If Bill Gates Is Skeptical About The Growth Of The Internet, Then Shouldn't We Be AS Well?

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- Tuesday, 07 November 2000

Internet usage in the United States has reached a plateau, according to a recent technology survey by consultants PwC, and Europe is not far behind. PwC's fourth annual technology study found that 44 per cent of Americans access the Internet, compared to 38 per cent in Australia, 31 per cent in the United Kingdom, 31 per cent in Germany and 16 per cent in France. These numbers might imply considerable scope for further Internet penetration, until we consider the following: in 1999, US Internet penetration stood at roughly the same level of 43 per cent. More ominously for the Internet bulls, usage has gone down. According to Robert Boyle, PwC's director of European media: "Penetration in the US seems to have almost peaked, or at least plateaued. In the US, usage went down from 5.3 hours a week to 4.2 hours a week…" Although Boyle also pointed out that European usage went from 2.4 hours a week to 3.2 hours a week, the US figures cited in the survey suggest that the Europeans too are not too far away from saturation, again calling into question the optimistic exponential growth rates which have long underpinned analysts' assumptions about the Internet's growth, as well as the prospects for a whole host of industries predicated on this Internet expansion, such as wireless communications.

Investors have been bombarded almost daily with predictions of virtually unlimited worldwide growth of both Internet users and wireless subscribers. Wall Street analysts attempt to justify absurd stock valuations on the basis of In-Stats' prediction of 1.87 billion wireless subscribers worldwide by 2004. In a 260+ page industry piece, one Wall Street firm predicts either 1.3 or 1.9 billion Internet users worldwide by 2009, depending on which page of the report one reads. IDC predicts 1 billion Internet users by 2010. We have seen other Wall Street firms predict 1.6 to 1.9 billion wireless subscribers by 2005, 92 per cent wireless penetration rates in the U.S. by 2009 and 75 per cent U.S. Internet user penetration rates by 2005. But the PwC survey appears to suggest that the estimates are far too optimistic and, indeed, that the Internet itself might be falling out of fashion as the declining hourly usage in the United States indicates. The study also suggests that a 75 per cent penetration rate is far too optimistic an assumption; at less than 50 per cent of the population, saturation dynamics are coming to the fore, a phenomenon which has ominous implications for companies that have taken on loads of debt in order expand infrastructure on the basis of a 10 to 13-fold increase in Internet activity over the next several years. We have hitherto assumed some increase in Internet penetration over the next ten years, but the PwC study appears to suggest decreased usage going forward, which has catastrophic implications for the new economy as a whole. There appear to be serious impediments to achieving such high penetration rates, especially on a worldwide basis. Even domestically, optimistic assessments appear to ignore basic limitations, such as the fact that there are currently 35 million Americans living below the poverty line, or 12.7 per cent of the entire population. This further circumscribes growth in the developed world. As far as the emerging world goes, it appears as though many of these prognosticators are overlooking such basic things as demographics, economics and literacy rates when making these predictions. No less an authority than Bill Gates seems to be drawing the same conclusions.

If patriotism truly is the last refuge of a scoundrel, as the great Dr. Johnson once noted, then the emerging world must surely constitute the last refuge of the Internet bulls. Sure, the

Internet bulls might concede, the developed economies of the world might be close to saturation (although we doubt this concession would have been made just two years' ago), but what about the billions of people in countries such as China and India? Well, we can think of no better rebuttal than that expressed recently by Microsoft founder Bill Gates, who publicly questioned the premise that "market drivers" could be used "to bring the benefits of connectivity and participation in the e-economy to all of the world's six billion people", (to quote directly from materials distributed at the recent "Creating Digital Dividends" conference held in Redmond, Washington). Gates expressed something which to us seemed blindingly obvious, but does not seemed to have crossed the minds of Wall Street's finest in their endless attempt to rationalise the absurd valuations of this industry:

"I mean, do people have a clear view of what it means to live on $1 a day," asked Gates. "There's no electricity in that house. None…You're just buying food, you're just trying to stay alive." Conjuring up an image of an African village receiving a computer, Gates said: "The mothers are going to walk right up to that computer and say, 'My children are dying, what can you do?' They're not going to sit there and like, browse eBay or something. What they want is for their children to live. They don't want their children's growth to be stunted. Do you really have to put in computers to figure that one out?"

A good question, which seems to have provoked disappointment and scepticism from other attendees at the conference, rather than a genuine questioning of their techno-optimism. John Gage, the chief research officer for Sun Microsystems, countered that the declining costs of cell phones and other hand held mobile technology would soon make them worthwhile to even the poorest people in the world. Gage's repost can be attacked on two major grounds. On the one hand, the current valuations of most of today's Internet and wireless communications companies do yet reflect the commoditisation implied by Gage's point about a rapid fall in the costs of cell phones and other types of hand held technology sufficiently large enough to engender massive diffusion rates in the developing world; these companies are valued in the stock market as high-margin growth businesses with significant barriers to entry, not mass-volume low cost commodities. Second, Gage's point seems to ignore more fundamental limitations in the emerging world: basic literacy rates, miniscule per capital incomes, insufficient infrastructure, the sort of things to which Gates alluded when making his remarks.

Let us look at these points in more detail. Per capita income levels of this type in the emerging world imply difficulties in obtaining basic electricity to power up a computer in order to surf the net. Then there are basic questions of literacy; according to the Population Reference Bureau, 31% of the World's population is under the age of 15 compared to about 21% of the population in the US. UNESCO estimates that the overall illiteracy rate for adults (defined by people over the age of 16) in the World is 21% compared to less than 2% in the US. If we combine these two statistics, then we can calculate that the number of people that are over the age of 15 that are also literate is approximately 3.3 billion or 55% of the World's population. Any estimates for Internet or wireless users should be based on a number closer to 3.3 billion people who can read and are old enough to have a job and not the 6 billion people in the World today. We wonder if John Gage and other analysts fully understand that illiteracy is a major impediment to the growth of Internet and wireless users worldwide. Below is a table listing the percentage of the adult population that is illiterate in the largest developing countries by population according to Literacyonline.org.

China	19%
India	48%

Indonesia	16%
Brazil	16%
Pakistan	62%
Bangladesh	62%
Nigeria	43%
Mexico	10%
Turkey	17%
Ethiopia	64%
Egypt	48%

Illiteracy among women in these countries runs from about 27 per cent in China to over 60-70 per cent in countries like India and Bangladesh. This is significant because almost 50 per cent of the current Internet population is made up of women. In India and Pakistan, the median grade completed among 15-19 year olds from the bottom 40 per cent of households is ZERO. U.S. Treasury Secretary Lawrence Summers recently told a UN forum on information technology "in large parts of Africa today, young girls are more likely to die before reaching the age of 5 than they are to learn to read." Even the most ardent Internet optimists would likely concede that basic reading skills have to precede computer literacy.

We also have serious doubts as to whether the analysts concerned are taking these simple demographic facts into consideration when they make their estimates. For example, if the 2 billion wireless subscriber number by 2005 estimate is to be believed, then approximately 57 per cent of people 16 years of age and older that are literate in the world will be using a wireless phone by then. In a more conservative vein, Strategis is estimating that there will be only 1.2 billion subscribers in 2005, up from an estimated 530 million today. That is still 34 per cent of the entire literate adult world population. There are only about 800 million literate people in all of North America and Europe. If Allied Business Intelligence's prediction of 160 million wireless subscribers in the US in 2005 is correct, then 87 per cent of the world's wireless subscribers will live outside of the US, which seems hardly credible in light of the foregoing limitations. At the same time, the ARC Group predicts the number of mobile wireless data users will be 1.2 billion worldwide by 2005. Apparently all of the wireless subscribers Strategis forecast would be wireless data enabled, an assumption that certainly does not jibe with the PwC survey on technology.

Basic development economics is another part of the equation that the analysts seem to be ignoring. The nine nations representing the highest per capita income account for 60% of the total world GDP. The top 57 nations represent 90% of the world GDP. Put another way, 70% of the world's population receives only 10% of the total world income. According to the World Bank, the income levels of the world's population break down as follows:

In billions	
Low-incomeCountries	2.4
Middle-income Countries	2.7
High-income Countries	.89

Only 900 million people in the world live in countries that are considered to have high incomes. The World Bank also estimates that 2.8 billion people are living on less than $2 a day in income, 630 million of these people live in China alone (50% of China's population). The World Bank may be significantly underestimating the poor in China. The Chinese government estimates that the nation's 860 million farmers earn only $67.65 per year. Almost half the world's population lives on less than $60 a month or $720 a year. Consider that Media Metrix estimates only 9.7 per cent of Internet users in the US earn less than $25,000 per year. In America, 6 million people live in households that make less than $5,000 a year. The cost of a computer and a year's worth of Internet access exceed the yearly wages of half the world's population. As Uwe Afemann writes in his report, Internet for the Third World – Chance or Threat?, "If we compare the $30 monthly income of the poor with the $75K yearly income of a common Internet shopper, it certainly raises the question about the importance of Internet access for people in developing countries." We agree very strongly with that statement.

Another factor that will circumscribe the growth of the Internet is the composition of the work force in the developing nations. One reason why such a large percentage of people in the world make less than $2 a day is the fact that most of these people are engaged in farming. The table below shows the percentage of the working population that is engaged in agricultural activities in the largest developing countries. As Bill Gates correctly noted, these are people that are barely able to feed themselves, let alone contemplate surfing the net.

% Of Working Population Engaged In Farming Activities

China	50%
India	67%
Indonesia	41%
Brazil	31%
Pakistan	47%
Bangladesh	65%
Nigeria	54%

Unemployment rates in these countries range from 18-35 per cent. The International Telecommunications Union (ITU) stated in a 1999 that fewer than 6 per cent of Internet users are found in developing regions of the world, which account for 84 per cent of the world's population. In light of the foregoing demographic and economic figures, the scepticism of Gates seems eminently justified: it is inconceivable to us, given these per capita income and literacy levels that the developing world will be able to contribute anywhere near the number the "digital dividends" hoped by the participants at the recent Seattle conference.

Finally, there is the question of infrastructure. A developed communications network is absolutely essential for the rapid expansion of the Internet and the wireless revolution. But consider the costs involved in developing this infrastructure in the developed world, which are already creating tremendous alarm amongst banking regulators and investors in Europe and North America. According to CTIA, cumulative capital investment in the US wireless industry thus far is $71 billion. Year-end subscribers were 86 million or $825 per subscriber. Cumulative investment to get the first 43 million subscribers was $32 billion. It

took another $39 billion to get the next 43 million subscribers. If there are 1.8 billion wireless subscribers worldwide in 2004, well over 1 billion will be coming from countries that are less developed from a communications standpoint than the US. Even if we only use $400 per subscriber for the cost of the infrastructure for just the one billion subscribers outside the developed world, that would still be over $400 billion. The actual figure is probably closer to $800-$900 billion.

Comparable problems of cost also exist in Europe, where governments have almost completed the process of auctioning off higher bandwidth spectrums in order to facilitate the development of third generation mobile phones. However, the sums paid in the auctions thus far in Britain and Germany have been far in excess of analysts' earlier expectations. In Germany, for example, six bidders have just agreed to pay a total of $45 billion for a clutch of German wavelengths. Britain's auction raised a further $33 billion. Although recent 3G auctions have seen less frenetic bidding, the damage to these companies' balance sheets has already been done. As Duncan Warwick-Champion of S&P's European corporate ratings team pointed out post the German auction, "six instead of five (meaning German licensees) means competition will become more fierce in the German market than we expected. We are more negative on the UMTS (Universal Mobile Telecommunications System) than the equity analysts. Generally, we view debt financing to be negative, and we expect large capital expenditures for network construction and service deployment." And these large capital expenditures appear to be predicated on Internet growth rate assumptions which are nowhere near those implied in the Price Waterhouse technology survey. What does this suggest for the companies whose balance sheets have ballooned with debt in anticipation of these exponential growth rates of Internet usage continuing well into the next decade?

Given the alarm bells being set off in Europe, it hardly seems possible to imagine a comparable scale of financing taking place in the developing world. Let us take a look at China's telephone infrastructure as one example, and compare it to projections that are being made by today's Western investment bankers. Zhenzhou Lei, Pres., Telecom Science & Technology Information Research Institute of China's Ministry of Information Industry was quoted in May of this year saying China had 8.9 million Internet users at the end of 1999 and that the number of users was doubling every six months. If China maintains that growth rate, then every person in China would be on the Internet by July of 2003. He did have a moment of apparent clarity and predicted that China would have 60 million subscribers by 2003 or a growth rate of about 60 per cent a year. This again sounds somewhat reasonable when presented in this context. However, let's look at how many phone lines and computers it would take to get to those 60 million Chinese subscribers. China only has about 125 million phone lines today and is adding about 24 million a year or about 20 per cent per annum. If China can maintain that pace until 2003, then China would have about 200 million phone lines or one phone line for every seven people. If Mr. Lei's projections were to be believed, then one out of every three people in China that has a phone line would be on the Internet. Keep in mind that almost 900 million Chinese or three-quarters of the population currently live in rural areas and earn $68 a year. At what cost can the requisite investments be made?

Looking at it another way is even more revealing. The World Bank estimates that there are 9 personal computers per 1,000 people in China or about 12.5 million computers. China's state-run Internet Network Information Centre (CNNIC) estimated in 1999 that 1.46 million computers were connected to the Internet supporting 4 million Internet subscribers or roughly 2.75 Internet users per computer. Since only one in three Chinese Internet users can be logged on at a time, the 4 million Internet users in China are really worth only one-third of a US user. Therefore, even if China does reach 60 million users in 2003, they should not be considered

equal to 60 million users in the US, the huge discrepancy in incomes aside. If we reduce the number of users per computer connected to the Internet, then one needs to have 30 million computers connected to the Internet by 2003. However, even if we triple the total computer penetration rate to 30 computers per 1,000 people or use a growth rate in computers that is double the growth rate of phone line installations, then there would only be between 35-45 million computers in China in 2003. That means roughly 75-90 per cent of all computers in China need to be connected to the Internet by 2003 compared to the 12 per cent today. One last thing to consider is that only 470 million people speak English. English is the primary language of only about 350 million people, yet over 90 per cent of the information stored on Internet is in English.

And, of course, all of these projections assume that the Internet truly is the world-shattering force of 21st century technology that its apologists claim it to be. The PwC report casts serious doubt on that. Usage in America is now on the decline and we have not even managed to reach 50 per cent diffusion rates in arguably the most technologically advanced and literate country in the world. A number of Americans use the Internet to follow the stock market. What happens to this level of interest when we have bear market? This would imply that, contrary to expectations, the Internet is looking less like the first growth industry of the 21st century, and more like a basic everyday utility in which a large part of the population will have little interest. But if the Internet turns out to be no more than a passing fancy, what cost to those businesses that have taken on billions of dollars of debt on the expectation of a 10-fold increase in Internet-related activity? These are not peripheral names we are thinking about. Declining "web connectivity" has tremendously negative implications for companies as large as IBM, Cisco and AT&T. Forget about the current stock valuations. Questions about viability might soon become more relevant as the survey indicates that saturation dynamics are already upon us in the developed world. And, as for the emerging world, we're inclined to the view of Bill Gates: "Anybody who says, 'Oh sure, we'll sell to the people who live on a dollar a day,' they just don't get it."