

# **Broadband Access: Its prospects in Jamaica**

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## **Abstract**

*Many authors within the telecommunications industry in recent times have heralded broadband as the future for service delivery. While this is already the reality in many rich nations it may be a distant reality for many others. This paper seeks to assess the potential, future and likely development of broadband in Jamaica, given the present regulatory and telecommunications infrastructure. It seems that Jamaica may be well on its way to obtaining large scale broadband access in the not so distant future, in the light of two additional submarine cable operations slated to enter the local telecommunications market. However, this is just one aspect of broadband access as the issue of providing access to the 'last mile' is still pretty much pertinent. In addition, the challenges that this technology will present for the legal framework that governs the telecoms sector as well as the regulatory agency must be considered. The usual factors such as income levels, pricing models (price), education levels, role of government, persistence of competitive market force and, support from regulatory framework were all cited to be of utmost importance in promoting ubiquitous broadband access.*

Keywords: Access, broadband, digital divide, internet, infrastructure, market size

## Table of Contents

<b>1. Introduction.....</b>	<b>4</b>
1.1 Broadband defined.....	4
1.2 State of Broadband Globally.....	5
1.4 The Legal Framework and Regulatory Framework.....	8
1.5 Background.....	9
1.6 The Current State of Competition in the Local Telecommunications' Markets.....	9
<b>2. The Demand Side .....</b>	<b>11</b>
2.1 Competitive Safeguards.....	14
2.2 Potential Market Size.....	15
2.3 Income Levels.....	17
2.4 Government/ ICT Policy.....	17
<b>3. The Supply Side .....</b>	<b>19</b>
<b>4. Regulatory challenges of broadband service.....</b>	<b>21</b>
4.1 VoIP.....	22
4.2 3G.....	24
<b>5. Closing Remarks .....</b>	<b>24</b>

# 1. Introduction

## 1.1 Broadband defined

There are a number of definitions for broadband. Invariably though, all the definitions do express a common sentiment. According to Newton's Telecom Dictionary, broadband is defined as "a transmission that has a bandwidth, or capacity<sup>2</sup>, greater than a telephone line". Others compared broadband to be a huge pipeline connecting to the internet. In more technical terms however, broadband is a permanent high-speed network connection with data speeds in excess of 128 kilobits per second (Kbps). However for the purpose of this document the latter definition of broadband is used.

Notwithstanding the aforementioned definitions International Telecommunications Union (ITU) subscribes to a more stringent appreciation of broadband. Recommendation 1.113 of the ITU Standardization Sector defines broadband as a "transmission capacity that is faster than primary rate Integrated Services Digital Network (ISDN) at 1.5 or 2.0 Megabits per second (Mbps) (ITU, 2005). One vital component of broadband pipe is that it must be of digital technology.

A broadband facility of sufficient bandwidth can transmit data, voice and video simultaneously. It is widely agreed though that what is considered broadband today may not be considered broadband in the future. This is in light of the meteoric development of technology in this area, where increasingly more can be transmitted in the same or less time.

Broadband can be transmitted by wired technologies such as Digital Subscriber Line (DSL), cable, fibre and wireless technologies such as Wireless Local Area Network (WLAN), Wifi, 3G, and Wimax.

Broadband has led to a whole new range of telecommunication services such as high capacity data transfer, video conferencing, video on demand, interactive games, real-time voice services and Voice over Internet Protocol (VoIP) and other Internet Protocol (IP) type services.

Like any other new technology, broadband brings the prospects of profound economic gains for government, businesses and consumers alike. With increased new medium for global communications and connectivity, it saves time and money and raises productivity and improves efficiency, inter alia. The Telecommunications Industry Association (TIA) noted quite clearly that broadband is a clear accelerator of economic development. The potential gains of broadband have forced many governments around the world to adopt policies gear toward fostering and promoting competition in broadband access. Broadband access (especially to rural areas) has become key to governments' Information and Communication Technology (ICT) policies. As such, many ICT policies have been geared towards this end. The lack of a vibrant broadband market in

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<sup>2</sup> See <http://www.cable-modem.net/features/jun00/wpaper.html>

Jamaica is a serious impediment to foreign investment. Developing economies in other parts of the world with very good access have experienced significant economic development through network infrastructure such examples include Malaysia, Korea and recently China and India. Broadband infrastructure has allowed for continued network improvement access not only in their respective countries but has also attracted foreign investment dependent on these infrastructures. One such sector is the ICT sector.

Additionally, broadband has led to the advent of a whole range of new products and services. Broadband has very far reaching application and has and will improve critically the delivery and quality of a number of other services. Today broadband has found its application in telemedicine, Tele-working, E-government, Agriculture, Distance learning,<sup>3</sup> National Security, Tourism, Entertainment Activities, Public safety, among many others<sup>3</sup>. The future of broadband lies in its applications.

The pace of broadband development depends critically on how fast it is applied to the provision and delivery of the various services. Broadband, it seems is designed to revolutionize our lives, make the way of doing things much easier, faster and improve on delivery and quality. It has clear implications for national security and notably providing greater access to markets and improving the information flow for the agricultural sector.

## **1.2 State of Broadband Globally**

According to the 2004 Global Broadband Market Report- Market Research Report, under the auspices of Mindbranch, by 2004 broadband subscribers numbered over 100 million. This report contended that the rate at which its growth is accelerating the number of subscribers will double within the next year or so. The report hastened to add however, that its expansion is hindered by the lack of infrastructure development, due largely to the present business models and the workings of incumbent telecommunications companies.

It is expected that wireless technology will play an increasing role in broadband access. The wireless technologies expected to lead the way are Ka-band Satellite, and Wireless Local Area Network (WLAN). However in many areas, such as Latin and South America Asymmetrical Digital Subscriber Line (ADSL) technology is the rising star in fixed-line broadband provisioning<sup>4</sup>. As a matter of fact DSL<sup>5</sup> technology has the largest share of the world's broadband market and remains the most popular<sup>6</sup>.

A look at the world's broadband access, penetration and uptake show Korea is leading the way. Latin America, while accounting for only 2.76% of the world's broadband pie, is the world's fastest growing region in terms of broadband uptake in the year 2004

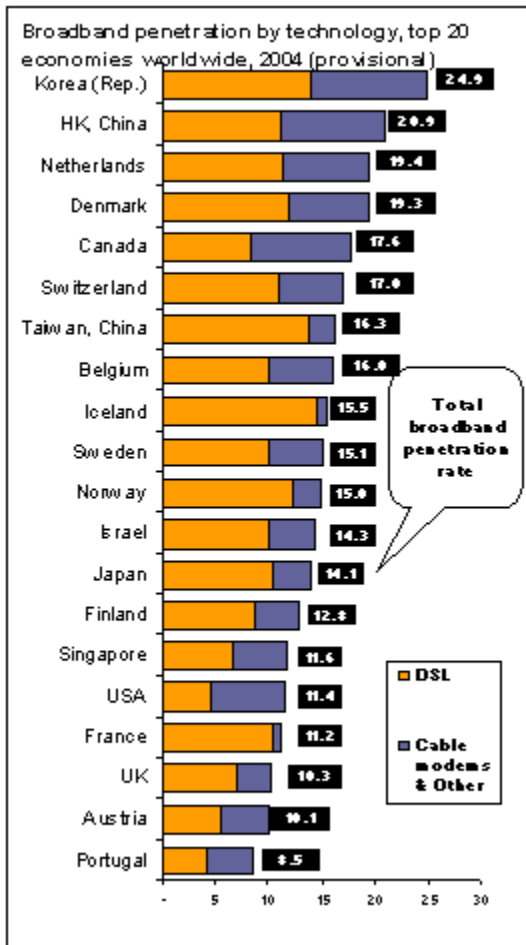
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<sup>3</sup> Taken from Telecommunications Industry Association (TIA), *The Economic and Social Benefits of Broadband Deployment*.

<sup>4</sup> 2005 Latin America Telecoms, Mobile and Broadband- Overviews – Market Research—see <http://www.mindbranch.com/products/R170-0555.html>

<sup>5</sup> DSL implies that upload and download speed to the internet are the same as opposed to ADSL where upload and download speed to the internet are different.

<sup>6</sup> See [http://www.dslforum.org/PressRoom/news\\_12.08.2004\\_sub.html](http://www.dslforum.org/PressRoom/news_12.08.2004_sub.html)



according to market research. Brazil, Argentina, Mexico and Chile are leading the way in this region.

According to the Office of Communications (Ofcom)<sup>7</sup>, 15% of homes in the United Kingdom have broadband and DSL services are available to 84% of UK homes and businesses.

The United States of America has broadband market penetration of 28.6% of the population in 2004 and is expected to grow to nearly 50% by the end of 2009<sup>8</sup>. Globally speaking though, the US is still the leading broadband country with 36.5 million lines. China remains in second place followed by Japan, South Korea, France, Germany, UK and Canada. The UK is leading growth in the G7 Rankings<sup>9</sup>.

In terms of broadband penetration rates (as defined as the number of subscribers per 1000 inhabitants), Korea leads the world followed by Hong Kong, Netherlands,

Denmark, and Canada. The United States is ranked at number 16 (ITU, 2004). See figure adopted from ITU above for further details.

### 1.3 Internet Access/ Digital divide

In assessing broadband access it is important to have a fair understanding of the present state of internet access globally and locally or the level of digital divide as it exists locally. This is vital to assessing the future of broadband access as even though internet access does not necessarily implies broadband access it remains a crucial determinant of broadband access. In addition broadband is necessary to maximize the benefits of internet access. This situation therefore put the issue of the digital divide to the forefront. According to Webopedia.com, digital divide is “the discrepancy between people who have access to and the resources to use new information and communication tools, such as the internet, and people who do not have the resources and access to the technology”. The term also describes the discrepancy between those who have the skills, knowledge and abilities to use the technologies and those who do not. The digital divide can exist between those living in rural and urban areas<sup>10</sup>.

<sup>7</sup> Ofcom is the telecommunications regulatory authority in the UK.

<sup>8</sup> See <http://blogs.zdnet.com/ITFacts/?p=8249>

<sup>9</sup> See <http://blogs.zdnet.com/ITFacts/?p=8160>

<sup>10</sup> See [http://www.webopedia.com/TERM/D/digital\\_divide.html](http://www.webopedia.com/TERM/D/digital_divide.html)

For many nations the issue of the digital divide remains very much topical and a great challenge. Existing literature has pointed to economic and non-economic factors to explaining the continued existence for and resolving the digital divide issue. Many studies have cited local telephony and computer ownership as specific factors that influence internet access (Hawkins, 2005). Some studies have further cited a democratic government as being important to facilitating the spreading of internet use and thus broadband access.

Hawkins and Hawkins (2003)<sup>11</sup> in their research found, intuitively, internet use to be strongly associated with economic development or the wealth of the country, and telecommunications infrastructure. Interestingly, they further found that instituting a flat-rate dialing scheme to be more favorable to internet access. Additionally, non-economical factors such as social and cultural norms are serious determinants to widespread internet use. Other works have pointed to proper network infrastructure along with effective competition and continued liberalization of infrastructure, network services and applications to be crucial in reducing the digital divide and increase the general use of internet. Further, proper market conditions, competitive safeguards also play vital roles in this regard.

Chinn and Fairlie (2004) showed that income and technological infrastructure are two factors that profoundly affect the level of internet use. Additionally, Chinn and Fairly in their work concluded that pricing of telecommunications access does not statistically affect internet use. It is somewhat contrary to the view of Hawkins and Hawkins (2003). Additionally and very importantly, other studies including those completed by ITU suggest that growth in the use of internet (high speed) is dependent on the availability of such service at affordable prices. It is only recently that the penetration of internet use have significantly increase as a result of increased competition which leads to lowered prices, examples include the Asian, European and North American Experiences. Chinn and Fairlie however believe that pricing policies are important. The work of Chinn and Fairlie (2004) pointed out that regulatory quality is of utmost importance in ultimately determining the level of internet use. Interestingly, Chinn and Farilie (2004) concluded that lower education is surprising of a lower effect on PC and internet use than differences in regulatory efficiency.

Growth theory and growth models have major roles for ICT infrastructure and services and human capital. As technology is adopted, it builds human capital and increases total factor productivity and thus boost economic growth.

For Jamaica, presumably a lot of the above arguments might hold. The government, through national e-Government policies, Universal service obligation issues and so forth will play critical roles in reducing the digital divide. Additionally, the improvement and upgrading of networks along with the acquisition of additional hardware will certainly play further vital roles. Additionally, one expect the human capital development, the

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<sup>11</sup> Hawkins and Hawkins researched internet development across 19 Latin American countries between 1990 and 2001, using cross-sectional time series analysis (Hawkins, 2005)

culture, income levels and the regulatory institute to play vital roles in promoting PC access and increase the use of the internet (broadband).

The factors that contribute critically to broadband development are well documented. As such, the future of broadband access in Jamaica will be critically assessed on these fronts. The rest of the paper will critically look at the prospect and future of broadband in Jamaica. This will be done by firstly looking on the factors that will drive broadband demand locally and the factors that will possibly constraint its deployment. Additionally, the paper will look on how the government fits into the entire equation by looking at the Government of Jamaica's (GOJ's) ICT policy. In closing, there is a look at the imminent challenges of broadband deployment for the regulatory framework<sup>12</sup>. In the absence of any real comprehensive econometric study that measures the precise extent to which factors determine computer ownership and internet use, a number of economic, demographic and policy factors are presumed to be major determinants.

#### **1.4 The Legal Framework and Regulatory Framework**

The telecommunications sector in Jamaica is principally regulated by the independent regulator the Office of Utilities Regulation (OUR under the Office of Utilities Act and the enabling instrument the Telecommunications Act, 2000. Additionally, terms and conditions of the respective operators' license(s) may provide for further regulation. The OUR<sup>13</sup> under the Office of Utilities Regulation Act, in Section 2 (e) is mandated

*"... to perform such other functions as may be conferred on it by any enabling instrument."*

Further under Section 4 (b) of the Office of Utilities Act the OUR has the authority

*"... to determine in accordance with the provisions of this Act and any enabling instrument, the rates or fares which may be charged in respect of the utility service,"*

The enabling instrument, the Telecommunications Act 2000, charges the OUR with the following responsibilities as specified in Section 4 to:

*"...regulate specified services and facilities.*

*Promote competition among service providers*

*Determine whether a specific service is a voice service for the purpose of this act..."*

In addition, under Section 71 of the Telecommunications Act, the OUR has the ability to make rules to ensure its proper and effective functioning. Section 71 (a) reads

*"...The Office [the OUR] may make rules subject to affirmative resolution prescribing any matter require by this Act to be prescribed by such rules or any matter that it considers necessary or desirable for the effective performance of its functions under this Act".*

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<sup>12</sup> The OUR is responsible for the regulation of electricity, telecommunications, water, sewage and aspects of public transportation and started operation in 1997.

<sup>13</sup> Established by the Office of Utilities Regulation Act 1995 and made a body corporate under the Act.



In addition to the OUR, there are two other regulatory agencies responsible for regulation in the communications sector in Jamaica. They are the Broadcasting Commission and the Spectrum Management Authority (SMA). The Broadcasting Commission is responsible for regulation in the electronic media, broadcast radio and television, as well as subscriber television. The SMA was established by the Telecommunications Act, 2000 and is responsible for the general regulation of the national spectrum on GOJ's behalf. This includes the granting, revocation and monitoring of spectrum licenses. There is also a body responsible for dealing with matters of competitive significance. This body is the Fair Trading Commission (FTC) and was established by the Fair Competition Act.

## **1.5 Background**

Jamaica is an English speaking Caribbean island, which is a member of the Commonwealth group of countries. For many years, Cable and Wireless Jamaica Limited (C&WJ) was the sole telecommunications service provider; Ownership of the Telephone of Jamaica Telephone Company (JTC) was transferred to C&WJ in 1989. C&WJ, previous to the liberalization of the telecommunications sector, held monopoly rights in the provision of telecommunications services locally. The GOJ then decided to liberalize the local telecommunications sector starting in the year 2000, done on a three-phase basis with each phase lasting 18 months. Additionally, in the liberalization process the local telecommunications industry was to be regulated under the legal instrument, Telecommunications Act 2000. Prior to the liberalization of the local telecommunications sector an independent multi-sector regulatory agency was established with the name Office of Utilities Regulation.

The first phase of the liberalization process witnessed the granting of Mobile, Reseller (data, internet and international voice), Carrier and Free Trade Zone Service licenses. It was during this period Digicel Jamaica Limited, (Mossel Jamaica Limited) bought their licenses for spectrum usage and started mobile operation in Jamaica.

In phase two, which commenced on September 1, 2001, domestic carrier and service provider, internet and cable operator licenses were granted.

Phase three signaled the full liberalization of the local telecommunications market and this phase began on March 1 of 2003. This phase was marked by the issuing of two submarine cable licenses. This will increase Jamaica's capacity to the external world and reduce the incidence of bottlenecks.

Since the liberalization of the local telecommunications market, over 300 licenses have been issued to over 100 companies.

## **1.6 The Current State of Competition in the Local Telecommunications' Markets**

The Jamaica telecommunications market is dominated by the incumbent operator C&WJ, Digicel and Oceanic Digital Jamaica Limited in specific market areas. Competition in the mobile services market is very strong as there are at least two very close competitors.

The fixed line market on the other hand is still dominated by the incumbent C&WJ, which despite other developments remains the only provider of fixed line telephony. Other market areas such as data and leased line services' markets still remain largely within the realms of C&WJ even though competition to some extent is somewhat emerging in the form of Merit Communications Ltd.

A market area of tremendous importance and value to other market areas is the international fibre optic cable market or the market for the provision of international fibre optic networks (the international backbone) is still monopolized by C&WJ whose pricing regimes have made it difficult for other others to enter the market for some retail services (such as internet access) and for others presently in the internet access market to no be able to effectively compete with C&WJ. In addition to the pricing regimes, the limited capacity of the fibre optic cable (about 1 Gbps) have lead to a shortage of available international bandwidth which has resulted in the stifling of effective competition and development in other market segments such as the internet (broadband) access market. However, with the awarding of the two additional submarine cable license to Fibralink Jamaica Limited and Trans-Caribbean Cable Company Ltd (TCCC Ltd) bandwidth will significantly increase as both license holders has pledged to bring a combined bandwidth capacity of 20 Gbps into the island initially with the ability to increase capacity as demand increases.

However, notwithstanding the above, a look at the present market for internet access is considered below. The ensuing analysis will provide an indication of where the market is at, the room available for growth in the broadband access market and what can reasonable result for broadband access as a result of a combination of strategic developments.

The SMA conducted a research on the Internet Service Provider industry in Jamaica<sup>14</sup>. This report provided an indication of the state of internet access as it pretty much exist in Jamaica and the state of the local ISP industry. The report noted that the ISP environment is in a fragile state, as competition is severely threatened by the pricing policies of the incumbent operator, Cable and Wireless Jamaica Limited (C&WJ). The report has noted that the local market is stagnant as the overall market has not grown. The report however made the following recommendations to stimulate growth in the industry. They are as follows:

1. Putting competitive safeguards in place.
2. Providing access to low cost computers.
3. Promoting the use of internet as major research tool in school.
4. Accelerate the government's e-Government initiatives.
5. Mandate the regulators to be more proactive in establishing guidelines and benchmarks for the industry.

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<sup>14</sup> The SMA research utilizes the report of May 2003 done by Market Research Limited for Jampro.

The report further noted that currently C&WJ has approximately 30,000 subscribers which represent approximately 50% of the internet (dial-up market). It appears though that the dial-up market is in an inevitable demise as C&WJ is providing ADSL broadband services at competitive prices to the dial-up prices. Additionally, C&WJ has made upgrades to its network and thus may be in a better position to meet the likely demand for broadband access in some areas. It is expected that a number of dial-up customers will switch over to ADSL service.

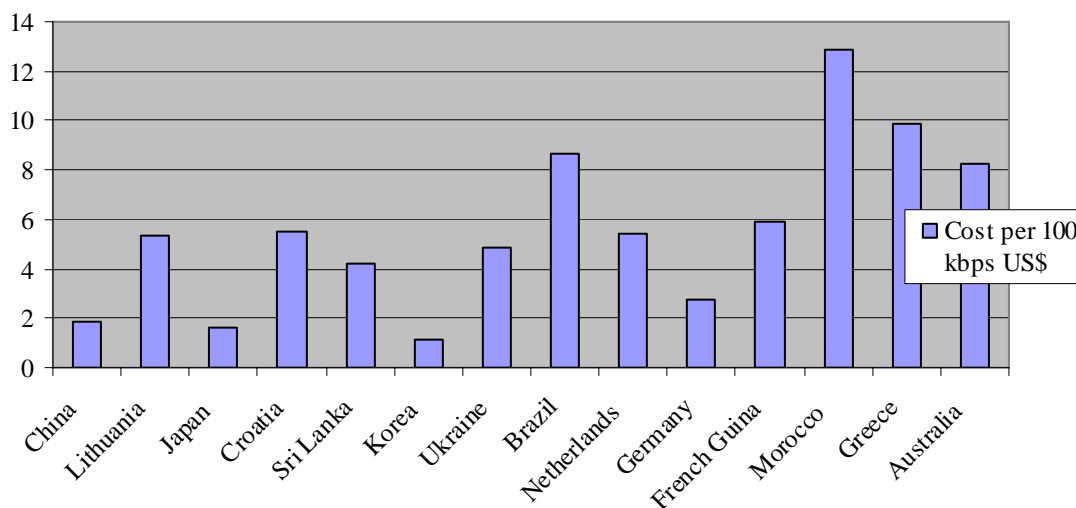
## 2. The Demand Side

The focus of this section of the paper is on the factors that will presumably drive the demand and uptake of broadband within the Jamaican society. Of tremendous implication for demand is affordability of a service or product. This section takes a comparative look at broadband access prices in Jamaica with the rest of the world. In addition, the prospects for prices changes and its implication on future broadband access are explored. Further in the section other factors that will drive broadband uptake are explored.

Presently, C&WJ, which is the incumbent operator and the main provider of internet access is offering the service at a cost of US\$29.95 (for 128 kbps) and US\$49.95 for 512 kbps<sup>15</sup>. Before July 7, 2005 C&WJ was offering 128 kbps for US\$45.

How do these prices match up to the price of broadband elsewhere in the world? Figure 2 below show the cost of broadband access per 100 kbps in selected countries, in July 2004 as reported by ITU (ITU, 2004).

**Fig. 2. Cost for broadband access per 100 kbps**



Source: ITU

<sup>15</sup> See [http://home.cwjamaica.com/content/products\\_services/business/adsl/index.asp](http://home.cwjamaica.com/content/products_services/business/adsl/index.asp). These rates were on 18/8/2005

As Figure 3 above illustrates the cost of broadband in Jamaica is very high vis-à-vis many other countries in the world. In July of 2004, 100 kbps of broadband access in Jamaica was being offered for above US\$30. This is certainly way above the access prices shown above. The cost for Jamaica has been reduced since as noted above, but the cost still remains high relative to the prices above. Further, one anticipates that most of the prices reported above must have been reduced substantially since also.

Recent data shows that there still exist a huge disparity in the cost of broadband access in Jamaica and what can be obtained elsewhere in the world. In the UK according to Ofcom, 8mbits/s service can be obtained for as low as £29.99 (or approximately US\$53.78)/ monthly in some areas. British Telecoms entry level product in May 2005 offered 1 Mbits/s for just £17.99 (approximately US\$32.26)/ monthly.

Things are even cheaper in the US. Some cable operators are now selling broadband for as low as US\$14.95 per month. Verizon Wireless for example offers 768kps for US\$14.95 and 3 Mbits/s for US\$37.95<sup>16</sup>. In France rates have been falling and 512 kps can be obtained for as low as US\$18. Despite these relatively low rates however, Japan has probably the cheapest broadband market<sup>17</sup> and in Korea and China the broadband market remains very cheap also.

The above prices clearly show that local broadband access prices are very high relative to prices elsewhere. Even though it may not be entirely likely to offer the service for similar prices as in the UK, USA, Korea, even say the Japan or some of the other countries used in the analysis above, the truth is there still exist a huge disparity in the prices. This shows that there is enormous room for reduction in local broadband access prices.

Locally, C&WJ's ADSL prices are very competitive in the local internet market. These prices have suddenly start creating new challenges for dial-up internet providers who may suddenly find consumers switching over to broadband. Dial-up internet service in Jamaica constitutes two prices, a price for access and a metered per minute charge for the use of the line. This sort of tariff structure along with the added inconvenience of not being able to receive calls whilst using the line for dial-up internet use has further made the broadband access far more attractive. On average the access charge for dial-up service is about US\$17 (approximately J\$1,000). This in itself makes the service rather unattractive vis-à-vis broadband access.

As noted earlier, future demand for broadband access will be driven by its affordability and so economical efficient prices can only result from sustainable effective competition. Experiences show that increased effective and sustained competition will be sufficient to deliver low prices to end users. In light of the Jamaican context where competition in the internet (and broadband) access market is notably absent and given the above comparisons, there is enormous room for price reductions with increased competition.

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<sup>16</sup> These are according to Verizon Wireless Website, September 20, 2005

<sup>17</sup> See *International Broadband Market Comparisons Update December 2004*

Against this background what are the prospects for increased and sustainable effective competition in the local ISP market?

Presently, because of infrastructure shortage and other things competition is compromised. C&WJ owns most of the facilities required and necessary to provide access in the local ISP market. Most players in the local ISP industry are resellers, reselling C&WJ's services. These providers basically rent capacity on C&WJ's existing infrastructure. With the absence of another operational fixed line operator with an independent infrastructure, competition is effectively compromised as even with available international bandwidth connectivity these providers won't be able to effectively provide any meaningful competition for C&WJ and so will not be able to exert any pressure on C&WJ for price reductions for broadband access.

Gotel, another local company, has a fixed wireless network but has been unable to provide any form of service. Effectively, this means that C&WJ has no competition in the local fixed-line market. Further, it is widely known that true and effective competition only comes in the form of facility based competition. This point goes to show that it will be particularly difficult for resellers to provide any form of effective competition in the local broadband market.

The only way to have and maintain effective competition is to have facility based competition. This can only be achieved through improved wireless local loop access, or for local cable operators providing the service, i.e. competition from other technologies and platform in the provision of telecommunication services including broadband access. Cable operators i.e. providers of subscriber television in this technological age role become of increasing importance as traditional coaxial cable network can be upgraded to provide telecommunication services previously only provided by traditional legacy networks, as is the case in other countries. In the United States for example, cable operators are the main provider of broadband access leading the incumbent local telcos. Cable modem accounts for 75% of the broadband market served whilst DSL serves 25% of the market as at December 2003 in the United States (Frieden, 2005). This is clearly as a direct result of access, as well as good marketing and innovation on the part of cable operators. Cable television is very common and widespread<sup>18</sup> in the United States of America and as such the cable operators through technological development and "last mile" access can offer internet access (broadband). The cable operators can therefore play a vital role in Jamaica's broadband access market development and provide for great competition as subscriber television is very widespread in Jamaica. However this issue is expounded on later in the paper.

The core infrastructure link is the local loop. The local loop or commonly being referred to as the "last mile", is also, the last remaining segment of the customer access subject to competition and regulatory debates in many parts of the world. One of the regulatory options is to unbundled the local loop thereby providing new entrants access to the last mile with the ultimate objective being increased choice for customers through

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<sup>18</sup> According to J. P. Morgan, 73% of households in the United States of America have modem service available.

competition. In Jamaica the local loop is yet to be unbundled and as such the “last mile” access remains topical and pertinent for broadband access provision.

In addition, this will provide for greater access to the “last mile”, which has been the major complaint of many local ISP. This, they argue, will provide for greater business for them and the ability to operate at a lower cost and therefore provide the service at a lower cost. While unbundling the local loop may improve competition, it also reduces the incentive for infrastructure investment. Garcia-Murillo and Gabel (2003) found that network unbundling is not significant in promoting competition and thus determining broadband access across countries.

It is largely believed that once the two submarine optic cables are built then a large part of the problems will be solved. This belief is not at all superfluous but is pretty logical. Increase bandwidth will reduce its cost, so operational cost for ISP will fall and so the end product will fall. Additionally, the local ISP market will be revolutionized in the sense a many ISP’s will be encouraged to enter the market as bandwidth cost will fall tremendous. Other implications include the reduction in international long distance costs through web-based networking options. They are bounded by conditions of their respective licenses to start operation by the ending of year 2006.

With increased competition and so forth consumers should experience a commensurate increase in innovation and the reduction of price for broadband access as is experience in other societies. According to Ofcom<sup>19</sup>, improving technology and increasing competition are resulting in lower prices and extended choices to consumers.

## **2.1 Competitive Safeguards**

Further to the regulatory regime the following section outlines specific competitive safeguards that would need to be implemented to support competition and support broadband access investment in Jamaica.

There have been many complaints to the OUR of alleged anti-competitive conduct on the part of C&WJ. Many have noted that the conducts threaten profoundly their ability to remain viable in the market. However, the OUR is unable to addressed majority of these issues, due to the present regulatory framework in which it operates. The OUR is however in the process of issuing a competitive safeguards document. The Consultative Document will culminate in a Notice of Proposed Rule Making (NPRM) document which after receiving affirmative resolution in Parliament will become binding rules to address anticompetitive practices on all players in the market. It then means that aggrieved parties can use this as a tool in seeking redress in a court of law.

The OUR is further handicapped in addressing anticompetitive issues because the Telecommunications Act 2000 in Section 5 (b) clearly states that any matter that

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<sup>19</sup> See <http://www.ofcom.org.uk/research/cm/overview05/keycomms/>

*“...is of substantial competitive significance ...and falls within the functions of the Fair Trading Commission<sup>20</sup> under the Fair Trading Act, the Office [the OUR] shall refer the matter to the Fair Trading Commission”.*

However the FTC is presently unable to address or make a ruling on any matter of competitive significance. This is attributed to a judgment made by the Supreme Court that the FTC made a breach of natural justice in the case of Jamaica Stock Exchange vs Fair Trading Commission. This situation has only meant that small operators have little or no protection, as they may not be able to fund their defense in the court of law. In order for broadband investment in Jamaica to be sufficient it is important that the OUR jointly address their respective roles and mandates in order that regulatory and competitive practices can be properly implemented for the success of the broadband market.

What are the prospects for the future? The Fair Competition Act is currently undergoing amendment. This should return authority to the FTC in dealing with matters of competitive significance. Notwithstanding the above, the OUR challenges are compounded by the fact that the Telecommunications Act 2000, speaks specifically to dominant voice carriers. It therefore means that the competitive safeguards may only be applicable if the abuses are from a dominant carrier. The Telecommunications Act 2000 is currently undergoing review and amendment and presumably this will be addressed. The Act is also being designed to provide for relevance and to address issues of convergence.

## **2.2 Potential Market Size**

Noted earlier in the SMA Report is that C&WJ currently has approximately 30,000 subscribers, representing 50% of the dial-up market and approximately 9,000 subscribers which represents 100% of the broadband user market. This translates to a very small percentage of the total market available and served. As a caveat, since the SMA Report new high speed internet providers have entered the market but C&WJ is still expected to control majority of this high speed (broadband) access market.

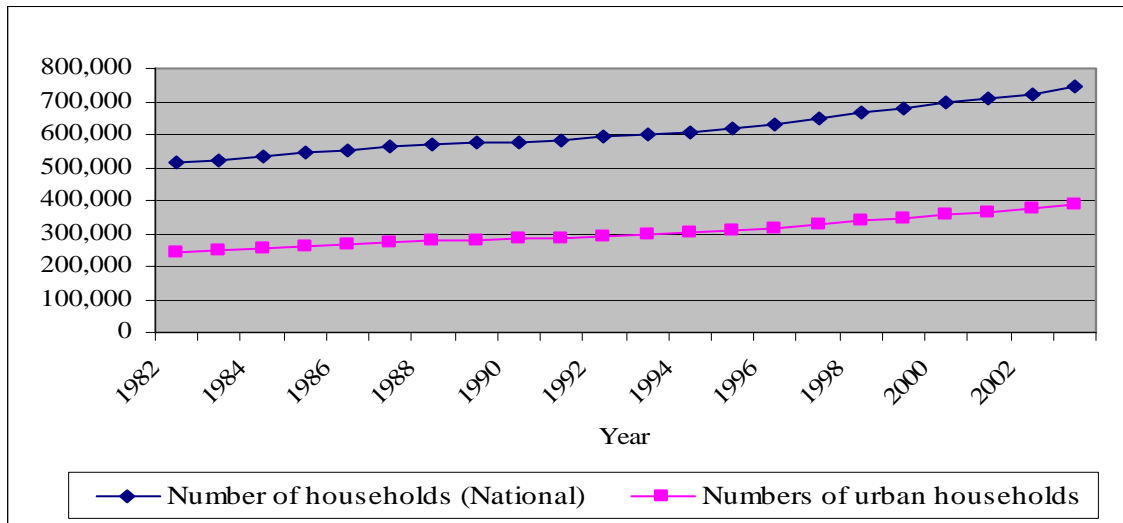
We also expect that with recent falling prices for broadband access, dial-up internet service will lose significant market share to broadband service. There appears to be, as describe above, an enormous opportunity for growth in the local market for broadband access.

Households numbered a little above 700,000 in 2003 and the number continues to grow at a steady pace annually. Of the household number almost 400,000 were in urban areas, and also exhibit a steady growth pattern, see diagram below. In addition, there are over 60,000 businesses and public institutions spread across the island. Based on these numbers, 100% market share could extend well over 800,000 customers/ subscribers.

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<sup>20</sup> The Fair Trading Commission is the official local authority responsible addressing issues of competitive significance.

**Fig. 3. Number of households in Jamaica 1982 - 2003**



Source: Planning Institute of Jamaica (PIOJ)

However if the market analysis is restricted to only urban households and businesses then based on conservative estimates the real total, the potential subscribers could still extend to the 500,000 subscriber mark or higher. This restriction is based on economic and other considerations such as income levels, population density, human capital, inter alia. Based on current subscriber numbers, less than 10% of a potential number is served. There is therefore enormous room for growth in subscriber numbers.

Once the conditions are right and the service is marketed properly, the ISP's could realize significant increases in subscriber numbers. It is not wise to undermine or underestimate the Jamaican public. Mobile services should serve as a perfect example. Mobile numbers have increased exponentially over the years. Mobile subscriber numbers increased from approximately 1.4 million in 2003 to over 2 million in 2004, for example. This is a remarkable increase, it signals that the culture exist or is developing that will demand services that broadband will provide. The foundation has been laid and it is just for the ISP's to expedite and build on the foundation.

Data by the World Bank indicate that internet use per 1,000 inhabitants have grown in Jamaica. Internet use per 1,000 inhabitants increased from 23.5 in 1999 to 228.4 in 2002. This is a considerable increase and this level of increase is expected to continue. This optimism is further fuelled by the changing culture, one which is receptive of technological advancements. In addition, government policies will continue to expose more persons to the internet through various initiatives. These initiatives will be expounded on further in the document.



## 2.3 Income Levels

Statistics compiled by the Leichtman Research Group show that broadband penetration is strongly correlated with household income<sup>21</sup>. The relationship is positive with higher penetration rates associated with higher income levels. This was for the American society but the relationship presumably extends to the rest of the world.

**Table 1**  
**Strong relation between household income and broadband penetration by region in the United States**

	Rocky Mountain	Southeast	Plains	Great lakes	Southwest
Penetration	17.1%	18.2%	18.4%	18.4%	19.6%
Income	US\$29,974	US\$28,554	US\$31,044	US\$30,789	US\$28,439
	Mideast	Far West	New England	US Overall	
Income	25.1%	27.2%	27.8%	21.3%	
Penetration	US\$36,243	US\$33,191	US\$38,171	US\$31,632	

Source: Leichtman Research Group (2004 data)

Data from the International Telecommunications Union (ITU) show further that from a global vantage point the more affluent national economies and regions have the highest broadband penetration rates<sup>22</sup>. For example, Korea, Hong Kong (China), the Netherlands, Denmark and Canada most are leading the way, having the highest broadband penetration rates in the world (ITU, 2005).

The above simply highlight the strong connection between income levels (household) and broadband penetration. Due to the huge disparity between Jamaica's per capital income (US\$4,000 estimated) and any of the above mentioned economies, it appears on the face of it that broadband penetration may be a great challenge and so might not encourage prospective suppliers of broadband in Jamaica. However, income is not the sole driver of broadband demand, and its penetration, as aforementioned. It therefore means that the disparity in itself ought not to be sufficient to discourage and/or deter broadband demand and access in Jamaica. Many are of the view that the digital divide will close eventually, Bruce Leichtman is among those that share this view. The divide will close because income will not be the only deciding factor of broadband demand and penetration. Further, Frieden (2005) argues that economic policies do not completely explain why some nations offer faster better cheaper and more convenient broadband services while other nations do not. To compound the just mentioned view the United States ranks sixteenth in global broadband penetration rates.

## 2.4 Government/ ICT Policy

Where do GOJ fits into this puzzle? There is no debate that GOJ indeed has a vital role to play on both the demand and supply for broadband. Developed and developing

<sup>21</sup> The information was taken from the <http://www.broadband-pbimedia.com/cfaxdb/archives/databriefs071204.htm>

<sup>22</sup> Broadband penetration is measured by the number of subscribers per 100 inhabitants.

nations alike are cognizant of the improvements in standard of living through increased productivity that ICT provides (Frieden, 2005) Many governments have asserted themselves and start playing major roles in their economies in enhancing broadband access. In Korea and France, for example, the governments made major intervention in the telecommunications industry to ensure the deployment of broadband. Other economies such as Germany, Italy and United Kingdom, the governments have played reasonable roles.

GOJ has made it clear that it intends to create a society that is network world ready. This with the intention of increasing competitiveness, diversify exports and expand productive employment. As such, GOJ has undertaken various projects toward this end. One such project is the Government of Jamaica/ Inter-American Development Bank Information and Communications Technology Project<sup>23</sup> signed on Wednesday, June 25, 2003. The project is worth US\$23-million.

Components of the project are as follows:

*“...Community Outreach – Provision of internet access to marginalized communities to help citizens benefit from available online opportunities such as access to web-enabled Government services, employment exchange, market information and distance learning opportunities, and to provide a means for conducting transactions on the internet (e-Commerce); and...Provision of training to enhance the pool of available human capital in ICT...”*

GOJ has recently launched a Universal Service Fund Company to manage the Universal Service Fund. The Fund will be used to implement a national e-learning project. The Fund, pursuant to the Telecommunications Act 2000, is to subsidized access to telecommunication services, especially internet access to schools and other public institutions such as libraries and post offices.

The government’s efforts aforementioned are geared in building the capacity of human capital and this will decisively drive the demand for computer ownership and internet use.

The government has also recently removed the consumption tax that was leveled on personal computer (PC). This action should increase the demand for PCs as personal computer prices should fall. However the GOJ is encouraged to do much more to make PCs more affordable along with cable modems. This has serious implications for the demand for broadband. A personal computer penetration rate of 5% is certainly not good. This rate can be improved as data from the ITU show that regional penetration rates are as follows, Latin America and Caribbean - 5.9%, North America – 61.1% and

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<sup>23</sup> See

[http://www.mct.gov.jm/Ministry%20Papers%202005/Ministry%20Paper%20for%20IDB%20ICT%20Project%20May%202005%20RB%20\\_Printed....pdf](http://www.mct.gov.jm/Ministry%20Papers%202005/Ministry%20Paper%20for%20IDB%20ICT%20Project%20May%202005%20RB%20_Printed....pdf)

Europe and Central Asia -18.1%. It is therefore quite likely that Jamaica's penetration rates could be increased given the fact that the above rates were from the year 2001<sup>24</sup>.

To reiterate, there is a very strong positive relationship between personal computers and internet use. Therefore an increase in personal computers will increase the use of the internet. The seeming effort by the government to increase the personal computer penetration rate will certainly increase internet use, and the demand for broadband access. Interesting, ITU<sup>25</sup> reports that in 2004 Jamaica had had 1,067,000 internet users which results in a penetration rate of 39.87 %. This is the highest rate in Caribbean it compares well with rates of 62.28% in the United States, 60.39% in England, 54.15% in Korea. This speaks largely to the efforts of GOJ and this has serious implications for the future demand for broadband access in Jamaica.

The 2001 Census carried out in Jamaica showed that approximately 88,000 households of a total of 748,329 households had a computer. This approximates to a 12% proportion. This statistic is pretty encouraging. It shows that a fair percentage of households are exposed to its use and so will be encouraged to obtain internet. Additionally, the statistic shows that there is room for growth in computer ownership which means greater usage of the internet (broadband). Even though there is no time-series data to look at for Jamaica one expects the growth of personal computer ownership locally to be healthy, this is in keeping with the global trend and in light of the news that lap top computers will be made available to school children for at very reduced cost of US\$100 in Jamaica. The global community has experienced a steady growth in computer ownership as there were 2.5 personal computers per 100 people in 1990 and it climbed to 9 per 100 people in 2001 (Chinn and Fairlie, 2004).

### **3. The Supply Side**

While demand side stimulation is very good, supply side stimulation is of equal importance to broadband deployment. It is expected that private carriers/ entities will lead the way in providing broadband access given the incentives to do so. However governments at the national and local level can play vital roles in ensuring the deployment of broadband access.

The GOJ has made its commitment to increase broadband access. This is done to support growth in wireless based communications through GOJ's move to unlicense certain segments of the spectrum to make it freely available. Examples of the wireless based technology include Wifi and Wimax. This was mentioned by the Honorable Minister in charge of ICT in his contribution to the 2005/06 Sectoral Debate in the House of Representatives on June 1, 2005<sup>26</sup>.

The entrance of the two submarine fibre-optic cable licenses is set to breathe new life in the local ISP industry. This will enter the wholesale market and thus will provide

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<sup>24</sup> Taken from the work by Chinn and Farlie

<sup>25</sup> See [http://www.itu.int/ITU-D/ict/statistics/at\\_glance/Internet04.pdf](http://www.itu.int/ITU-D/ict/statistics/at_glance/Internet04.pdf)

<sup>26</sup> See [http://www.mct.gov.jm/internet\\_access.htm](http://www.mct.gov.jm/internet_access.htm)

network elements to many existing providers who are presently purchasing bandwidth from C&WJ. It is argued that C&WJ pricing regime does not allow them to provide any effective competition in broadband provision, as such, the situation has failed to exert any downward pressure on C&WJ prices for broadband access. However, the imminent competition from the submarine fibre optic license holders have somewhat forced C&WJ to reduce its price for broadband access in recent months and is embarking on a drive to reach 50,000 customers by March of 2006. This will foster and promote competition within the local ISP sector.

One point of concern though, is the constant substitution of fixed line for cellular lines. This can and will affect DSL role out without a doubt and other access issues although mobile service provider Oceanic Digital Jamaica Limited employ Code Division Multiple Access (CDMA) technology which can provide broadband access with minimal upgrade, but is yet to address fully issues of all island coverage. C&WJ has however begun a promotional campaign to encourage maintaining and reclaiming of fixed lines. However, the gap could be filled by other means of broadband provision. It is at this juncture the cable operators will be of vital importance to the local ISP market.

Jamaica, despite lacking in certain infrastructure has a very high teledensity rate, which is approximately 80% if the total subscriber based (fixed line and mobile) is considered. This reality potentially supports the hypothesis that the market has a higher propensity to obtain broadband access.

The issue of broadband access for Jamaica has become easier due to cable operators providing internet service using cable modem. Cable systems extend all over the island and so it can address the access issue. Cable television is very popular among Jamaicans and many persons will demand that type of service. Additionally, given the right pricing incentives customers may be attracted to a bundled service package that could include cable television, broadband access, internet access and potentially Internet Protocol (IP) based telephone service. However this is dependent on some of the factors mentioned earlier such as more open competition through regulatory support, incentives to the market penetration of PC's and the provision of broadband type networks by facility based carriers (fixed wired line, fixed wireless or cable networks). In addition the pricing of these network elements would be a crucial factor to support the increase provisioning of the access as well as stimulating demand for broadband type services among the end users.

Information from the Broadcasting Commission in Jamaica show that there are 52 cable operators presently operating in Jamaica. The Commission notes that there are 241 zones where two licenses are awarded for each zone. Some zones have either one or two cable operators providing subscriber television services. Some operators have started providing internet service or some other form of data related services.

To date, at least three cable operators are known to be providing internet access or high speed internet access. As a matter of fact, one company, Jamaica Amalgamated Cable Systems (JACS) is providing internet access at speeds of 128 kbps for approximately

US\$30.00. This is on par with what C&WJ is providing. JACS has certainly set the precedent for many others to follow and it is expected that many other cable provider will look to diversify their products and services base thus diversifying the revenue stream by providing internet access (broadband) and other IP typed services.

There is much room for expansion in cable service provision given the availability of zones. Notwithstanding the above, the problem of fragmentation of the industry makes it difficult to develop economies of scale within the industry. There is talk however of the possibility of granting an all island licence. The number of cable operators still augurs well for the ability to extend services to customers if demanded and to solve a large portion of the access problem. Further, it is expected that more operators will enter the market as the island's data capacity increases.

#### **4. Regulatory challenges of broadband service**

Broadband development is not without its challenges, indeed it is expected to provide serious challenges for regulation. In fact, the challenges are already being experienced by many regulatory agencies in other jurisdictions. The OUR is quite aware of the challenges and therefore is trying to position itself to deal with the challenges. One such challenge is working with an enabling instrument that does not address the issue of convergence. The Telecommunications Act in its present language does not speak to convergence.

Convergence is a notion that has garnered much attention and is simply the outcome of continued technological development. Additionally, it has become an acute regulatory issue because services such as voice, video and others are converged and provided by the same operator to end users with broadband access. Therefore convergence is supported by industries in telecommunications, broadcasting and information technology. Convergence is led by new platforms such as the Next Generation Networks (NGN) and Third-generation wireless technologies. One very common NGN is VoIP. Another significant contributing factor to the issue of regulation is the role of content, a major revenue opportunity in the convergence era.

Convergence has become such an issue because converged services might have been regulated by separate agencies before and as such there may be a need to merge regulatory agencies and/or the regulatory framework modified to reflect changes in technology. Therefore, regulated and regulatory regimes have also mapped convergence in terms of potentially consolidating and merging the various separate regulatory bodies that govern the various individual sectors (telecommunications, broadcasting and spectrum management)

The challenges that convergence poses for the regulator are real and so its regulation must be effectively managed. One such challenge will be the effective promotion and fostering of competition. The OUR will definitely have to facilitate the development of the market to ensure that competition can be effectively sustained. This should produce affordable prices and variety of products and service offers. In ensuring proper and

effective development of the market, issues of open access, interconnection and interoperability will have to be necessary.

The OUR will therefore be challenged to provide comprehensive rules (competitive safeguard rules) to promote and foster competition. Effective competition will reduce the need for regulatory interventions and therefore this must be the best approach to regulating NGN. There must therefore be a notable absence of anti-competitive behavior in the various markets. The OUR must find a way, given the present regulatory infrastructure, to ensure access, whilst promoting facility based competition.

Further, for effective regulation the OUR or the regulator authority under convergence market environment will certainly need to reduce considerably the asymmetry of information. Accordingly, proper rules and precedents must be set to allow for timely and proper information flow between the regulator and the regulated.

Based on the information above outlined and given the emergence of the convergence era the present regulatory framework is faced with significant challenges. The OUR recognizes that the GOJ and the Minister of ICT are addressing this issue in order to look at alternative regulatory regimes most appropriate to support the ICT policy and the global trends and directions in terms of the regulatory regime.

In some countries<sup>27</sup>, telecommunications and broadcasting regulatory authorities merge. In others, one legislation which is comprehensive on communication services (includes all the previously mentioned industries) is used by different regulatory institute in the various industries<sup>28</sup>.

One other regulatory challenge has to do with regulating quality of service. Without doubt, competition will provide for lower prices but quality must not be compromised in achieving that end. Certainly, minimum standards of service have to be developed. Additionally, the regulator will have to remain vigilant and proactive in dealing with a lot of these issues.

#### **4.1 VoIP**

VoIP is one of the most talked about telecommunication services or applications derived from broadband access. It is posing numerous regulatory challenges. One such challenge is whether to regulate VoIP as a voice service or data service. This determination is of particular importance to the OUR as the Telecommunications Act considers VoIP to be a voice service. This in itself has posed challenges for the OUR. The Telecommunications Act under section 2 notes that:

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<sup>27</sup> In England for example, the previous Office Telecommunications (OfTel) responsible for telecommunication regulation, however its duties were assumed by the Office of Communications (Ofcom) which is responsible for national communications regulation.

<sup>28</sup> This is the case in Hong Kong where the Telecommunications Ordinance Act is used an umbrella Act for the telecommunication and broadcasting industries. The Telecommunications Authority (TA) and the Broadcasting Authority (BA) uses the Act for its respective regulation.

*“voice service means- a service determined by the Office [the OUR] to be a voice service within the provisions of section 52, and includes services referred to as voice over the internet and voice over IP”.*

VoIP is poised to revolutionize voice telephony as it exists today. As such, many telecommunications company are bracing themselves to expedite the opportunities that VoIP technology will provide. VoIP provides a more cost effective means to traditional wireline telephony services. At a very base level of a technology platform, VoIP rides the Internet at no additional cost to provide very inexpensive long distance service. At the other end of the technology infrastructure VoIP is a derivative of a single converged infrastructure.

The very technical design of VoIP allows for this advantage as the voice signal is sent as a “packet” using the Internet Protocol (IP), insensitive to geography and distance and transported on a number of legacy networks that support the protocol. Therefore, VoIP has become a defacto long distance and international service at an extremely affordable price. In some countries where there is no interconnection and hence any “legalized” competitors for incoming international termination or outgoing international origination, it has resulted in serious loss in foreign exchange inflows – a revenue stream received through settlement rates between and domestic and international carriers.

One of the major regulatory challenges has to do with interconnection. A VoIP type service that interconnects with the regular Public Subscriber Telephone Network (PSTN) will have regulatory obligations. An example of such a VoIP type service is PC-to-phone, voice call. Further, VoIP will have to address issues of universal service obligations. Other regulatory obligations include the provision of minimum quality service at affordable prices, requirements for network integrity, access to emergency numbers and numbering.

Some of the early regulatory regimes that have formally adopted VoIP as a legitimate service have also rendered decisions that have become the subject of much debate and possible government intervention. The recent ruling by the Canadian Radio and Telecommunications Commission (CRTC), in its landmark decision CRTC 2005-28 has deemed VoIP as a voice service and while required the incumbent local exchange carriers to file tariffs, it has exempted the cable companies from having to do so. VoIP, in the case of the cable companies was deemed as being retail Internet Service and exempt from being subject to similar rules.

The ruling is very exhaustive and extensive and provides detailed analysis of a number of alternative positions including some totally opposing viewpoints from the incumbents as well as even regulators. The incumbent telephone companies are challenging the decision by the Regulator. There are compelling reasons for GOJ to at least review the CRTC ruling particularly given the fact that the Telecommunications Act in Jamaica also has ruled VoIP to be a voice service. Also, the potential widespread availability of broadband and cable based voice and potentially VoIP services would necessitate the OUR to address similar issues as was the case for the CRTC (numbering, emergency

services, equal access i.e. for cable companies to allow Third Party Retail service providers access to the cable network). There are numerous other issues related to VoIP for both ILECs and cable companies that will need addressing through a regulatory framework and rulings.

## 4.2 3G

Third Generation technology or 3G technology for short, is an improvement to the commonly used 2G and 2.5G wireless technologies among many mobile/ cellular service providers. 3G systems promise faster communication services including faster communications services, including voice, fax and internet, anytime and anywhere with seamless global roaming<sup>29</sup>. In other words, 3G technology allows for broadband typed services over the mobile phone. The main regulation challenges that are expected to result from this technology should relate to Spectrum management. As is already known spectrum is scarce resource and therefore must be properly managed.

Generally speaking 3G technology takes up additional spectrum and as such will require changes to facilitate this. However there is hope as resolutions at the World Radio Conference (WRC) expanded significantly the spectrum capacity to be used for 3G, by allowing the use of current 2G spectrum blocks for 3G technology and allocating 3G spectrum to an upper limit of 3GHz<sup>30</sup>. The SMA conforms to the standards of the ITU and so it is expected that when operators adopt the 3G technology spectrum will be available to accommodate them. Additionally, Oceanic Digital Jamaica, a local mobile operator, has Code Division Multiple Access (CDMA) spectrum technology for which a wideband version is the dominant interface for 3G technology. Oceanic will require little additional spectrum being CDMA. However C&W and Digicel need additional to move to WCDMA, the envisaged migration path for GSM networks

## 5. Closing Remarks

Based on current subscriber numbers relative to the potential and likely market size, the analysis shows that there remains enormous opportunity for broadband growth in the local telecommunications' industry. The market remains largely unserved because of pricing issues mainly (the local price for broadband services remain very high relative to international prices) and the lack of competition in the local internet access market to extend the access and reduce prices thus making the service affordable. In all likelihood, the price of broadband access presently could be the single greatest deterrent to broadband uptake locally. It is expected that with the entrance of the two submarine cable operators to the local wholesale telecommunications market and infrastructure development that will follow the local ISP market will become highly competitive and thus enormous benefits to consumers in the form of increased access at reduced prices. There are also expected improvements in delivery of service, increased innovation and overall better quality of service.

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<sup>29</sup> See <http://www.itu.int/osg/spu/ni/3G/technology/>

<sup>30</sup> See <http://www.itu.int/osg/spu/ni/3G/technology/>



With the increased efforts of GOJ through the many initiatives it is expected that demand for broadband will be boosted through the building and shaping of the culture and the further enhancing of human potential. Additionally, GOJ initiatives also aim at improving the local ICT infrastructure and thus providing the potential for better access.

The regulatory challenges remain imminent and it's a general consensus that the regulatory framework will need worthwhile modifications and overhaul to properly and effectively meet the challenges and provide for continued promotion and competition in the local telecommunications' industry.

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