A Study on the Impact of Various Sub Index of Competitiveness on Global Competitiveness Index – A Cross Continent Comparison

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ABSTRACT *The concept of global competitiveness is used to analyze the macroeconomic performance as well as the international trade trends of countries across the world. This is helpful to identify the position of each country in the global market. World Economic Forum has developed and is keeping on updating a separate index called Global Competitiveness index for 148 nations and rank the nations based on the same. The level of competitiveness depends on mainly three sub indices of Basic requirements, Efficiency enhancers, Innovation and sophistication factors. This study proposes to analyse the nature of impact exerted by these three sub indices on the competitiveness of different countries constituting their respective continents. Data pertaining to the Competitiveness index and the sub-indices have been collected and analysed using the Statistical package of SPSS, employing the statistical tool of Step-wise Regression. Results reveal that Efficiency Enhancers is the sub index exerting the maximum impact on Competitiveness of the 148 nations considered for this study, followed by the Basic Parameters and finally by Innovation Sophestication. This trend is prevalent in Asia alone. In the case of Arabian and African countries, Basic Parameters is exerting the maximum impact followed by Efficiency Enhancers. In the case of American and European countries, Efficiency Enhancers is exerting the maximum impact, followed by Innovation Sophestication and finally Basic Parameters.*

INTRODUCTION

Globalization has thrown many challenges on business firms, which have to compete with domestic as well as global players. Performance of business firms is immensely influenced by competitiveness of their nations which depends on their macro-economic performance and growth prospects. Highly competitive nations will succeed in offering right business environment for their firms, which will further enhance their global competitiveness.

Global competitiveness - The concept and measurement
Global competitiveness Index (GCI) is a concept which is used to analyze the macroeconomic performance of nations using a number of economic features that will help to evaluate the international trade trends for every country. World Economic Forum (in its Global Competitiveness Report), and the Institute for Management Development (in its World Competitiveness Yearbook) are conducting cross country comparisons of national competitiveness over the years.

The International Institute for Management Development defines competitiveness as "a field of economic knowledge which analyzes the facts and policies that shaped the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people."

The World Economic Forum, in its different reports of assessment of global competitiveness, used twelve pillars for competitiveness, divided into three groups of sub indexes that emphasize different aspects of market efficiency. The first group is related to the basic parameters consisting of institutions, infrastructure, macro-economic stability, health and primary education. The second group represents Efficiency Enhancers, consisting of efficiency of health and primary education, efficiency of markets and products, efficiency of labor markets, sophistication of financial markets, opening up to technology and size of capital and money markets. The third group engulfs the Innovation Sophistication Factors consisting of business sophistication of the enterprises and innovation. As an economy progresses from one stage of development to another, the nature of impact exerted by these indices on competitiveness also vary. The World Economic Forum (WEF) defines national economic competitiveness as "the set of institutions, policies and factors that determine the level of productivity of a country." The Forum calculates Global Competitive Index [GCI] using publicly available data, Executive Opinion Survey an annual survey conducted by the WEF together with its network of Partner Institutes (leading research institutes and business organizations). The WEF report assesses the ability of countries to provide high levels of prosperity to their citizens. This in turn depends on how productively a country uses available resources. Therefore, the GCI measures the set of institutions, policies, and factors that set the sustainable current and medium-term levels of economic prosperity. WEF has published its Global Competitiveness Reports since 1979 and the Global Competitiveness Index (GCI) was introduced in 2005. The 2011-2012 edition groups 142 economies into three groups of factor-driven economies (stage 1), efficiency-driven economies (stage 2) and innovation-driven economies (stage 3).

Determinants of Global Competitiveness
Harvard economist Michael Porter has written extensively on the subject and noted: "A nation's competitiveness depends on the capacity of its industry to innovate and upgrade. Companies gain advantage against the world's best competitors because of pressure and challenge. They benefit from having strong domestic rivals, aggressive home-based suppliers, and demanding local customers." However, Porter also wrote that "while the notion of a competitive company is clear, the notion of a competitive nation is not."

Academics are making systematic efforts to define meaningfully and to quantitatively analyze national competitiveness, with the determinants of national competitiveness econometrically modeled. The concept of global competitiveness is getting importance now a days and even policy makers of every country is thoroughly analyzing different parameters of competitiveness in order to identify their strengths and shortcomings and to develop suitable policies to improve their global position. Hence the studies with cross country comparison of global competitiveness are gaining momentum. Recognizing the importance of the GCI, the author has made an attempt to study the impact exerted by the three sub indices of Basic Parameters, Efficiency Enhancers and In-

novation Sophistication on GCI of countries constituting five continents.

OBJECTIVES OF THE STUDY
1. To assess the impact of the three indices of Basic requirements, Efficiency enhancers and Innovation and business sophistication of countries in different continents on their Global competitiveness.
2. To compare the results of different continents with the world results.

METHODOLOGY
The proposed study is descriptive in nature, based purely on secondary data. The scores pertaining to GCI and the three sub-indices of 148 nations for the year of 2013 have been collected from World Economic Forum website. These countries have been grouped into five continents of Asia Pacific, America, Europe, Arabic countries and Africa. The data collected have been represented suitably in tables and analyzed using the Statistical package of SPSS, employing the statistical tools of Step-wise Regression and Multiple Correlation. GCI is taken as dependent variable and the three sub-indices as independent variables.

RESULTS AND DISCUSSION
IMPACT OF SUB INDEXES ON GCI
Table 1: Model Summary

Countries	R^2	Country	R^2
All Countries	0.982	Europe	0.986
Asia and Pacific	0.982	Africa	0.984
America	0.983	Arabic Countries	0.968

It can be inferred from Table 1 that the value of R^2 is well above 0.96 for all the models, implying that the three sub indices are explaining more than 96% of variance of GCI in respect of all the five continents.

IMPACT OF THREE SUB INDICES ON GCI OF 148 NATIONS
Impact of the three sub indices on the main competitive index for all the 148 countries have been explored using Step-wise Regression and the results have been portrayed in Table 2.

Table 2: Coefficients Values for 148 Countries

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.493	.085		5.792	0.000		
	B	0.911	.021	.964	43.997	0.000	1.000	1.000
2	(Constant)	.360	.050		7.134	0.000		
	B	0.504	.027	.533	18.553	0.000	.199	5.017
	A	0.394	.023	.482	16.761	0.000	.199	5.017
3	(Constant)	.422	.045		9.469	0.000		
	B	0.330	.034	.349	9.624	0.000	.103	9.622
	A	0.390	.020	.477	19.127	0.000	.199	5.021
	C	0.177	.025	.204	7.005	0.000	.145	6.887

It can be inferred from the table that Efficiency Enhancers is exerting the highest impact on GCI in the first model. When the second model is arrived at, the same index is still exerting the maximum impact followed by Basic Parameters Index. However, in the final model, the third index of Business Sophestication enters, which diminishes the role of Efficiency Enhancers, resulting in Basic Parameters exerting the maximum impact.

Based on this results, following model can be arrived at:
Competitiveness ndex=0.422+0.330*Efficiency Enhancers+0.390*Basic Parameters+0.177*Business Sophistication.

IMPACT OF SUB INDEXES ON GCI OF AFRICA
Impact exerted by the three Sub Indices on GCI of African countries have been explored and the results have been portrayed in Table 3.

Table 3: Impact Measurement of African Countries

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.952	.194		4.901	.000		
	A	0.699	.051	.921	13.595	.000	1.000	1.000
2	(Constant)	0.234	.077		3.017	.005		
	A	0.478	.022	.629	22.074	.000	.614	1.629
	B	0.453	.027	.470	16.487	.000	.614	1.629

It can be inferred from the table that Basic Parameters is making the maximum impact on GCI of African countries, followed by Efficiency Enhancers. Based on this following model is arrived:

Competitiveness Index=0.234+0.453*Efficiency Enhancers+0.478 *Basic Parameters.

IMPACT OF SUB INDEXES ON GCI OF AMERICA
Impact of the three sub indices on GCI of American countries have been portrayed in Table 4.

Table 4: Impact on American Countries

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.754	.164		4.599	.000		
	B	0.836	.041	.972	20.614	.000	1.000	1.000
2	(Constant)	0.451	.147		3.061	.005		
	B	0.646	.056	.751	11.586	.000	.322	3.110
	A	0.241	.058	.268	4.142	.000	.322	3.110
3	(Constant)	0.450	.110		4.106	.000		
	B	0.400	.068	.465	5.846	.000	.118	8.475
	A	0.246	.043	.273	5.676	.000	.321	3.112
	C	0.265	.059	.308	4.523	.000	.161	6.212

It can be inferred from the table that competitiveness of American countries have been largely influenced by Efficiency Enhancers. In the second model, Basic Parameters comes second while the as per the third model, Innovation and Sophestication has pushed the Basic Parameters index to the third place. Based on this following model is arrived:

Competitiveness Index=0.450+0.400*Efficiency Enhancers+0.246 *Basic Parameters+0.265*Business Sophistication.

IMPACT OF SUB INDEXES ON GCI OF ASIA_PACIFIC

The impact exerted by the three sub indices on GCI of Asia Pacific countries has been portrayed in the following table.

Table 5: Asia Pacific Countries

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.543	.193		2.814	.008		
	A	0.808	.040	.962	19.966	.000	1.000	1.000
2	(Constant)	0.615	.116		5.299	.000		
	A	0.531	.044	.632	12.140	.000	.308	3.248
	C	0.328	.043	.397	7.614	.000	.308	3.248
3	(Constant)	0.516	.103		4.990	.000		
	A	0.439	.046	.522	9.569	.000	.206	4.858
	C	0.192	.054	.232	3.574	.001	.146	6.867
	B	0.250	.072	.277	3.492	.002	.108	9.246

It can be inferred from the table that Basic Parameters exerts the maximum impact on the Competitiveness Index of Asia Pacific countries. Though the second model conveys that Innovation Sophistication makes the next big impact, the final model suggests that Efficiency Enhancers is the second important factor and Innovation Sophistication is the third factor influencing the GCI. Based on the above results, following model can be arrived at:

Competitiveness
Index = 0.516 + 0.250 * Efficiency Enhancers + 0.439 * Basic Parameters + 0.192 * Business Sophistication.

IMPACT OF SUB INDEXES ON GCI OF ARABIC NATIONS
Table 6: Arabic Countries

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.010	.237		4.255	.001		
	A	0.677	.049	.970	13.722	.000	1.000	1.000
2	(Constant)	0.669	.211		3.170	.009		
	A	0.434	.086	.622	5.045	.000	.190	5.277
	B	0.374	.119	.386	3.128	.010	.190	5.277

It can be inferred from the table that Basic parameters index is exerting the maximum impact on GCI, followed by Efficiency Enhancers Index. Based on the above results, following model is arrived:

Competitiveness
Index=0.669+0.374*Efficiency Enhancers+0.434*Basic Parameters.

IMPACT OF SUB INDEXES ON GCI OF EUROPE
The influence exerted by the three sub indices on the GCI of European countries have been portrayed in the following table.

Table 7: Impact on European Countries

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-0.163	.167		-.974	.337		
	B	1.051	.036	.979	28.953	.000	1.000	1.000
2	(Constant)	0.673	.174		3.871	.000		
	B	0.586	.077	.546	7.642	.000	.106	9.435
	C	0.302	.047	.458	6.406	.000	.106	9.435
3	(Constant)	0.451	.163		2.774	.009		
	B	0.470	.074	.438	6.380	.000	.103	9.671
	C	0.241	.044	.366	5.463	.000	.110	9.072
	A	0.199	.055	.210	3.585	.001	.118	8.493

It can be inferred from Table 7 that GCI of European countries have been largely influenced by Efficiency Enhancers followed by Innovation Sophistication and lastly by Basic Parameters. Based on this, the following model is arrived:

Competitiveness
Index=0.669+0.470*Efficiency Enhancers+0.199*Basic Parameters+0.241*Innovation Sophistication.

INTER-CONTINENTAL COMPARISON OF IMPACT OF SUB INDICES ON GCI
Impact exerted by the three sub indices on **GCI** of five continents has been compared using Correlation and the results have been displayed in Table 8.

Table 8: Relationship among Continents

	148 Countries	Africa	America	Asia-Pacific	Arabian Countries	Europe
148 Countries	1					
Africa	.974	1				
America	.133	.356	1			
Asia-Pacific	.856	.715	-.399	1		
Arabian Countries	.989	.997	.279	.769	1	
Europe	.102	.327	1.000*	-.427	.249	1

can be inferred from the table that Asia Pacific, Africa and Arabian countries follow similar pattern as far as impact of three sub indices on their competitiveness, while Europe and America follow a similar pattern. However, the 148 countries studied follow the former pattern.

INFERENCES
Basic Parameters is the sub index exerting the maximum impact on Competitiveness of the 148 nations considered for this study, followed by Efficiency Enhancers and finally by Innovation Sophistication. This trend is prevalent only in Asia Pacific. In the case of Arabian and African countries, Basic Parameters is exerting the maximum impact followed by Efficiency Enhancers. In the case of American and European countries, Efficiency Enhancers is exerting the maximum impact, followed by Innovation Sophistication and finally Basic Parameters. Hence, American and European countries are displaying the symptoms of development, while Asian countries are displaying developing trend while the African and Arabian countries are displaying an under developed trend.

CONCLUSION
African and Arabian countries are still in the factor-driven stage of development while American and European coun-

tries have surpassed the factor-driven phase and are in the threshold of marching towards the Innovation-driven phase from the Efficiency-driven phase. Asian countries have surpassed the factor-driven stage of development and have reached the efficiency-driven stage, which is one step better than the African and Arabian countries.

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