

Penetration Rate in the Virtual World and its Effects on Economy

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Abstract

The Information and Communication Technology (ICT) sector, for its potential to generate huge economic and social development, has been the buzzword for all the business discussions and research in last two decades. In this paper, the authors have analyzed the growth rate of the Internet in terms of active and passive users in a global scenario. The data from various internet research organizations has been consolidated and used to deduce that the penetration of Internet, in the developed as well as developing economies of the world, is consistently increasing. As the number of users of the Internet increases, it would either have a positive or a negative impact on the economy of the country. The direction and extent of the effect has been studied in this paper.

Keywords: ICT, Penetration Rate, Active Users, Sustainability

1. Introduction

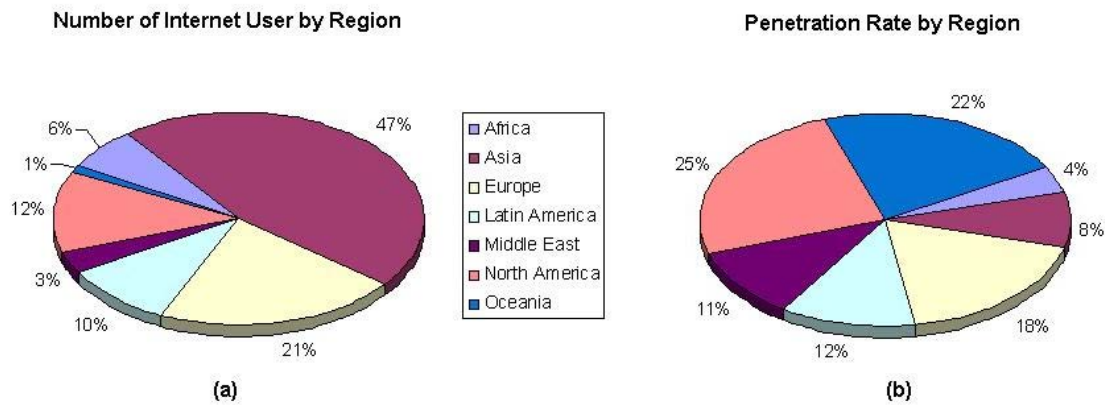
The ICT infrastructure has been growing at an unprecedented rate for the last two decades and so has been the growth of the active and passive users wired to it. In the web terminology the term active user is used for those who use internet frequently and those who use it less often are called passive users. The authors have observed that the growth rate of the active users has been much faster as compared to the passive users, so all internet users have been considered as active users for this study.

The tremendous growth of the internet has enabled or empowered various entrepreneurs and organizations to develop new business models and adapt their existing models to effectively utilize the ICT technologies for their economic growth. Although some part of this economic development has come from the establishment of the pure internet players organizations (Companies which would have not existed without internet) but majority of the economic development has come from the use of ICT technologies to increase productivity and efficient resources utilization in the traditional companies. In some companies the information technology has taken away the complexities and enabled the organization to focus on more important areas. In other cases, it has passed on the responsibilities of the company to the customer in terms of designing their own customized products.

The digital divide between the “information have and have-nots”, though being bridged with every passing day, is huge, currently the third world countries are striving vigorously to catch up with their developed counterparts in term of providing affordable and reliable informational and technological access to its netizens. The trend is clear from the analysis done by the authors as the penetration level of the ICT in the developed and developing countries varies a lot. There are numerous regional and political factors effecting the growth of the ICT sector in various regions of the world, for instance, North Korea and South Korea have a similar geographical environment and regional capabilities but one has a penetration level of more than 82 percent as the government is not only providing conducive environment, but also encouraging development of ICT whereas the other country has less than 2 percent penetration as the government is skeptic about the peril and hazardous potential of ICT. The

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Exhibit 1:

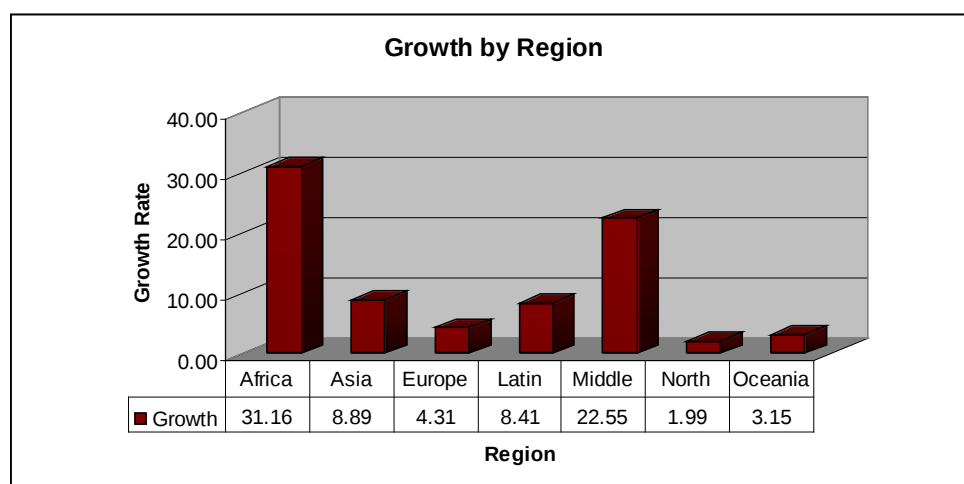
second section of this paper illustrates the growth trend followed by the Internet using the global data and finding out the difference in the level of Internet penetration in the developed and the developing economies and various regions of the world.

The million dollar question that needs to be answered is that beyond the disparities of penetration rates in the first world and third world countries, what is the economic impact that it has on the countries in particular and their respective regions in general. The economic impact of the ICT mainly comes from the integration and use of the ICT by the individuals, government and Small and Medium Enterprises (SMEs), how they use it to reach global audience, how supply chain is improved, how they unleash the information provided by the Internet, what new business models are developed to realize the potential

of ICT etc. In the third section of this paper the impact of the penetration of Internet on the global economy is analyzed considering per capita GDP which is the single most significant measure that demonstrates the economic growth.

2. Internet Penetration

The Internet has been changing the way organizations do business, the way people communicate and interact and the way they lead their lives. It is a known fact that the number of users on the internet is increasing every moment. According to the latest data of the ITU, the total number of world's population that is connected to the internet is around 2.2 billion, which is slightly higher than the one-third of the total population of the world. The analysis of the penetration rate of internet in various

Exhibit 2:

countries has been done using the statistical method by collecting the data for about 220 countries of the world out of which 166 countries which have a population of more than 300,000 were used for analysis and these countries account for almost 99.2% of total world's population. The countries have been divided into various regions and the penetration level of the internet in various geographical regions is shown in Exhibit 1(a), it shows that 47% of the total internet users are in Asia which is much higher than that of Europe and North America, but this figure is only an illusion that hides the fact that the penetration in Africa and Asia are only about 13.5% and 26.3%, whereas the penetration in North America and Europe is 78.3% and 58.4% respectively as shown in Exhibit 1(b).

The penetration level of the African and other developing regions might look bleak initially but when we analyze

the growth rate of the last decade, we observe that the growth rate in Africa and Middle East has been 310% and 220% respectively which means that number of internet users in Africa and Middle East is increasing at the rate of 3.1, 2.2 times respectively in the last decade, whereas in case of North America and Oceania, the growth rate is only 20% and 31% respectively (Exhibit 2) mainly owing to the saturation of Internet in these parts of the world. The average growth rate of the internet user for the world has been estimated to be around 55% since 2000.

While analyzing the penetration rates in the individual countries, it has been observed that there are countries like Iceland, Norway and Sweden which top the list with more than 95% penetration, and a total of twenty countries including United States and United Kingdom have a penetration level of more than 75%. At the other

Exhibit 3:

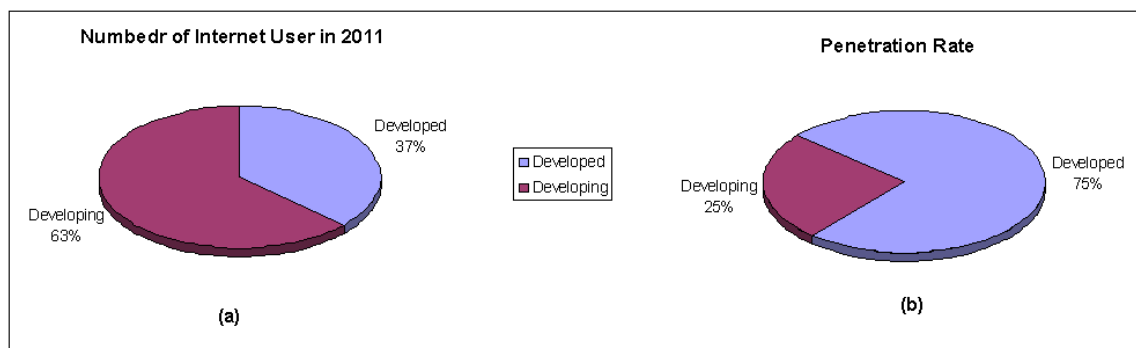
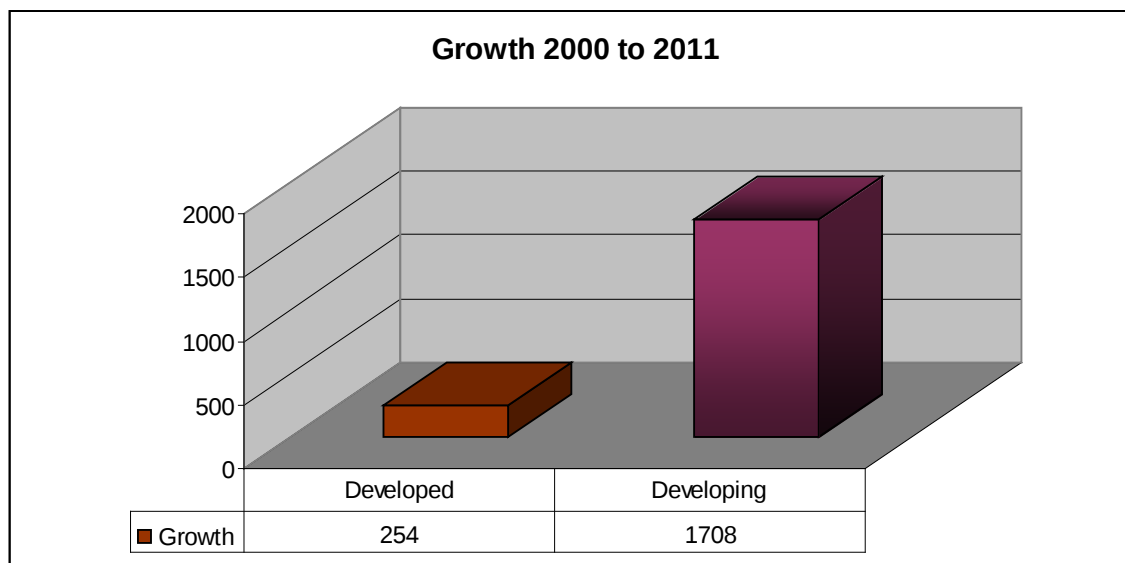


Exhibit 4:



end, there are about 49 countries which have penetration level of less than 10% and India is just above this group with 10.20% internet users where as our neighbors China and Pakistan have penetration rate of 38.40% and 15.50% respectively.

To verify the impact of the internet penetration rate on the economy of the countries, the sample countries were categorized as the developed and developing countries on the basis of the World Bank's classification of the economic status, which is based on the per-capita income basis. Accordingly, the country which has more than \$6,000 per capita in 1987 prices is considered as developed country. Although the World Bank categorizes other countries in various category nomenclature such as Upper Middle Income, Lower Middle Income and Low Income economies, all these have been categorized as developing countries for the purpose of this study.

Out of 166 countries in the sample group 46 countries have been found to be developed and rest of the countries are developing economies. The Exhibit 3(a) shows the number of internet user in the developed and developing nations of the world, it has been observed that almost two-third of the internet users are located in the developing economies of the world and the developed countries account only for one-third of total internet population. A situation is completely inverted when we look at the penetration rate in the two categories as can be seen in Exhibit 3(b) that the penetration rate in the developing economies is only 25% whereas the average penetration rate in the developed nations is 75%.

If we analyze the growth rate of these two categories of economies as shown in Exhibit 4, the economists again get a reason to cheer as the growth rate in the developing countries is much more as compared to the developed countries mainly owing to the saturation of the internet in the developed countries.

(Growth in developed countries has been 2.5 times whereas in developing countries it is 17 times)

3. Economic Impact

The ICT sector has a profound impact on the economic sustainability of the economies of the world. It effects both the developed and developing nations thereby creating what we call a "Global Economy". The economic impact of ICT comes from various factors such as increase in

productivity of the organization, better utilization of resources, wider reach of the SMEs to global audiences, integration of SMEs in the national and international supply chain, collaboration among macro and micro industries, etc. The preceding discussion regarding the Internet penetration gives us an important insight into the relationship among the use of ICT and the economic performance of the countries. In the sample group we have observed that out of 36 countries which have penetration level of more than 60%, 32 are developed economies and only 4 are developing economies whereas the top 24 countries in the order of penetration are all developed countries.

There is still scepticism regarding the economic impact of the Internet as the individual, organization and government are still in a state of flux regarding the magnitude of the same. Some recent researches have shown that Internet delivers astonishing value to the economy of the country. The advent and growth of internet is sometimes compared to the introduction of the print media about couple of centuries ago, but a better analogy would be the electricity or automobile industry which not only changed the fortune of their innovative entrepreneurs but the complete landscape of the world. Internet also, like these technologies, has affected the whole world and not only the countries in which it was developed.

To analyze the effect of the internet penetration rate on the economy of the country, the authors have collected the data for the per capita gross domestic product of the sample countries from the World Bank database and the correlation between the two has been established using the statistical tools, the result of correlation appears in Table 1.

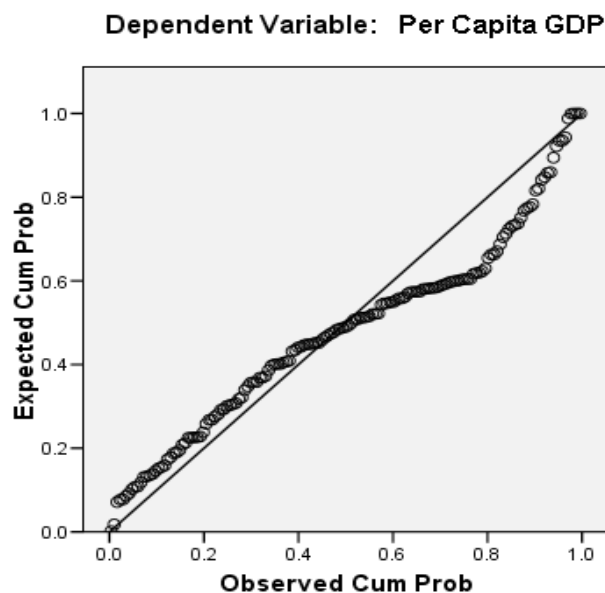
Table 1: Correlation between Penetration Rate and Per Capita GDP

		GDP_PC	Penetration
GDP_PC	Pearson Correlation	1	.722(**)
	Sig. (2-tailed)		.000
	N	159	159
Penetration	Pearson Correlation	.722(**)	1
	Sig. (2-tailed)	.000	
	N	159	166

** Correlation is significant at the 0.01 level (2-tailed).

The correlation represents high degree of positive correlation (0.722) between internet penetration and per capita GDP, and this relationship is highly significant as value of $p(0.000)$ is less than .01 at one percent level of significance. Also the correlation is represented in the Exhibit 5, which shows that the actual value of the per capita GDP is very close to the expected value of the straight line representing the perfect correlation.

Exhibit 5:



The results of the correlation have been further strengthened by running the regression between the two variables by taking per capita GDP as the dependent variable and internet penetration as independent variable. The result of regression appears in Table 2 below.

Table 2: Model Summary(b)

Model	R	R Square	F	Sig.
1	0.722	0.521	170.887	0.000

a Predictors: (Constant), Internet Penetration

b Dependent Variable: Per Capita GDP

The relatively high measure of variance (R Square=0.521) indicates that the internet penetration level has done a good job of explaining the variance in per capita GDP, and the highly significant F statistics ($F=170.887$, $Sig.=0.000$ at 1 percent level of significance) strongly support that the results have not occurred by chance.

Regression produces standardized measures (beta weights) of the strength of the predictor variable with dependent variable, the value of beta in this study (.722) represents high level of strength association between internet penetration and per capita GDP.

4. Conclusion

It is evident from the above analysis that the economy of the country is effected positively and substantially by the penetration level of the internet in the country. The internet is still at the age of infancy in most of the developing economies and has a tremendous potential which is still to be leveraged and this would lead to rapid growth in the times to come.

In the wake of the current and past financial crisis, it is becoming difficult for the economies to start effective financial stimulus for growth, so what should be the driving force to kick start the progress again, the partial part of the progress has to be driven by the increased and varied use of ICT to propel the economic growth and raise the standard of living for the current and future generations. This sustainable development of the ICT sector would require a coordinated effort from the individuals, organizations and the government establishments of the world, should contribute to the development of the sector and mitigate the effect of the security breaches and privacy concerns which plague the development of the ICT sector.

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