015). Recent studies conducted by Dahal (2016) empirically



**Figure 4.** Global rankings of the nations based on the pillars of Category-2 (Efficiency Enhancers)

proved the triangular casualty of education, health and economic growth. Every indicator of this pillar is very important for economies to move up the value chain.

This pillar comprises eight indicators (Table VII), and Singapore is Rank-1 overall. Except for *Secondary Education Enrolment* (I-5.01), Singapore is doing exceedingly well in other seven indicators, as its global ranking is in single digits. The education system of Singapore is very strong and coordination with education ministries is also very good. This effective coordination has resulted in the ranking of two of its universities, i.e. National University of Singapore (26) and Nanyang Technological University (55), in the top 100 universities worldwide (*The Times Higher Education World University Rankings, 2015*). S. Korea has an excellent record in the indicator I-5.02 (*Tertiary Education Enrolment, gross%*), where it has Rank-2. Only Greece is ahead of S. Korea in this indicator. In this indicator (*Tertiary Education Enrolment, gross%*), Taiwan (8) and Singapore (9) have secured top ten positions, which is commendable. They also have a satisfactory score related to the availability of access to internet services (I-5.06) in schools. China and India are lagging behind many nations in this pillar, as their global rankings range between Ranks-47 to -85 and Ranks- 43 to -105, respectively, in the indicators falling under this pillar.

*P-6 (Goods Market Efficiency)*. Economies with efficient goods markets are well placed to provide the right mix of products and services according to their supply-demand environment (Aghion and Schankerman, 2004). Market competition (both domestic and foreign), customer orientation and buyer sophistication are taken into consideration in assessing goods market efficiency. The best environment for the exchange of goods requires minimal governmental intervention that impedes business activity. There are 16 indicators under this pillar (Table VIII).

Under this pillar, global Rank-1 is again occupied by Singapore. Out of a total of 16 indicators, it enjoys between Rank-1 and Rank-10 in 14 parameters. In the remaining two parameters of *Intensity of Local Competition* (I-6.01) and *Extent of Market Dominance* (I-6.02), it has Ranks-21 and -13, respectively. Taiwan has secured single-digit positions in four indicators, i.e. *Intensity of Local Competition* (I-6.01), *Extent of Market Dominance* (I-6.02), *Number of Procedures to Start a Business* (I-6.06) and *Degree of Customer Orientation* (I-6.15). It is doing much better than Singapore in these aforementioned indicators. S. Korea has Rank-26 and matches Singapore and Taiwan in *Number of Procedures to Start a Business* i.e. 9, (I-6.06). Even in *Number of Days to Start a Business* (I-6.07) and *Buyers Sophistication* (I-6.16), S. Korea is not far behind Singapore. In one indicator, i.e. I-6.01, dealing with the extent of market competition of goods/services, Taiwan

**Table VII.**  
Global rankings of  
the nations based on  
the indicators of P-5  
(Higher Education &  
Training)

Indicators		Global rankings				
		Singapore	Taiwan	S. Korea	China	India
No.	Names	(1) <sup>a</sup>	(15) <sup>a</sup>	(23) <sup>a</sup>	(68) <sup>a</sup>	(90) <sup>a</sup>
I-5.01	<i>Secondary Education Enrolment, gross %</i>	17	31	48	74	105
I-5.02	<i>Tertiary Education Enrolment, gross %</i>	9	8	2	83	86
I-5.03	<i>Quality of Education System</i>	3	46	66	56	43
I-5.04	<i>Quality of Math &amp; Science Education</i>	1	15	30	49	63
I-5.05	<i>Quality of Management Schools</i>	4	33	59	85	55
I-5.06	<i>Internet Access in Schools</i>	2	27	19	47	100
I-5.07	<i>Availability of Specialized Training Services</i>	8	23	48	63	68
I-5.08	<i>Extent of Staff Training</i>	4	27	36	50	48

Note: <sup>a</sup>Overall global rank

Indicators		Global rankings				
No.	Names	Singapore (1) <sup>a</sup>	Taiwan (13) <sup>a</sup>	S. Korea (26) <sup>a</sup>	China (58) <sup>a</sup>	India (91) <sup>a</sup>
I-6.01	<i>Intensity of Local Competition</i>	21	5	13	36	101
I-6.02	<i>Extent of Market Dominance</i>	13	4	97	28	41
I-6.03	<i>Effectiveness of Anti-Monopoly Policy</i>	5	23	33	36	41
I-6.04	<i>Effect of Taxation on Incentives to Invest</i>	5	26	78	50	38
I-6.05	<i>Total Tax Rate, % profits</i>	10	58	48	128	123
I-6.06	<i>No. Procedure to Start a Business</i>	9	9	9	123	129
I-6.07	<i>No. Days to Start a Business</i>	4	53	10	117	110
I-6.08	<i>Agricultural Policy Costs</i>	6	44	69	16	53
I-6.09	<i>Prevalence of Non-Tariff Barriers</i>	1	17	97	78	82
I-6.10	<i>Trade Tariffs, % duty</i>	2	68	85	117	124
I-6.11	<i>Prevalence of Foreign Ownership</i>	4	49	92	74	96
I-6.12	<i>Business Impact of Rules on FDI</i>	3	50	98	61	92
I-6.13	<i>Burden of Customs Procedures</i>	2	12	43	56	54
I-6.14	<i>Imports as a % age of GDP</i>	2	42	74	131	116
I-6.15	<i>Degree of Customer Orientation</i>	9	5	25	68	97
I-6.16	<i>Buyers Sophistication</i>	7	19	8	21	26

**Table VIII.**  
Global rankings of the nations based on the indicators of P-6 (Goods Market Efficiency)

**Note:** <sup>a</sup>Overall global rank

is ahead of S. Korea, Singapore, China and India. China and India have a lot of catching up to do in this pillar, as they are not even in the top 100 nations in the five indicators of *Taxation Rate* (I-6.05), *Number of Procedures to Start a Business* (I-6.06), *Number of Days to Start a Business* (I-6.07), *Percentage Duty on Trade Tariffs* (I-6.10) and *Imports as % of GDP* (I-6.14). The best ranking of these two countries is in twenties in the indicator *Buyers Sophistication* (I-6.16). In majority of the indicators belonging to the pillar “Goods Market Efficiency”, and both these countries do not figure in the top 50 nations considered for the comparative data analysis for this study.

*P-7 (Labour Market Efficiency)*. “Labour Market Efficiency” and flexibility are critical for ensuring that workers are employed in their most effective sector in the economy and incentivized to put in their best effort (Bassanini *et al.*, 2009). Efforts to promote meritocracy, gender equality and strong incentives for employees promote efficient labour markets. These factors have a positive effect on the overall performance of workers and the attractiveness of the country for global talent. Rigid labour markets are generally characterized by high unemployment rates. This pillar comprises ten indicators (Table IX).

Once again, Singapore is doing very well in this pillar, as only Switzerland is ahead of Singapore in the overall global rank. In nine out of total ten indicators, Singapore’s global ranking ranges between 2 and 6. Only the indicator I-7.10, dealing with the extent of women doing labour work, its global ranking (75) is quite poor. In fact, the other four nations are also not doing well in this indicator, as they have been ranked at 60 (China), 79 (Taiwan), 91 (S. Korea) and 132 (India). Taiwan has Rank-22 in this pillar, and it figures in the top 20 nations in four indicators out of ten: *Cooperation in Labour-Employer Relations* (I-7.01), *Flexibility Wage Determination* (I-7.02), *Hiring & Firing Practices* (I-7.03) and *Pay & Productivity* (I-7.06). China has an overall ranking of 37, with the best ranking of 17 in the indicator *Hiring and Firing Practices* (I-7.03). In other three indicators involving *Pay and Productivity* (I-7.06), *Capacity to Retain Talent* (I-7.08) and *Capacity to Attract Talent* (I-7.09), China’s performance is not bad as its global rankings of these indicators that range from

Indicators		Global rankings				
No.	Names	Singapore (2) <sup>a</sup>	Taiwan (22) <sup>a</sup>	S. Korea (83) <sup>a</sup>	China (37) <sup>a</sup>	India (103) <sup>a</sup>
I-7.01	<i>Cooperation in Labour–Employer Relations</i>	3	19	132	62	86
I-7.02	<i>Flexibility Wage Determination</i>	6	14	66	73	120
I-7.03	<i>Hiring &amp; Firing practices</i>	4	14	115	17	25
I-7.04	<i>Redundancy Costs, Weeks of Salary</i>	5	102	117	117	70
I-7.05	<i>Effect of Taxation on Incentives to Work</i>	3	21	99	58	36
I-7.06	<i>Pay &amp; Productivity</i>	3	9	24	20	47
I-7.07	<i>Reliance on Professional Management</i>	5	26	37	55	86
I-7.08	<i>Country Capacity to Retain Talent</i>	6	39	25	30	40
I-7.09	<i>Country Capacity to Attract Talent</i>	2	56	35	27	40
I-7.10	<i>Women in Labour Force, ratio to men</i>	75	79	91	60	132

**Table IX.**  
Global rankings of  
the nations based on  
the indicators of P-7  
(Labour Market  
Efficiency)

Note: <sup>a</sup>Overall global rank

20 to 30. However, it has to address other indicators, especially I-7.04, which deals with the cost of the salary paid to a redundant employee. Its global ranking in this indicator is 117. Although S. Korea's overall ranking in this pillar is 83, its performance is satisfactory (global rankings 24-37), in four indicators (I-7.06, I-7.07, I-7.08 and I-7.09) dealing with the ability to attract and retain talent, level of professional management and the relationship of employees' salary *vis-à-vis* productivity of the company. India does not figure in the top 100 nations in this pillar. Only in one indicator (I-7.03: *Hiring and Firing Practices*), its global rank is 25, which is satisfactory. Its poorest performance is in the parameter dealing with the *Ratio of Men to Women in Labour Force* (I-7.10), where it has been ranked at number 132. If we consider the ranking range of all five nations, Singapore and Taiwan range in the same scale, 2-75 and 2-79, respectively, and S. Korea and India range in the same scale, 24-132 and 25-132, respectively.

*P-8 (Financial Market Development)*. A sound and well-functioning financial sector allocates the natural resources or resources generated by a nation's citizens, as well as those entering the economy from abroad, to their most productive uses for economic activities (Levine, 2005). Financial market development is determined by capital availability from sources such as loans, securities exchanges, venture capital and other financial products for which the banking sector needs to be trustworthy and transparent. The global ranking range for India under this pillar is 13-100 (Table X), whereas for Singapore, Taiwan, S. Korea and China, the range is 3-17, 3-80, 47-119 and 16-80, respectively. In the indicator *Venture Capital Availability* (I-8.05), India is doing better than S. Korea (86) and China (16), with a global rank of 13, and is competing with Taiwan (12). Singapore enjoys Rank-3 in this indicator. Taiwan has procured top 20 positions in four indicators out of 8, i.e. *Affordability of Financial Services* (I-8.02), *Financing through Local Equity Market* (I-8.03), *Venture Capital Availability* (I-8.05) and *Regulations of Securities Exchanges* (I-8.07).

*P-9 (Technological Readiness)*. The application of technology is increasingly essential for firms to compete and prosper in the globalized economy. The pillar of "technological readiness" measures the efficiency with which existing technologies are adopted by an economy to enhance industrial productivity, with particular emphasis on its capacity to fully leverage information and communication technologies (Comin and Hobijn, 2004). This pillar comprises of seven indicators (Table XI) which are reflective of the levels of science and technology of the nations.

The global rankings of Singapore (5), Taiwan (28), S. Korea (27), China (74) and India (120) clearly indicate that Singapore is far ahead of the other four countries. Singapore is technology- and internet-savvy, and Taiwan is a leading competitor in the world's information and communication technology sector. According to the World Trade Organization, Taiwan was the 20th largest exporter and the 19th largest importer of merchandise in 2014 ([The Official Website of the Republic of China, 2016](#)). Singapore not only encourages FDI (I-9.04) but also promotes the use of wireless connectivity (I-9.06 & 9.07). S. Korea figures in the top 20 global rankings in three indicators (I-9.04, I-9.05 and I-9.07), and it can improve in two indicators, namely, *FDI & Technology Transfer* (I-9.03) and *International Internet Bandwidth* (I-9.06). In the indicator, *Individuals Using Internet* (I-9.04), Singapore (24), Taiwan (22) and S. Korea (20) are competing with each other. China and India are yet to embrace technology and use of internet services on a large scale. Under this pillar, the global rankings of China and India are 57-119 and 95-124, respectively. In fact, India's ranking is more than 100 in all the indicators except *FDI and Technology Transfer* (I-9.03), i.e. 95. The dismal scenario of India and China in this pillar calls for radical changes in the policy related to FDI, latest-technology usage and internet services.

*P-10 (Market Size)*. Traditionally, the markets available to firms have been constrained by national borders, and the size of the market affects productivity because large markets allow firms to exploit economies of scale ([Romer, 1996](#)). However, in this era of globalization,

**Table X.**  
Global rankings of the nations based on the indicators of P-8 (Financial Market Development)

Indicators		Global rankings				
No.	Names	Singapore (2) <sup>a</sup>	Taiwan (17) <sup>a</sup>	S. Korea (87) <sup>a</sup>	China (54) <sup>a</sup>	India (53) <sup>a</sup>
I-8.01	<i>Availability of Financial Services</i>	8	24	99	61	81
I-8.02	<i>Affordability of Financial Services</i>	7	11	89	48	71
I-8.03	<i>Financing through Local Equity Market</i>	8	3	47	44	45
I-8.04	<i>Ease of Access to Loans</i>	4	26	119	21	29
I-8.05	<i>Venture Capital Availability</i>	3	12	86	16	13
I-8.06	<i>Soundness of Banks</i>	5	25	113	78	100
I-8.07	<i>Regulation of Securities Exchanges</i>	3	14	78	52	69
I-8.08	<i>Legal Rights Index, 0-12</i>	17	80	63	80	44

**Note:** <sup>a</sup>Overall global rank

**Table XI.**  
Global rankings of the nations based on the indicators of P-9 (Technological Readiness)

Indicators		Global rankings				
No.	Names	Singapore (5) <sup>a</sup>	Taiwan (28) <sup>a</sup>	S. Korea (27) <sup>a</sup>	China (74) <sup>a</sup>	India (120) <sup>a</sup>
I-9.01	<i>Availability of Latest Technologies</i>	13	36	31	95	108
I-9.02	<i>Firm-Level Technology Absorption</i>	16	25	27	66	102
I-9.03	<i>FDI &amp; Technology Transfer</i>	2	37	67	69	95
I-9.04	<i>Individuals Using Internet</i>	24	22	20	70	107
I-9.05	<i>Fixed Broadband Internet Subscriptions/100 populations</i>	23	16	5	57	104
I-9.06	<i>Int'l Internet Bandwidth, kb/s per User</i>	4	45	57	119	116
I-9.07	<i>Mobile-Broadband Subscriptions/100 populations</i>	1	34	12	71	124

**Note:** <sup>a</sup>Overall global rank



international markets have emerged as a substitute for domestic markets, especially for small countries. Thus, market size is inclusive of both domestic and foreign markets. There are four indicators under this pillar (Table XII).

This is the only pillar in which India and China have been ranked amongst the top five nations. China tops the overall rankings, followed by USA and India. Top rankings of these nations in the first two indicators, namely, *Domestic Market Size Index* (I-10.01) and *Foreign Market Size Index* (I-10.02), could be attributed to large size and large population of both these countries. However, India and China are performing poorly in the export sector as reflected by their rankings of 110 and 114, respectively, in the indicator I-10.04 (*Exports as a % of GDP*) in which Singapore Rank-3 and Taiwan is Rank-23. S. Korea's global ranking of 8-13 in the first three indicators (I-10.01 to I-10.03) is suggestive of good performance in the domains of domestic market size, foreign market size and purchasing power parity (PPP). However, it can improve upon the indicator I-10.04 dealing with the exports of goods and services to the rest of the world. Singapore not only encourages foreign investment but also exports many of the products manufactured (I-10.04: *Exports as a % of GDP*) and thus globally placed at Rank-3. Because of small size and population, Singapore finds it difficult to increase the *Domestic Market Size Index* (I-10.01). The ranking range of Taiwan is 13-23 which is very consistent. Taiwan is leading Singapore in two indicators (Table XII) out of 4, i.e. *Domestic Market Size Index* (I-10.02), which may be again attributed to population and size of both the countries and *GDP (PPP\$ billions)* (I-10.03). Although, the population size of India and China is large, the manpower is semi-skilled and poor in education. By working on these parameters, both nations can certainly improve upon exporting many goods and thus generating revenues for the respective countries.

### Category-3 (Innovation & Sophistication)

This category comprises two pillars, i.e. "Business Sophistication" & "Innovation". The ranking in these pillars determines the level of sophistication in terms of business operations and application of technological innovation. The overall ranking of five nations under this category (P11 and P12) is given in Figure 5. In both the pillars, Singapore tops the global ranking amongst five nations, followed by Taiwan, S. Korea, China and India.

*P-11 (Business Sophistication)*. It is a common knowledge that sophisticated business practices lead to higher efficiency in the production of goods and services. The qualities of a country's overall business network and of individual firms' operations and strategies are two closely interlinked factors that determine business sophistication (WEF Report, 2015). The assessment of the sophistication factors such as branding, marketing, distribution, advanced production processes and production of unique and sophisticated products are grouped under this pillar. There are nine indicators under this pillar (Table XIII).

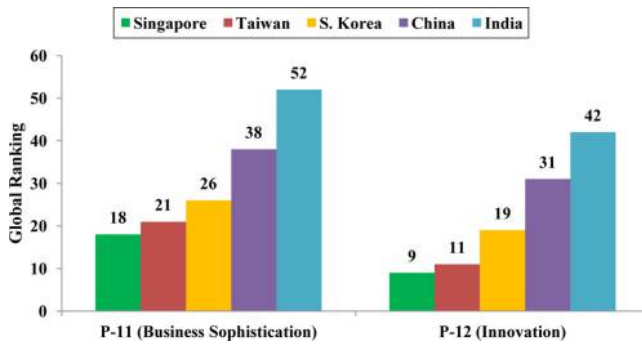
Indicators	Names	Global rankings				
		Singapore (35) <sup>a</sup>	Taiwan (20) <sup>a</sup>	S. Korea (13) <sup>a</sup>	China (1) <sup>a</sup>	India (3) <sup>a</sup>
I-10.01	<i>Domestic Market Size Index</i>	43	24	13	2	3
I-10.02	<i>Foreign Market Size Index</i>	9	13	8	1	3
I-10.03	<i>GDP (PPP\$ billions)</i>	39	20	13	1	3
I-10.04	<i>Exports as a % age of GDP</i>	3	23	47	110	114

Note: <sup>a</sup>Overall global rank

**Table XII.**  
Global rankings of  
the nations based on  
indicators of the P-10  
(Market Size)



Amongst the five nations, Singapore is globally ranked at 18, followed by Taiwan (21), S. Korea (26), China (38) and India (52). Except for one indicator, *Local Supplier Quality* (I-11.01), Singapore is ranked between 12-26 in rest of the eight indicators. In five indicators (I-11.03, I-11.04, I-11.05, I-11.07 and I-11.08), it is ranked among the top 18 nations. The overall rank of Taiwan is three ranks less than Singapore in this pillar, but Taiwan is ahead of Singapore in three indicators pertaining to *Local Supplier Quality* (I-11.01), *Local Supplier Quality* (I-11.02) and *State of Cluster Development* (I-11.03). In the first indicator of this pillar (I-11.01) China (15) and Taiwan (13) are competing with each other, as there is only 2 ranks' difference between them. S. Korea's performance is satisfactory as its rankings ranges between 15-33, for eight indicators. Only in one indicator, i.e. *Willingness to Delegate Authority* (I-11.09), it has Rank-62. China has only three indicators, I-11.01 (*Local Supplier Quality*), I-11.03 (*State of Cluster Development*) and I-11.06 (*Control of International Distribution*), in which it is ranked among the top 30 nations, whereas in other six indicators, it is placed in the global rankings between 43 and 64. India's overall ranking of 52 indicates that it has a lot to catching up to do with Singapore, Taiwan, S. Korea and China. Its best ranking (29) is in the indicator, *Value Chain Breadth* (I-11.05) and worst (82) in *Extent of Marketing* (I-11.08), which suggests that India has to quickly learn the nuances of marketing and administration if it dreams of becoming a significant player in the global economy.



**Figure 5.** Global rankings of the nations based on the pillars of Category-3 (Innovation & Sophistication Factors)

Indicators		Global rankings				
No.	Names	Singapore (18) <sup>a</sup>	Taiwan (21) <sup>a</sup>	S. Korea (26) <sup>a</sup>	China (38) <sup>a</sup>	India (52) <sup>a</sup>
I-11.01	<i>Local Supplier Quality</i>	71	13	23	15	54
I-11.02	<i>Local Supplier Quality</i>	26	20	28	63	66
I-11.03	<i>State of Cluster Development</i>	13	5	23	24	29
I-11.04	<i>Nature of Competitive Advantage</i>	15	22	20	48	47
I-11.05	<i>Value Chain Breadth</i>	12	19	21	43	29
I-11.06	<i>Control of International Distribution</i>	24	38	15	29	48
I-11.07	<i>Production Process Sophistication</i>	14	21	23	49	61
I-11.08	<i>Extent of Marketing</i>	18	22	33	64	82
I-11.09	<i>Willingness to Delegate Authority</i>	21	31	62	48	56

**Table XIII.** Global rankings of the nations based on the indicators of P-11 (Business Sophistication)

**Note:** <sup>a</sup>Overall global rank

*P-12 (Innovation)*. This pillar of competitiveness focuses on technological innovation. Technological breakthroughs or innovations have been at the very foundation of many dramatic productivity gains that our economies have historically experienced because, in the long run, standards of living can be largely enhanced by technological innovations alone. The acceptability of new, unconventional and disruptive ideas has a great impact on creative innovations that break new frontiers in knowledge creation (Acemoglu *et al.*, 2014).

This pillar comprises of seven indicators (Table XIV). The pattern of comparative rankings of the five nations is the same as observed in the pillar – “Business Sophistication”. Singapore (9) tops the list, followed by Taiwan (11), S. Korea (19), China (31) and India (42). Interestingly, in this pillar, except Taiwan, all other nations are performing better than the pillar “Business Sophistication”, as indicated by better ranking of each nation in the “Innovation” pillar. Singapore has an impressive showing in all the indicators, as its global rankings are in the top 20 nations of the world. Its single-digit ranking of 5 in the indicator *University–Industry Collaboration in R&D* (I-12.04) shows that it lays high emphasis on converting academic knowledge into patents and commercial products. The involvement of private sector investment in R&D is also praiseworthy, as it has been globally ranked 11 in the indicator *Company Spending on R&D* (I-12.03). These impressive rankings are the outcome of highly skilled scientists and availability of sophisticated instruments and other infrastructure (I-12.02 and I-12.06). Taiwan’s over all rank is 11 in this pillar. The investment of private sector in R&D scenario is good, as it is ranked at 13 in the indicator in *Company Spending on R&D* (I-12.0-3). Taiwan figures in top 30 nations in all six indicators under this pillar [the data on patents (I-12.07) are not available for Taiwan in GCI because it is not a signatory of the Patent Corporation of Treaty (PCT)]. S. Korea’s ranking of 19 is satisfactory in this pillar. Except one indicator (I-12.06: *Availability of Scientists and Engineers*), it is doing reasonably well in other six indicators (Table XIII). Its patent-filing ratio is one of the best in the world (I-12.07: *PCT Patents, Application/million populations*). However, it can vastly improve its ranking if it emphasises more on the scientific infrastructure and on producing more professional scientists and engineers. China is not far behind S. Korea in almost all the indicators of the pillar “Innovation”. In fact, it is leading S. Korea in two indicators, namely, *Government Procurement of Advanced Technology Products* (I-12.05) and *Availability of Scientists and Engineers* (I-12.06). India lags behind in all the seven indicators. However, its performance is not as bad in this pillar as is in others. It has been ranked in the range of 26-61, in the pillar of “Innovation”. India is bound to improve its ranking in this category because of heavy investments in R&D and new initiatives of the government to boost entrepreneurship,

Indicators		Global rankings				
No.	Names	Singapore (9) <sup>a</sup>	Taiwan (11) <sup>a</sup>	S. Korea (19) <sup>a</sup>	China (31) <sup>a</sup>	India (42) <sup>a</sup>
I-12.01	<i>Capacity for Innovation</i>	19	21	24	49	50
I-12.02	<i>Quality of Scientific Research Institutions</i>	12	26	27	42	45
I-12.03	<i>Company Spending on R&amp;D</i>	11	13	21	23	31
I-12.04	<i>University–Industry Collaboration in R&amp;D</i>	5	14	26	32	50
I-12.05	<i>Govt Procurement of Advanced Tech. Products</i>	4	29	24	9	26
I-12.06	<i>Availability of Scientists &amp; Engineers</i>	11	28	40	36	49
I-12.07	<i>PCT Patents, Application/million populations</i>	14	n/a	7	32	61

Note: <sup>a</sup>Overall global rank

**Table XIV.**  
Global rankings of  
the nations based on  
the indicators of P-12  
(Innovation)

start-ups, technology parks and because of relaxations provided to industries for investing in R&D in universities ([Skill Development Policy, 2015](#)).

### Conclusion

The data presented in this study clearly spell out that Singapore is not only leading Taiwan, S. Korea, China and India in the domain of economic competitiveness but it also is one of the top economically stable countries. Out of 114 indicators of GCI, it is among the top five ranked nations in 54 indicators encompassing all the three categories (“Basic Requirements” – top 5 in 23 indicators, “Efficiency Enhancers” – top 5 in 29 indicators, “Innovation and Sophistication” – top 5 in 2 indicators). Singapore tops (Rank-1) in the global rankings in 11 indicators (“Basic Requirements” – Rank 1 in 8 indicators, “Efficiency Enhancers” – Rank 1 in 3 indicators).

Taiwan is perceived to be the only Asian country which can compete with Singapore in global rankings based on GCI-2015-16 report. It has secured top 5 positions in 11 indicators out of 114 and top 20 in 40 indicators. Taiwan occupies an important position in the global economy, and many authoritative analyses done by World Trade Organization, Economist Intelligence Unit and World Economic Forum rank Taiwan among the top nations year after year. The country is a leading player in the world’s ICT sector and is also a major supplier of goods across industrial fields. According to Taiwan’s Government, the information and communication technology industry contributes to around one-third of Taiwan’s GDP ([The Official Website of the Republic of China, 2016](#)).

Taiwan, S. Korea and China have Rank-1 in the indicators of *Control over Inflation (I-3.03)* and *HIV Prevalence, %adult populations (I-4.05)*. S. Korea and China have reasonable overall GCI rankings in twenties. In addition, S. Korea ranks among the top five global economies in the areas of *Tertiary Education Enrolment* and *Internet Connectivity/100 Population*. China has Rank-2 in *Market Size Index*. This fact along with huge population has made China an international hub of commercial activities. However, these four countries can look towards Singapore for improving areas in which they are poorly ranked globally. For example, Taiwan can improve upon *Women in Labour Force*, *Ratio to Men*, *Legal Rights Index* and *Control of International Distribution*. S. Korea needs to modify its labour laws, governance of corporate boards, trade tariffs, foreign ownership of companies and easy access to secure loans. Similarly, China should take a serious relook into labour laws, establishment of a new businesses, corporate governance, adoption of latest technologies, promotion of internet connectivity, etc.

India is way behind Singapore, Taiwan, S. Korea and China, in all the three categories of GCI. There is a huge gap between India and the four Asian countries in the category of “Basic Requirement”. Because India is currently placed in the factor-driven economy category, it needs to emphasise more on improving the pillars and indicators that come under the category “Basic Requirements”. Singapore tops the list with Rank-1 globally; Taiwan is Rank-14; China and S. Korea are in the top 30 economies; and India is Rank-80. In the category of “Efficiency Enhancers”, Singapore is Rank-2; Taiwan is Rank-15; S. Korea and China are in the top 40 nations; and India is at Rank-58. In the third category “Innovation and Sophistication Factors”, India again lags behind these nations, although the margin is not as huge as in other two categories.

Not only GCI Report ranks India poorly, other global reports such as World Bank, Human Development Index and The World Fact Book have also rated these four countries ahead of India ([Table XV](#)). Because of poor hygienic conditions and limited medical facilities, the life expectancy of Indians is in mid-60s only, whereas other four countries have a much higher life span. Similarly, the literacy rate of India over 15 years is around 71 per cent, whereas all other four nations register more than 96 per cent. Only one-third of

its population lives in cities. On the other hand, Singapore is 100 per cent urbanite. Taiwan, China's and Singapore's urban population is around 78, 54 and 82 per cent, respectively. By addressing these parameters, India will not only improve the quality of life, but will also help in generating quality workforce, which in turn will boost the GDP of the nation.

Although India's global ranking is not impressive at the moment, but it has all the ingredients to become a potential force in global economy in the times to come. It has huge natural reserves, large young semi-skilled population and large land and coastal areas. The Government of India has started taking remedial steps by modifying its economic policies. The impact of such transformation is evidenced by the GDP growth rate of over 7.0 per cent, which is considered one of the best by global standards. The USA, the UK and Germany's growth rate ranges between 1.6 and 2.9 (GCI Report, 2015-16). The scientific excellence of India in the areas of space technology and information technology is acknowledged by the pundits of developed countries. A separate Ministry for Entrepreneurship and Skill Development has been established and provided with large amounts of funds to create a skilled manpower for the industrial sectors and also to encourage young minds of India to convert their novel ideas into start-up entities (Skill Development Policy, 2015). Science Parks, Technology Incubators and Higher Education Institutes along the lines of world-acknowledged Indian Institute of Technology (IIT) are being set up (Santosh Kumar and Vinay, 2010). Infrastructure (roads, airports, educational institutes) is being promoted under public-private partnership (PPP) mode (PPP India, 2005). The Indian Government is also promoting FDI (India Budget 2015-2016, 2015). These commitments have started paying good dividends as indicated in improved rankings of global agencies like World Economic Forum and various bodies of UNO. The overall GCI rank of India in 2014 was 71 and in 2015, it has jumped to 55. The Government of India is granting more powers to the states and embracing them as equal partners in India's growth targets. The improvement in the Indian economy has been acknowledged by the IMF. It has remarked that the Indian economy is in the bright spot in the global landscape and it will be one of the fastest growing and largest emerging market economies of the world (IMF Report, 2016).

The positive implication of innovation on economic competitiveness has also to be linked with systematic and industrial aspects that affect knowledge creation, transfer and application within the innovation ecosystem (Tödtling and Trippl, 2005, Krammer, 2016). Various initiatives to support firm-level innovation through tax incentives, subsidies and grants have been reported to enhance innovation (Soutaris, 2002). The upstream collaboration of industrial firms with academics and research has significant positive implications on innovation and

Attributes	Singapore	Taiwan	S. Korea	China	India
Life expectancy <sup>a</sup> (years)	82.3	80	81.5	75.4	66.5
Human Development Index (HDI) <sup>b</sup>	0.912	0.882 <sup>c</sup>	0.898	0.727	0.609
Literacy rate over 15 years <sup>c</sup> (%)	96.8	98.5	97.9	96.4	71.2
GDP <sup>d</sup> (US\$ trillion) 2014	0.31	0.53 <sup>f</sup>	1.41	10.35	2.05
GDP growth <sup>d</sup> (annual %)	2.9	-0.68 <sup>f</sup>	3.3	7.3	7.3
Urban population <sup>d</sup> , 2014 (% of total population)	100	78.0 <sup>g</sup>	82	54	32

**Notes:** <sup>a</sup>The Global Competitiveness Index 2015-2016; <sup>b</sup>The Human Development Index (HDI-2015); <sup>c</sup>The World Fact Book 2015; <sup>d</sup>World Bank -2011-2015 ([www.worldbank.org](http://www.worldbank.org)); <sup>e</sup><http://focustaiwan.tw/news/asoc/201409180039.aspx>; <sup>f</sup>[www.tradingeconomics.com/taiwan/gdp-growth-annual](http://www.tradingeconomics.com/taiwan/gdp-growth-annual); <sup>g</sup>[https://en.wikipedia.org/wiki/Urbanization\\_by\\_country](https://en.wikipedia.org/wiki/Urbanization_by_country); *United Nations does not recognize Taiwan as a sovereign state; Taiwan is not listed as a separate country for world development indicators*

**Table XV.**  
Comparative data of global agencies of select Asian countries

performance. (Belussi *et. al.*, 2010). To achieve success in this parameter of innovation and technology transfer, it is imperative for India to have a robust R&D policy along with strong implementation plan. To convert innovative research into commercial products/processes, cooperation between industry and academia (higher education institutes and R&D institutes) is of crucial importance. In India, industry–academia interaction is in its infancy and is primarily limited to some elite institutions. As per the Science, Technology and Innovation Policy (STIP), 2013, in India, the industry–academia interaction, especially in the domain of R&D, needs to be strengthened for developing novel, innovative and futuristic technologies which have either commercial value or address societal problems of the country.

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