

A REVIEW OF THE JAMAICAN TELECOMMUNICATIONS SECTOR

Prepared by

Fair Trading Commission (FTC)

and

Office of Utilities Regulation (OUR)

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LIST OF ACRONYMS

ADSL	Asymmetric Digital Subscriber Line
CDMA	Code Division Multiple Access
CPP	Calling Party Pays
CWJ	Cable and Wireless Jamaica
DSL	Digital Subscriber Line
FCA	Fair Competition Act
FTC	Fair Trading Commission
GDP	Gross Domestic Product
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HHI	Herfindahl Hirschmann Index
HSDPA	High-Speed Downlink Packet Access or High-Speed Downlink Protocol Access
IP	Internet Protocol
ISP	Internet Service Provider
IVSP	International Voice Service Provider
ODJ	Oceanic Digital Jamaica
OECD	Organization for Economic Co-operation and Development
OUR	Office of Utilities Regulation
PBX	Private Branch Exchange
PSTN	Public Switched Telephone Network
SIM	Subscriber Identity Module

TA	Telecommunications Act
TDMA	Time Division Multiple Access
UMTS	Universal Mobile Telecommunications System
VoIP	Voice over Internet Protocol
W-CDMA	Wideband Code Division Multiple Access
Wi-Fi	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access

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EXECUTIVE SUMMARY

Introduction

In response to a Directive from the Minister of Industry, Technology, Energy and Commerce Honorable Phillip Paulwell, the Fair Trading Commission in collaboration with the Office of Utilities Regulation conducted a review of the telecommunications sector. The review assesses how adequate the current regulatory framework has been in achieving the Government's stated objectives. It takes account of the development of the telecommunications sector over the past six years and future market developments which are expected to affect competition in the sector. The scope of this review is wide; and it has considered consumer issues as well as competition issues.

Key Findings

The review sought to answer the following questions:

1. How has the sector performed in the post-liberalization period?
2. How satisfied are consumers with their suppliers and the range of their service offerings?
3. What are the threats to the competitive provisioning of telecommunications services?

The above issues are considered for four important segments within the telecommunications sector; the local fixed voice and access, mobile, Internet and international segments. These segments constitute the majority of the telecommunications industry and trends within them have profound impacts on end-users and the general industry structure.

(I) Post-Liberalization Performance of the Telecommunications Sector

The impact of telecommunications liberalization process was assessed by examining the following variables: the level of investment in the sector; revenues of operators in the sector;

contribution of the sector to economic growth (as measured by GDP); and the characteristics and structure of the chosen market segments (mobile, Internet, fixed, international).

Impact on Revenues, Investment and Economic Growth

The impact assessment has revealed that the liberalization process has had a positive impact on the telecommunications sector with respect to investments and revenues. Data on the sector revealed that revenues for the two largest operators in 2005 were 65% higher than they were in 2001. The available data also indicates that the level of investment in the telecommunications sector has remained buoyant. It is safe to assume that in the first three years of liberalization, investment in the mobile segment was the key driver of telecommunications investment. The upgrade of the incumbent's fixed and mobile networks as well as the deployment of the FibraLink submarine cable and Columbus Communications Jamaica Limited's cable network also contributed to the increase in investment in the telecommunications sector. In the years since liberalization, the sector's contribution to economic growth (as measured by GDP) has shown a steady increase moving from J\$14275.7M in 1999 to J\$28511.3M in 2004.

Impact on the Competitive Profile of the Market Segments

If a quick look analysis of the post-liberalization telecommunications sector as a whole is undertaken, the result of the liberalization process has been successful in terms of outcomes such as increased penetration rates, lower prices and higher levels of investment. Disaggregating the sector analysis reveals however, that the impact of the liberalization process differs across the various market segments, particularly with respect to their competitive dynamics. Competition is strongest in the retail mobile and international segments of the sector. In fact, the mobile operators have emerged as the incumbent's main competitors; these operators compete directly with the incumbent's mobile network and they also provide some degree of inter-modal competition for its fixed network. In addition to price reductions, competition in the retail mobile segment has also resulted in the introduction of several innovative services. The international segment has also registered positive results and it has benefited significantly from the entry of new operators (many of them service-based) who have driven down the rates for international

calls. The incumbent is currently providing VoIP services and new entrants are either currently providing or planning to provide phone to phone VoIP services. The transmission of international calls using VoIP is expected to increase significantly as Internet penetration rates continue to increase and this should result in further reductions in international rates. The Internet segment has also benefited from the liberalization process albeit on a smaller scale than in the international and mobile segments. In addition to an increase in penetration rate, initial set up fees and monthly access fees have decreased. Internet and data services are increasing in relative importance and it is expected that carriers will continue to deploy broadband infrastructure. The take-up rates for broadband services will be dependent on how attractive these services are priced. The data and Internet market should provide further growth opportunities as computer penetration increases and business to business (B2B) transactions and e-commerce applications expand. It is also expected that the new submarine cable networks will trigger further developments in this market segment.

Competition is much less intense in the fixed market segment. CWJ's ownership of the copper local loop gives it significant control over the provision of fixed access retail and wholesale services. Currently, limited competition is provided at the wholesale level by Flow and at the retail level by Flow, CS Telecom, and GOTEL. An analysis of fixed line usage reveals that the volume of calls routed via the PSTN has decreased. This is particularly significant in the case of local calls, and is suggestive of the degree of mobile call substitution. As internet penetration increases and VIOP services become more available, revenues from basic services over the PSTN will continue to decline. Currently, Flow's triple-play menu of services provides the most viable means of eroding the incumbent's share of the fixed access market and increasing fixed penetration rates.

(II) Consumer Feedback

A survey of residential and commercial consumers was conducted to gauge their feedback regarding the telecommunications services subscribed to, satisfaction with the service offerings of telecommunications providers, awareness of alternative services and switching behaviour. Among the highlights, the findings indicate that most customers are satisfied with the current

level of service being provided by their service providers. In the case of fixed-line services (including leased and toll-free lines) over 60% of the residential and commercial respondents indicated that they were satisfied with the service they received. Over 50% of residential and commercial respondents indicated that they have not experienced any problems with their mobile service.

Current Customer Subscriptions

To better understand the types of services respondents are subscribing to, survey respondents were asked a number of questions about the services they subscribe to. The survey results indicate that Jamaican households are three times more likely to own a mobile phone than a fixed-line phone. While 98% of the residential respondents subscribe to mobile phone service only 27% subscribe to a fixed-line phone. The most commonly mentioned reason for not having a telephone service was affordability (52%), while ten percent of households without telephone service cited “do not need it” as the reason for not having a telephone service. The 3% of Jamaicans households that are without any form of telephone service are distributed across all regions of the island but are more likely to be in the western region, i.e. Hanover, St. James and Westmoreland (9%). In the case of commercial respondents, 97% indicated that they had fixed-line phones. The three percent that are without fixed-line service use a mobile phone for communicating. Overall 42% of businesses reported that they subscribe to mobile services.

The residential users of the Internet tend to be in the 18-35 age group (36%) and are primarily from the upper (56%) and middle (41%) socio-economic groups. Approximately 41% of all residential users have Internet facilities at home. Other points of access for these users are schools (17%), Internet Cafes (14%), Public Libraries (12%) and the Post Offices (1%). Nearly 70% of businesses surveyed subscribe to an Internet service. Thirty-seven percent of these businesses give all members of their staff access to the Internet while 63% allow only some members of their staff to access the Internet at work. On average 70% of staff members in businesses with Internet service are given access.

Ways in which Telecommunication Services are used

Most fixed-line customers use the service mainly for making calls to fixed-line numbers. Eighty-five percent of residential respondents indicated that they do consider the price of calls when deciding whether to call a mobile phone from their landline. In the case of commercial customers, 64% said that price plays a very important role in deciding whether to call a mobile phone from their landline and 23% said that price is somewhat important. The mobile phone is largely relied on to place a range of different types of calls. However, ninety-seven percent of residential respondents with a mobile phone service mainly use it to make calls to other mobile phones.

Fixed wire Dial-up and ADSL connections are used equally by residential customers. Other access technologies used include mobile wireless (used by 14% of internet users), Cable TV modem (6%) and fixed wireless phones (4%). The survey reveals that Internet Users spend an average of three hours per week on the internet. 85% of the respondents use the internet for information, 61% use the service for sending and receiving e-mails, 25% for chatting, 14% for shopping, 7% for bill payment and 2% for music.

Drivers of Subscription and Termination/Retention

One of the goals of the survey was to determine the factors which influence a consumer's initial choice of service provider as well as the factors which influence the continuation or termination of a particular service. Given the limited competition available in the fixed segment at the time of the survey the questions regarding choice of providers were directed only to mobile and Internet users.

Drivers of Subscription

Thirty-four percent (34%) of residential mobile customers cited *price* as the single most important factor considered when deciding which mobile provider to subscribe to. The second most important factor cited was the *network coverage of the relevant provider* (22%). Other factors mentioned include, price of phones sold, reputation of the company and types of phones sold.

Eleven percent of residential and 42% of commercial mobile users subscribe to the services of more than one operator. The most commonly cited reason for subscribing to multiple providers is the cost of off-net calls. Approximately 98% of residential respondents currently use a pre-paid service. The main reason given by households for the preference for pre-paid over post-paid service is that it is less expensive than post-paid (45%). Less hassle (47%) was the primary reason given by the 2% of respondents who use the post-paid service. Forty-three percent of organizations indicated that they subscribe only to pre-paid mobile services, while 28% subscribe only to post-paid service and 29% subscribe to both types of services. The main reason given by businesses (45%) for subscribing to pre-paid services is the ability to monitor call consumption and therefore cost. The main reason given for choosing a post-paid service is that it provides greater convenience as it allows one to make calls at any time (36%)

The results of the survey show that affordability (25%) is the main driver of choice of an ISP among households. Speed (18%) and availability (14%) are the other top reasons cited. The majority of businesses (87%) with Internet service currently use ADSL technology, 11% use dial-up while 3% use fixed wireless. Speed is the main driver of choice of Internet technology used by businesses (69%). Other key factors influencing choice of technology are: price (11%); suitability for a business (11%); package deal (4%); and reliability (3%).

Drivers of Termination and Retention

Sixty-six percent of current residential fixed-line customers are not likely to terminate their service within the next 12 months. Twenty-two percent are undecided, while approximately 12% say they are likely to do so. Sixty-one percent of respondents that are likely to terminate their fixed-line service are not sure when they will do so but 32% indicated that they will terminate within 3 months time. When respondents were asked the reason why they would terminate their fixed-line service the most commonly mentioned reason was *price* (58%), followed by *unreliable service* (23%) and *dissatisfaction with the packages currently available* (13%). Eighty-one percent of fixed line customers who say they are likely to terminate their fixed line service, will switch to a mobile phone. Thirteen percent plan to switch to another fixed-line supplier while 3% will switch to CWJ's pre-paid fixed-line service. Those residential customers who wish to retain their fixed-line service cite convenience (36%), satisfaction with

their service (16%) and the fact that it is less expensive than mobile (13%) as the main reasons for not wanting to switch

Eighty-four percent (84%) of businesses are not likely to terminate their fixed-line service within the next 12 months. Thirteen percent (13%) are indecisive while approximately 4% say they are likely to do so. Of that four percent that are likely to terminate, 62% are not quite sure when they will do so but 38% say they will terminate within 3 months time. Forty percent (40%) of commercial subscribers which intend to retain their fixed-line service said that fixed-line telephony is an essential tool in their business operations as this is their primary medium through which to stay in contact with suppliers and customers.

(III) Barriers to Sustainable Competition

The review sought to identify the market segment(s) in which effective and sustainable competition has been achieved as well any barriers to entry which may have stymied the development of sustainable competition. The assessment of the sector revealed that the competition which has developed in the retail mobile origination market among the three facilities-based competitors is sustainable. The market is not regulated and consumers have still been able to enjoy the benefits which derived from a competitive market. Facilities-based entrants in the mobile segment have entered at the retail level and have driven down retail prices. The competition provided by these entrants has also created significant opportunities for market innovation and is characterized by increased product differentiation and ultimately higher consumer welfare. There is also sustainable competition in the international segment of the sector which is also unregulated and in which the competition between both facilities and service-based operators has resulted in a wide variety of calling options and lower prices.

The same cannot be said for the fixed access and local call segment. The local access network remains one of the least competitive segments of the liberalized telecommunications sector. This is due to the existence of both structural and strategic barriers to competition in that segment of the sector. Structural barriers have more to do with industry conditions such as cost and demand rather than the tactical actions taken by firms and often arise due to network effects or economies

of scale. Companies wanting to enter the fixed segment have the option of building a duplicative local loop, but in most cases this may not be commercially feasible. Building out a duplicative local loop requires new entrants to make a very substantial sunk investment. It is therefore likely that new entrants would want to develop a subscriber base and thus a revenue stream prior to undertaking such a capital intensive undertaking. The incumbent has an advantage which is derived from the fact that it deployed its local access networks over a long period of time during which its investments were protected by exclusive rights and funded with monopoly rents.

Strategic barriers are intentionally created or enhanced by dominant firms to impede entry or force firms to exit a market. This type of barrier to entry is very effective in deterring service-based entry. The alternative to having one's own network is to buy access from a network operator. Buying wholesale access from an alternative to the incumbent's network may not be viable however, due to technological limitations or limited availability. Given that fixed access is a prerequisite for the provision of all other fixed-line products including ADSL services, service-based operators will be dependent on the incumbent to provide wholesale access to this vital link to consumers. It is a formidable task for a competitor to erode an incumbent's market share while at the same time having to purchase facilities from the same incumbent.

It is therefore not surprising that most of the allegations concerning anti-competitive conduct (exclusionary behaviour) in the Jamaican telecommunications sector are linked to the underlying issue of interconnection and other forms of access and include issues of which facilities should be provided on a mandatory basis and what terms and conditions these facilities should be provided. The feedback from CWJ's wholesale customers raises concerns that some types of behaviour by CWJ are both anti-competitive and commonplace. These include predatory pricing, margin squeeze and price and quality discrimination. Even where the individual allegations have not been proven, it is clear that the common view of these customers is that the current regulatory (ex-ante and ex-post) framework has proven ineffective in remedying the problem and has allowed CWJ to provide access to its external wholesale customers and its retail arm on different terms.

Regulatory Solutions

The elimination of barriers that hinder or prevent competition must be considered a high priority. It is recommended that the following changes be implemented to the regulatory framework:

(I) Strengthening and Expansion of the Current Ex-ante Access Regime

It is proposed that ex-ante access obligations, beyond the current interconnection requirements be placed on dominant network operators. The access obligations will provide access seekers with access to particular facilities on reasonable terms and conditions, and in doing so, place competitive pressure on CWJ or any other dominant carrier, which will ensure that all operators have an incentive to price their services in a manner which reflect the most efficient use of the underlying network. The implementation of such an access regime requires the development of a list of designated facilities/services to which these access obligations apply. It is recommended that prior to imposing mandated access for a particular service/facility, a determination be made as to the state of competition in the market for that service with and without mandated access. Where existing market conditions already allow for the competitive supply of services the access regime should not impose mandated access. This principle recognizes primarily the cost of providing wholesale access as well as potential disincentives to investment. The access obligations will be grounded in the “equality of access” principle. Equality of access requires that a dominant operator’s wholesale customers “have access to the same or a similar set of wholesale products, at the same prices and using the same or similar transactional processes” as the dominant operator’s retail arm has and does.

(II) Functional Separation

Functional separation is defined by the OECD as the “separation of different services into different divisions of the same firm, possibly with different management”. The implementation of functional separation will require that the division of the incumbent which is responsible for the sale of access to the declared services and facilities become a separate business arm from its other divisions. The functionally separate business will be obliged to strictly maintain the principle of equality of access among all its various wholesale customers (including between the company which it is part of and competing companies). Operational rules will be imposed to

control the flow of information between the newly created business unit and the other arms of the incumbent and to establish new management processes and modes of corporate governance within this new business unit. For instance the operational rules should require that the new entity has a separate board and that the bonus of managers in the unit be a function of the profit made by that unit rather than by the profit made by the entire company.

(III) Carrier Selection and Carrier Pre-Selection

Carrier selection is a mechanism which allows subscribers directly connected to a network to proactively select (using a short dialing prefix) an alternative service provider for some voice services. Carrier Pre-Selection (CPS) is a mechanism that allows end-users to select, in advance, alternative service providers to carry their calls without having to dial a prefix or install any special equipment at their premises. Both carrier selection and pre-selection, make entry easier by reducing the need for an upfront commitment by consumers and they encourage the unbundling of telecommunications services. The experience globally with these mechanisms is that they do facilitate competition in fixed-line services. In the UK for instance, take-up of carrier pre-selection service grew rapidly following its introduction in December 2001 and by June 2004, 12% of British Telecoms lines had carrier pre-selection.

(IV) Local Loop Unbundling

In practice, local loop unbundling enables other suppliers of telecommunications services direct access to a network operator's lines that go into customer premises. It is seen in many countries as being necessary to stimulate competition and lower prices for residential services. Local loop unbundling can take one of three forms, based on the extent to which the various components of the local loop are unbundled. These forms are: full unbundling (*i.e.* access to raw copper); line sharing or shared access; and bit stream access unbundling (*i.e.* wholesale data spectrum access).

The line-sharing and/or full unbundling formats will provide the preferred benefits of increased choice and efficient supply in the delivery of enhanced telecommunications services. In the absence of line-sharing and/or full unbundling the ability of access seekers to provide services

that are differentiated from those supplied by the incumbent will be inhibited. Direct access to local loop will enable entrants to bypass large sections of the incumbent's network, making the deployment of new infrastructure more economical and practical. The recommended forms of LLU allow competitors to mix their own network components with that of a dominant carrier in the most efficient manner and therefore promote quasi facilities-based competition in the interim.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Key milestones in the Jamaican telecommunications sector include the signing of the World Trade Organization's Agreement on Basic Telecommunications Services and the promulgation of the Telecommunications Act (the Act) in March 2000. The Act specified a phased liberalization process. The first phase began in April 2000 and lasted until September 2001 and during that time licences for the provision of domestic mobile services and Internet services were issued. Licences were also issued to companies wishing to re-sell the incumbent's international switched minutes. The second phase began in September 2001 and lasted until April 2003 and during this period licences were issued for domestic voice/data facilities and service provision. Cable television licensees wishing to provide internet services over their cable networks were also granted special internet service provider (ISP) licences. The third and final phase started in April 2003 and at that time all segments of the sector were opened to competition including the lucrative international voice/data market. To date, a total of four hundred and twenty six (426) telecoms licences have been granted.

1.2 Objectives of Liberalization

The underlying rationale for liberalization is that there are economic benefits attached to having a competitive telecommunications sector.¹ These benefits include:

- Increased investment and the modernization of the telecommunications sector
- Lower prices to telecommunications users
- Wider variety of and increased quality in service offerings
- Increase in economic growth

¹ The term "liberalization" for the purposes of this report means the facilitation of competition among firms within a flexible regulatory regime.

Jamaica's Telecommunications Policy of 1998, reflects the above objectives and in it the Government noted that "a modern telecommunications infrastructure is required not only to facilitate sustained growth but also to be an engine of growth and development". The Government also listed the following policy goals:

- a) The extension of wireless and wireline networks throughout the demographic and geographical spread of the country.
- b) Facilitating the provision of high quality services by a range of service providers
- c) Promoting the build-out of networks while balancing the need of firms to be profitable with the need to provide services to un-economic and/or remote areas and disadvantaged groups in society.
- d) Ensuring that the public and business sectors have access to innovative services at internationally competitive rates so as to stimulate social and economic developments.
- e) Ensuring that international and domestic connectivity are efficient and cost-competitive
- f) Fostering a regulatory environment that is responsive to the needs of investors and consumers.

1.3 Rationale for Review

The Minister of Industry, Technology, Energy and Commerce Honorable Phillip Paulwell pursuant to Sections 4(1)(g) and 6 of the Telecommunications Act 2000 and Sections 5(1)(b) and 9 of the Fair Competition Act directed that the Office of Utilities Regulation (OUR) in collaboration with the Fair Trading Commission (FTC) carry out an investigation of the telecommunications industry for the purpose of advising him on the overall impact of liberalization, particularly as regards the presence of barriers to sustainable competition; and the experience of new entrants.

While there were some obvious benefits of liberalization, to conduct an objective assessment and present as accurate a picture as possible, the OUR and the FTC found it necessary to conduct surveys of commercial and residential end-users and service providers in the sector. The OUR commissioned the services of Market Research Services Limited (MRSL) to conduct the survey of the end-users and the FTC conducted a survey of telecommunications licensees

1.4 Objective and Scope of the Review

Based on the objectives outlined above the regulatory framework implemented at the time of liberalization is supposed to facilitate outcomes such as increased investment, increased penetration rates, increased variety in service offerings and lower prices, Therefore if the telecommunications sector fails to exhibit these outcomes the regulatory framework may be inadequate. This sector review assesses how adequate the current regulatory framework has been in achieving the Government's stated objectives. It takes account of the development of the telecommunications sector over the past six years and future market developments which are expected to affect competition in the sector.

The scope of this review is wide; it has considered consumer issues as well as competition issues, and it has examined the fixed, mobile and international and Internet segments of the sector. The review sought to answer the following questions:

4. How has the sector performed in the post-liberalization period?
5. How satisfied are consumers with their suppliers and the range of their service offerings?
6. What are the threats to the competitive provisioning of telecommunications services?

1.5 Outline of Report

The review will be presented in five Chapters. The first Chapter outlines the rationale, objective and scope of this review. The second Chapter examines the post-liberalization performance of the telecommunications sector. The third Chapter presents the feedback from end-users of

telecommunications services. The fourth Chapter outlines the competition and regulatory issues in the sector. The fifth and final Chapter provides regulatory and technical solutions.

CHAPTER 2: THE SECTOR'S POST-LIBERALIZATION PERFORMANCE

2.1 Introduction

This section of the review will assess the sector's performance in the post-liberalization period by examining several factors. The first is the impact of liberalization on the level of investment and revenues in the sector as well as the resultant effect on economic growth (as measured by GDP). The second factor is the impact of liberalization on the characteristics and structure of the markets in the sector. Assessment of regulatory effects can be very difficult in that some effects are evident only in the long-term. The task is even more difficult in Jamaica due to the absence of a consolidated source of data on the number of operators in the sector, revenue earned and the nature of services provided by the various licensees. Where there was an absence of "official" information, indicators that are easily observed and/or readily available from other sources were used in the impact assessment.

2.2 Impact on Investment

Despite the fact that over the years the technological barriers to entry in the telecommunications sector have been eroded, the creation of a modern tele-communications sector still requires a huge outlay of capital. Liberalization of the sector along with the implementation of an appropriate regulatory framework is expected to attract the private investment required to finance the build-out and upgrade of telecommunications networks. The post-liberalization level of investment in a telecommunications sector is therefore a good indicator of whether liberalization will indeed result in an increase in the variety and improvement in the quality of service offerings by operators and the capability of operators to deploy new services in the long-run.

The available data indicates that the level of investment in the telecommunications sector has remained buoyant. Table 2.1 below shows the level of investment in the mobile segment of the sector during the period 2001-2005. The figures show that investment in that segment increased between 2001 and 2003 and after suffering a decline in 2004, it began to increase again in 2005.

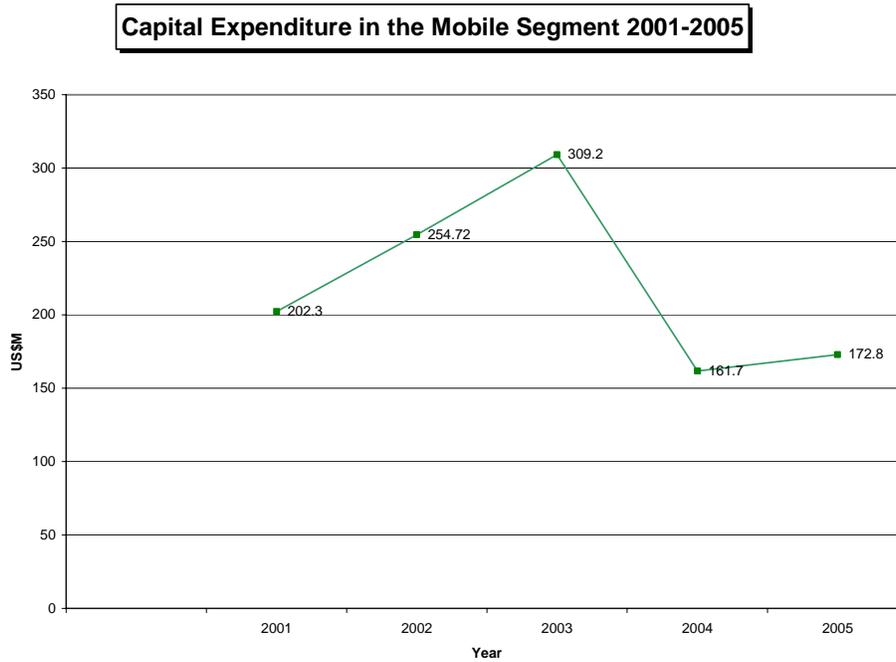
It is safe to assume that in the first three years of liberalization, investment in the mobile segment was the key driver of telecommunications investment. During this period, the entrants in this segment Mossel Ltd. (T/a Digicel), and Oceanic Digital Jamaica (T/a MiPhone) as well as the incumbent, Cable and Wireless Jamaica (CWJ), deployed and/or upgraded their mobile networks. Since liberalization, CWJ has also carried out an extensive upgrade of its fixed network in order to facilitate the deployment of ADSL. The company has announced further upgrades aimed at improving its broadband and VoIP services. The building of the Fibralink submarine cable and the deployment of Columbus Communications Limited's network have also contributed to the level of investment in the sector over the past two years.

Table 2.1: Capital Expenditure in the Mobile Segment 2001-2005

Year	Investment (US\$ M)
2001	202.3
2002	254.7
2003	309.2
2004	161.7
2005	172.8

Source of Data: OUR

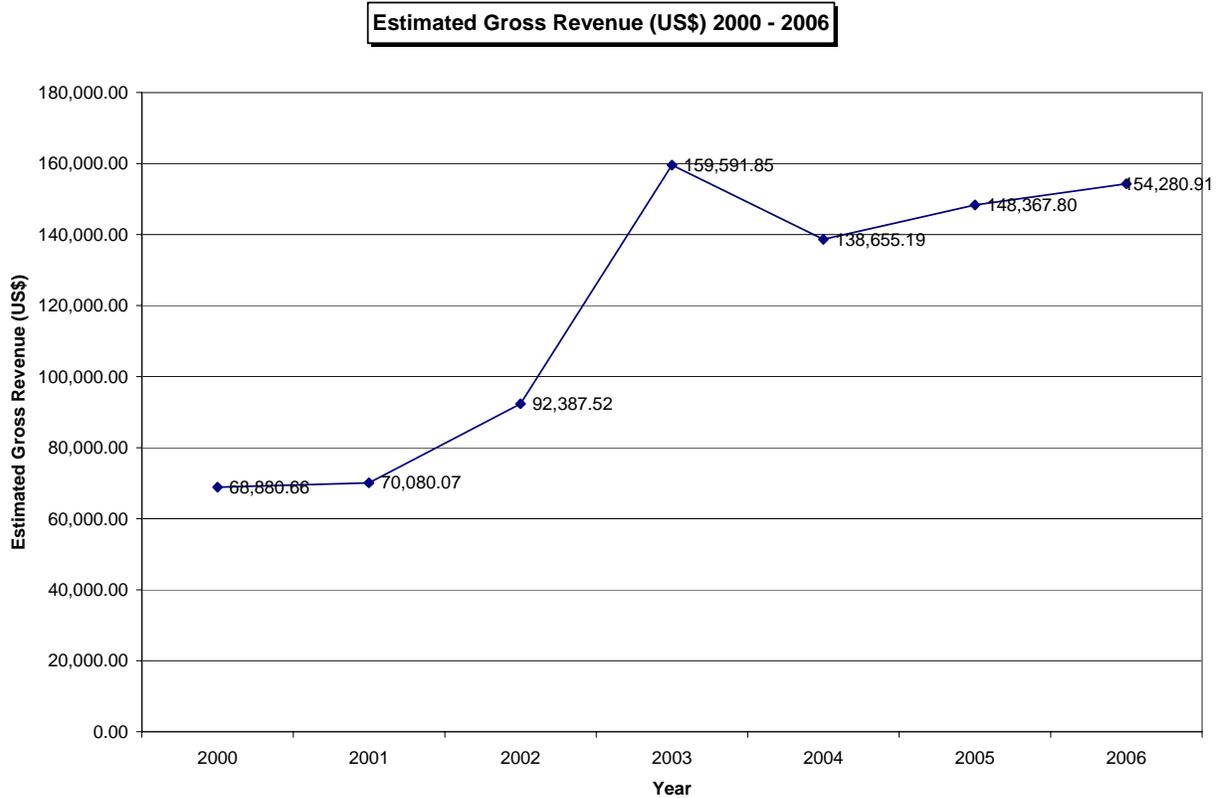
Figure 2.1: Capital Expenditure in the Mobile Segment 2001-2005



2.3 Impact on Revenues

The country's competitiveness in the international economy will be dependent on the deployment of innovative communications solutions, which in turn will be dependent on continuous network modernization/development in the sector. It is therefore essential to determine the impact which the liberalization process has had on revenues in the sector as this will affect operators' ability to modernize and expand their networks. Data on the sector revealed that revenues for the two largest operators in 2005 were 65% higher than they were in 2001 (see Figure 2.2 below).

Figure 2.2: Gross Revenue for the Two Largest Operators 2000-2006



Source of Data: OUR

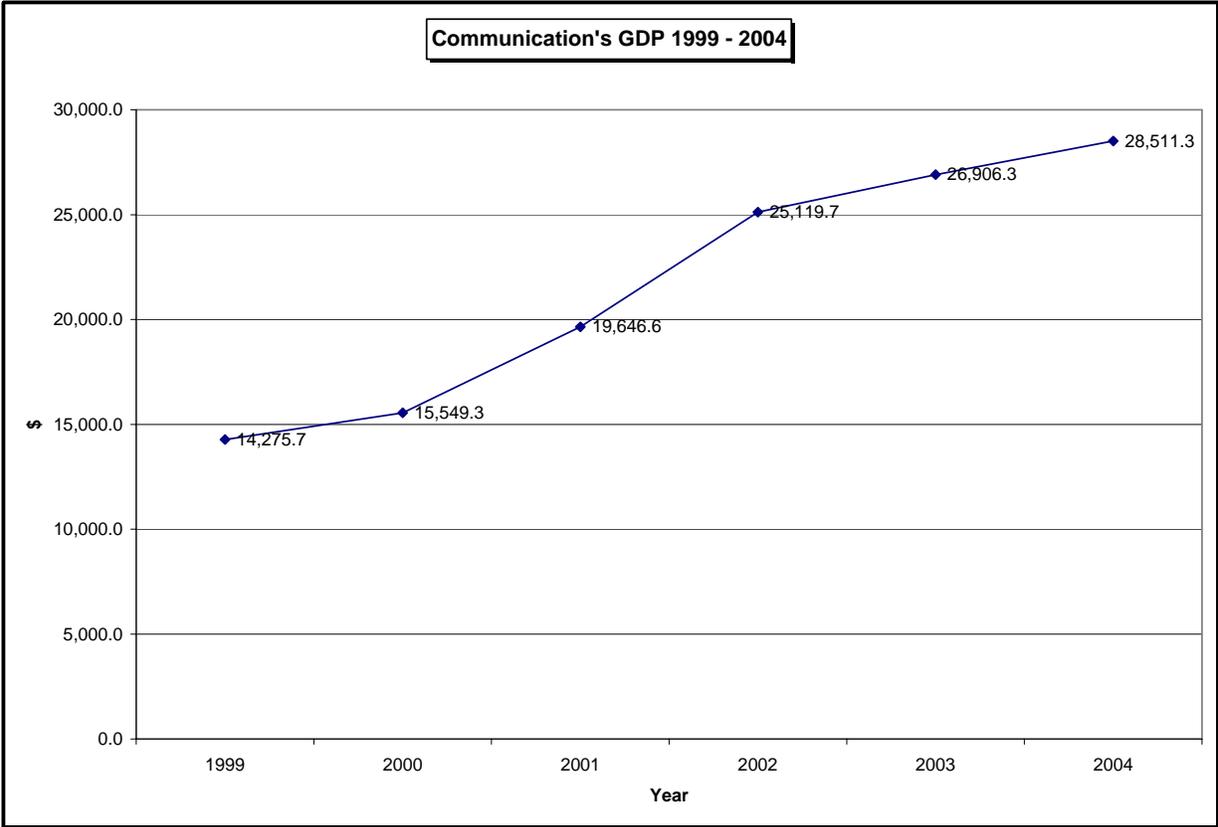
2.4 Impact on Economic Growth

Over the years analysts have linked improvements in a nation's economic position to the liberalization of its telecommunications sector. Telecommunications networks play an important role in the integration of the supply chain between the producer of goods and services and the individual retail customer. As economic activities become increasingly global and information intensive, the economic importance of telecommunications infrastructure has increased significantly. In fact, access to telecommunications services has become a necessary condition for participation in domestic and international markets. Therefore, greater efficiency in the telecommunications sector should in turn increase growth and output in other sectors. The reduction in prices and the wider availability and variety of telecommunications services will decrease input prices and spur innovation in other industries, thus resulting in productivity gains.

The increased efficiency of the telecommunications sector is especially important to the service-based industries as they are the most intensive users of telecommunications services.

The impact of telecommunications liberalization on Jamaica's economic growth was examined by using Gross Domestic Product (GDP) at current prices as a proxy. As can be seen in Figure 2.3 below, the sector's contribution to GDP has increased steadily since liberalization moving from J\$14275.7M in 1999 to J\$28511.3M in 2004.

Figure 2.3: Telecommunications Sector's Contribution to GDP 1999-2004



Source of Data: Statistical Institute of Jamaica

2.5 Impact on the Competitive Profile of the Market Segments

The most obvious effect of the liberalization process has been an increase in the number of licences issued in the sector. In fact, as at the end of 2006, 426 licences in 10 different licence categories had been issued (See Table 2.2 below). However, using the number of licences as a measure of competitive activity is very superficial especially in Jamaica where less than 10% of licensees are operational. To properly assess the level of competition in the telecommunications sector it is necessary to examine the behaviour of market players, the structure of the markets and the market outcomes of these behavioural and structural characteristics. More appropriate competition indicators include: the number of operators competing in a market; the market share of main players; the degree of concentration; prices and terms of access to wholesale services and facilities, retail prices, the variety and quality of service offerings and marketing strategies and the extent of vertical integration. Trends in market share can illustrate the level of market rivalry as the continuous ceding of market share by an incumbent is indicative of strong market competitors. Further, if current competitors have attained a reasonable level of market penetration, they are more likely to remain in the sector and pose an ongoing competitive constraint. Product innovation and price reductions give an indication of market rivalry as operators respond to changes in consumers' tastes and competitive conditions.

The state of competition is assessed in the following four market segments; mobile, fixed (wired and wireless), data transmission (Internet) and international.² There are two main types of operators which can exist within these service categories: the facilities-based (network) operator and the service-based operator. Facilities-based operators provide services using their own networks. Service-based operators provide retail services using facilities leased from a network operator. Competition in the telecommunications sector takes place at two functional levels; the wholesale level and the retail level. At the wholesale level facilities-based operators compete to provide wholesale access services and at the retail level integrated facilities-based operators compete with service-based providers to provide services to end-users. In Jamaica, the

² The market segments used in the assessment should not be interpreted as a definitive view of the delineation of particular markets. The identification of a market in competition analysis requires an assessment of four dimensions: product, geography, function and time. It is therefore possible that telecommunications markets defined using competition analysis may be more granulated than the categories used in this impact assessment.

Telecommunications Act (2000) acknowledges both facilities-based and service-based operators. The facilities-based operator requires both a carrier licence and a service provider licence while the service-based operator requires only a service provider licence.

Table 2.2: Number of Telecoms Licences Granted

Licences	2000	2001	2002	2003	2004	2005	2006	Total
ISP	0	45	12	3	14	2	4	80
ISP (STVO)	0	7	0	0	0	0	0	7
IVSP	0	31	10	6	5	1	0	53
DC	0	11	8	8	7	2	3	39
DVSP	0	17	8	13	6	2	2	48
DSP	0	22	2	5	1	2	1	33
FTZC	1	6	2	1	0	0	0	10
FTZSP	1	6	1	0	0	0	0	8
IC	0	0	0	48	20	5	3	76
INTL.SP	0	0	0	41	21	7	3	71
Total	2	145	43	125	74	21	16	426

Source: Office of Utilities Regulations

Key to Table

DC – Domestic Carrier; DSP – Data Service Provider; FTZC – Free Trade Zone Carrier; IVSP – International Voice Service Provider; ISP – (STVO) – Internet Service Provider for Subscriber Television Operators; DVSP – Domestic Voice Service Provider; ISP – Internet Service Provider; FTZSP – Free Trade Zone Service Provider; FTZC – Free Trade Zone Carrier; IC – International (Voice/Data/Transit); INTL.SP – International (Voice/Data Service Provider)

2.5.1 Retail Mobile Segment

Operators in the mobile market can fall into three broad competitive models. They may become facilities-based (carrier) service providers whereby they use their own network to provide retail mobile services. They could also choose to resell carriage services of a mobile carrier or they may become mobile virtual network operators by reselling the services of an existing network carrier but setting up a technical support layer which replicates the mobile carrier's switching center. There is significant scope for facilities-based competition in the mobile market and

currently three competitors- CWJ, Digicel and MiPhone- own mobile networks and operate both on a wholesale and retail basis.

Up to early 2007 CWJ operated dual networks, a TDMA and a GSM network. It has since migrated all its subscribers to the GSM network. Digicel operates a GSM network while ODJ operates a CDMA network. In March 2004, a fourth licence was issued to AT&T a US-based firm. Shortly after being awarded the licence, AT&T was acquired by Cingular Wireless who indicated that it would begin providing services in Jamaica by March 2005. This company later decided against entering the Jamaican market and forfeited its licence which the Government plans to re-auction. Recently, two operators have announced their intention to launch cellular services using MiPhone's CDMA network.

Table 2.3: Mobile Operators by Network Type and Launch Date

Operator	Technology	Spectrum Band	Build out Obligation	Launch Date
C&WJ	Time Division Multi Access (TDMA);	,800 MHz (TDMA);	None	1991
	Global System of Mobile Communications (GSM); General Packet Radio Services (GPRS)	1900 MHz (GSM)	None	2003
Digicel	GSM	900 MHz, 800, 1800 MHz	90 % geographic coverage	April 2001
Oceanic Digital Jamaica (ODJ)	Code Division Multi Access (CDMA)	800 MHz	90% geographic coverage. In 2003 this condition was changed to 90% population coverage.	November 2001

Source of Data: OUR/Providers

Since the liberalization process began in 2000, the mobile segment has undergone significant changes. Currently, the country boasts a mobile penetration rate which is higher than that of many developed countries. The mobile penetration rate has also increased from 9.6% in 2000 to approximately 94% in 2006 (see Table 2.4 and Figure 2.4 below). It should be noted that this penetration rate is reflective of consumers having more than one mobile subscription and could also include data SIM cards.³ By 2002, mobile subscriptions had surpassed fixed-line subscriptions and in 2006 there were approximately 7 mobile subscriptions for every fixed-line subscription.

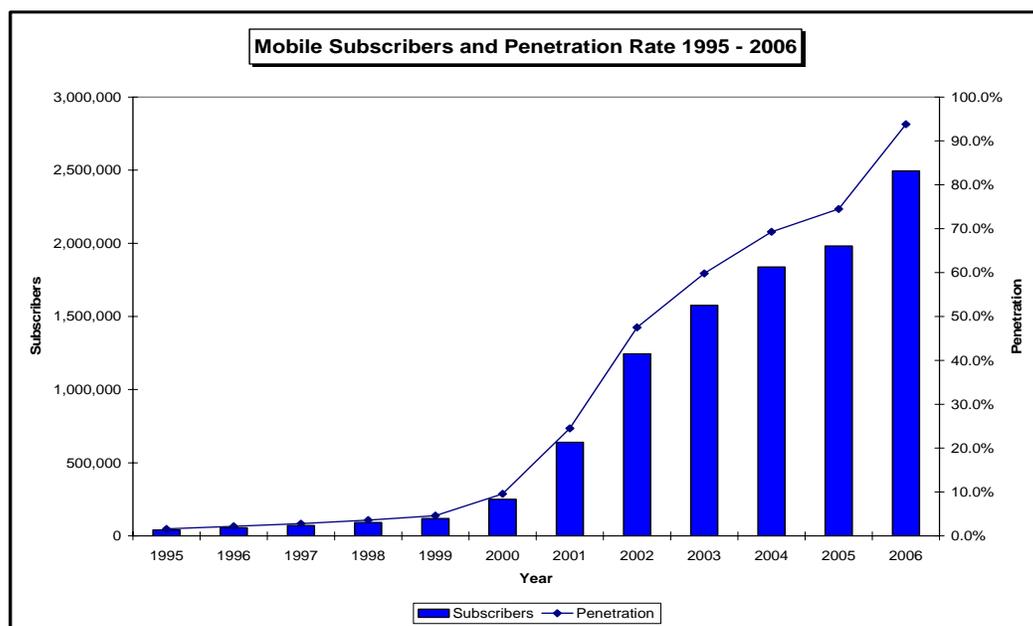
Table 2.4: Mobile Subscribers and Penetration Rate 1995 – 2006

Year	Subscribers	Penetration
1995	40,331	1.6%
1996	55,431	2.2%
1997	71,307	2.8%
1998	91,728	3.6%
1999	117,861	4.6%
2000	249,842	9.6%
2001	640,449	24.5%
2002	1,244,976	47.5%
2003	1,576,360	59.8%
2004	1,837,552	69.3%
2005	1,981,464	74.5%
2006	2,495,191	93.8%

Source of Data: OUR/Providers

³ Data cards are still a niche product.

Figure 2.4: Number of Mobile Subscribers and Penetration Rates 1995-2006



The significant increase in the penetration rate can be attributed to the handset subsidies offered by operators as well as pre-paid calling plans. The subsidized handsets allowed low-income users to sign-up with a low initial cost. Low-income users are also more likely to subscribe to pre-paid mobile services rather than to services such as post-paid mobile or fixed-line services whereby they have to pay a monthly access fee. The introduction of the calling party pays (CPP) billing scheme has also facilitated the growth in mobile penetration. With CPP, low-budget users can rely for the most part on incoming calls to keep their accounts active, thus enabling them to contain their expenditure. In fact, all prepaid-subscribers have to do to keep their subscriptions active, is add credit at least once every 90 days. The operators have also implemented several innovative ways to add credit to a mobile account such as phone to phone transfers and credit purchases via automated banking machines. Persons living abroad can also purchase credit on behalf of their relatives and friends in Jamaica.

Liberalization has significantly altered the structure of the mobile segment. Digicel, the first GSM entrant, commenced operations in April 2001. At the time of its launch Digicel's network covered approximately 80% of the island and by 2003 the network had island-wide coverage.

Within 100 days of the start of its operations Digicel announced that it had signed 100,000 subscribers. By 2002, the number of Digicel subscribers had surpassed the number of CWJ mobile subscribers. At the end of 2006 Digicel had a mobile subscriber market share of 76.1% compared to CWJ's 19.7%. MiPhone which commenced operations in late 2001 had acquired 103,649 subscribers at the end of 2006 which represents a market share of 4.2%. The change in the structure of the mobile segment since liberalization is obvious when one takes a look at the concentration ratio. In 2000, the Hirschman-Herfindahl Index (HHI) was at its maximum, i.e. 10000.⁴ With the entry of Digicel and MiPhone, the ratio has decreased and the HHI for 2006 was 6196 (see Table 2.5 below).⁵ The trend of the HHI shows that although the market is still highly concentrated it has been effectively transformed from its monopoly status. Spectrum requirements and the need to have sufficient infrastructure to achieve national geographic coverage are all factors which will result in this market remaining highly concentrated.

Table 2.5: Mobile Operators' Subscriber Market Share (%) 2000; 2004-2006

Operator	2000	2004	2005	2006
Digicel	0	69.0	69.5	76.1
C&W Jamaica	100.0	26.2	26.0	19.7
MiPhone (Oceanic)	0	4.8	4.5	4.2

Source of Data: OUR/Providers

⁴ The HHI is calculated by summing the squares of the individual market shares of all the market participants. When the value of the HHI is below 1000 the market is broadly characterized as being un-concentrated. When the HHI is between 1000 and 1800 the market is categorized as being moderately concentrated and when it is over 1800 the market is broadly categorized as being highly concentrated.

⁵ Note that with the HHI above 1800 the market would still be broadly categorized as being concentrated.

Table 2.6: Concentration Ratio for the Mobile Segment – 2000; 2004-2006

Dates	HHI
2000	10000
2004	5456.36
2005	5526.50
2006	6196.94

Digicel’s successful entry can be attributed to several factors. At the time of its entry, its network coverage surpassed both CWJ’s fixed and mobile networks. This meant that a large portion of the population which did not have access to either of CWJ’s voice services due to limited network coverage were now able to access service via Digicel’s network. Another factor in Digicel’s successful entry was that consumers found its GSM-based service more attractive than CWJ’s existing TDMA-based service due to the fact that the former’s service has more functionality. Despite having the lowest on-net rates, MiPhone has failed to make any significant gain in its market share.⁶ This may be due to the pace at which it deployed its networks as well as the vast difference between off-net and on-net call rates.⁷ Higher off-net tariffs means networks with the most subscribers will be more attractive to potential subscribers. In addition, the lack of number portability may make current subscribers unwilling to switch networks, It may therefore be difficult for MiPhone to gain market share even with its low on-net innovative service offerings and low on-net rates.

The retail mobile segment is competitive. For the most part however, the competition is not based on price particularly with respect to pre-paid plans. Except for the introduction of CWJ’s Anyone Plan in 2005, “listed domestic nominal tariffs” have not changed since the initial price-adjustment at the start of the liberalization (See Figures 2.5, 2.6 and 2.7 below). The mobile operators compete on non-price factors such as variety of calling plans, network coverage

⁶ An on-net call is a mobile-to-mobile call from one mobile network and terminating on the same mobile network. An off-net call is a mobile-to-mobile call from one mobile network and terminating on a different mobile network.

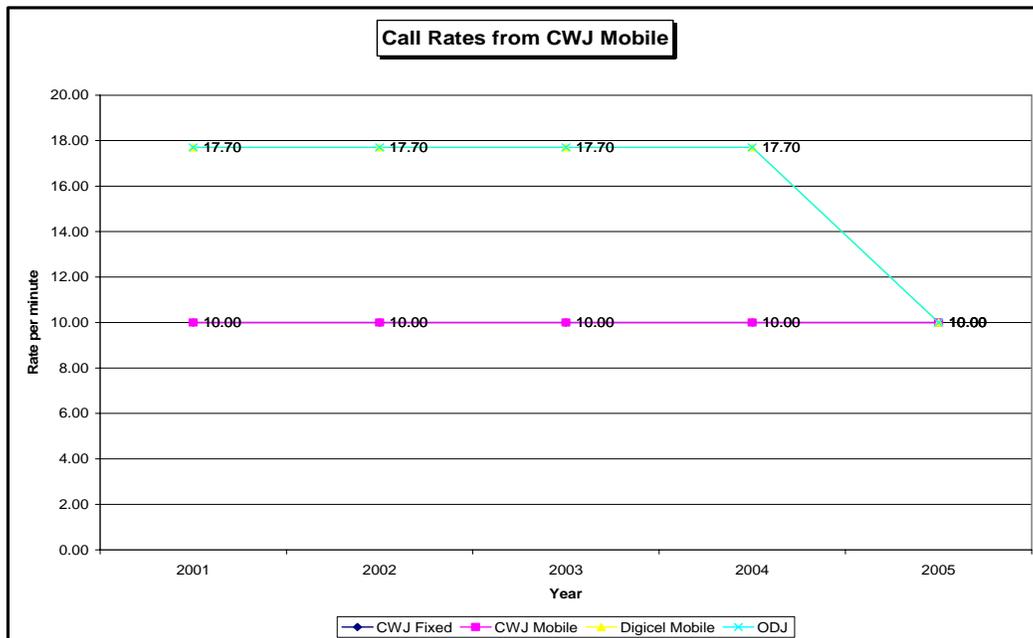
⁷ CWJ is the exception to this rule, under its “Anyone Plan” on-net and off-net calls are billed at the same rate.

(number of cell sites), the number of retail agents and advertising expenditures⁸. All these factors allow an operator to differentiate its service from that of its competitors. The absence of retail regulation in the mobile segment allows the operators to target different consumer groups by offering a wide variety of multidimensional calling plans. One mobile operator currently offers 5 business and 5 personal postpaid packages in addition to its prepaid plan. These post-paid plans differ according to their monthly access fees, the number of bundled minutes and the variety of services offered under each plan.

Table 2.7: CWJ’s Mobile Pre-Paid Tariffs 2001-2005

Date	To CWJ Fixed	To CWJ Mobile	To Digicel	To ODJ
2001	10.00	10.00	17.70	17.70
2002	10.00	10.00	17.70	17.70
2003	10.00	10.00	17.70	17.70
2004	10.00	10.00	17.70	17.70
2005	10.00	10.00	10.00	10.00

Figure 2.5: CWJ’s Mobile Pre-Paid Tariffs 2001-2005



⁸ Cable and Wireless and Digicel are among the top firms with respect to the sponsorship of entertainment and sporting events.

Table 2.8: Digicel’s Mobile Pre-Paid Tariffs 2001-2005

Date	To CWJ Fixed	To CWJ Mobile	To Digicel	To ODJ
2001	12.00	17.70	10.00	17.70
2002	12.00	17.70	10.00	17.70
2003	12.00	17.70	10.00	17.70
2004	12.00	17.70	10.00	17.70
2005	12.00	17.70	10.00	17.70

Figure 2.6: Digicel’s Mobile Tariffs 2001-2005

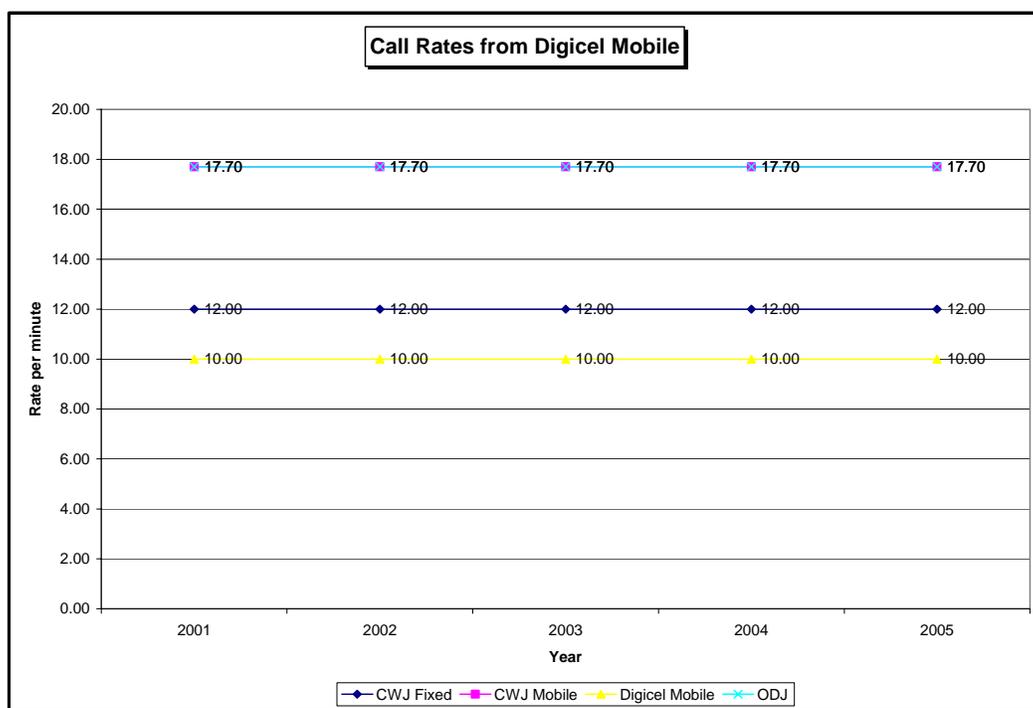
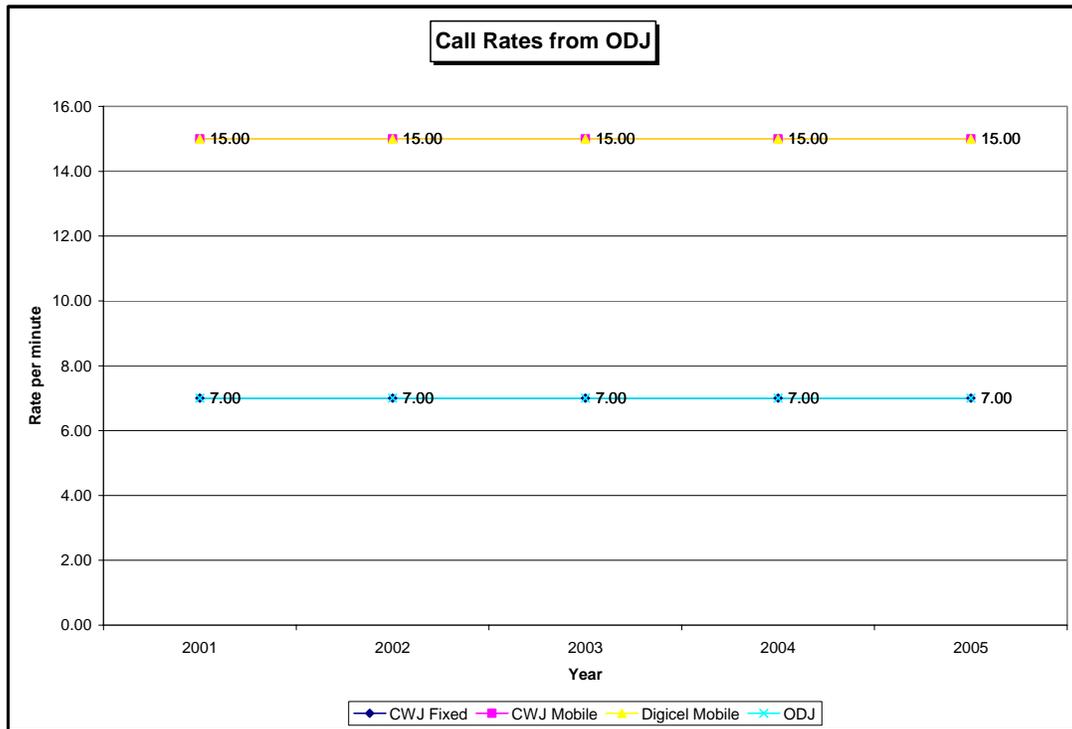


Table 2.9: ODJ’s Mobile Pre-paid Tariffs 2001-2005

Date	To CWJ Fixed	To CWJ Mobile	To Digicel	To ODJ
2001	7.00	15.00	15.00	7.00
2002	7.00	15.00	15.00	7.00
2003	7.00	15.00	15.00	7.00
2004	7.00	15.00	15.00	7.00
2005	7.00	15.00	15.00	7.00

Figure 2.7: ODJ's Mobile Tariffs 2001-2005



Given Jamaica’s population size and the current level of mobile penetration, the focus of competition in the mobile segment should shift from subscriber acquisition mode to subscriber retention mode as well as competing to secure most of the high spending subscribers. There is already evidence that this shift has started: mobile operators have decreased the level of handset subsidies and subscribers are now required to pay an additional sum for a SIM card when purchasing a handset. The operators have also started to target high spending subscribers with the provision of enhanced services. CWJ currently offers multimedia mobile applications and advanced mobile data services while Digicel offers web-based services such as Digicel Vibes, Digicel Mobile Web. It has also announced that it will soon be launching a mobile TV service. MiPhone is also currently offering mobile Internet services.

2.5.2 Fixed Access and Local Calls Segment

The fixed line infrastructure in Jamaica is a mix of wire and wireless technologies. Current market arrangements allow for two main competitive models. The first is the facilities-based model. In addition to the incumbent, CWJ, there are two other access providers in this segment,

GoTel Communications Limited (GoTel) and Columbus Communications of Jamaica Limited, (T/a Flow Jamaica Limited). CWJ operates a copper access network which has been fully digital since 1992. It also operates an aggregated Internet Protocol (IP) node which is connected to Cable and Wireless' Global IP network. In 2000, the company implemented a core Asynchronous Transfer Mode (ATM) network and in 2003 the ATM network was deployed throughout the island; this allowed CWJ to deploy ADSL services and improve the quality of its data services. GoTel's network uses fixed-wireless radio signals which also allow the company to provide its subscribers with Internet services. Flow operates a fiber optic cable network. There is a third access provider, CS Telecom who provides fixed access using mobile technology. Digicel has also announced the imminent roll-out of fixed wireless service.⁹ The second main competitive model in the fixed segment is the resale model and there are a few small operators reselling switched domestic minutes via calling cards.

Unlike the case of the mobile segment the penetration rate in the fixed segment is very low. The number of fixed lines increased steadily throughout the 1990s and peaked in 2001 when it reached 501,302. Since 2001, with the exception of 2003, there has been a downward trend in the number of fixed lines. As at 2006 the fixed penetration rate was 12.8% compared to 19.6 % in 2001 (see Table 2.10 and Figure 2.8 below). One factor which contributed to the decline in fixed lines penetration is the increase in mobile penetration. As mobile penetration increases, a significant proportion of calls originating on the mobile network do not have to connect with the fixed-line network at all. CWJ has launched a prepaid fixed-line service (Homefone) in an attempt to stem the migration from the fixed network.

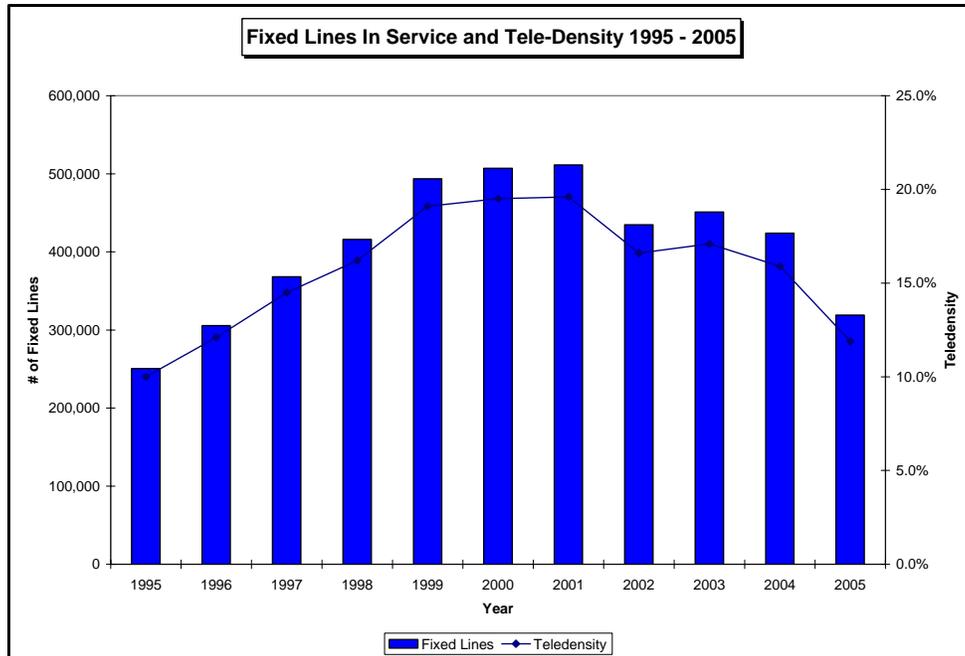
⁹ Some Cable TV operators have indicated that they are in the process of upgrading their networks in a bid to provide voice and data services.

Table 2.10: Fixed Lines in Service and Tele-density 1995-2005

Year	Fixed lines	Tele-density
1995	250,531	10.0%
1996	305,631	12.1%
1997	368,131	14.5%
1998	415,986	16.2%
1999	493,523	19.1%
2000	507,107	19.5%
2001	511,302	19.6%
2002	434,772	16.6%
2003	450,859	17.1%
2004	423,886	15.9%
2005	319,000	11.9%
2006	342,235	12.8%

Source of Data: OUR/Operators

Figure 2.8: Fixed Lines in Service and Tele-density 1995-2005



The decline in fixed penetration rates can also be attributed to the rate rebalancing which has been undertaken in the fixed segment. Prior to 2000, revenue from international calls was used to subsidize fixed access and local call rates. Liberalization of the sector required that these rates be rebalanced in order to facilitate the development of competition in the sector; and the rebalancing exercise has resulted in increases in the rates for local calls and fixed access (see Table 2.11 and Figures 2.9 and 2.10 below¹⁰).

Table 2.11: CWJ's Fixed-Line Rental Rates 1998-2005

Year	Business Access (J\$)	Residential Access (J\$)	Intra-Parish Usage (J\$)	Inter-Parish Usage (J\$)
1999	500	210	0.15	0.76
2000	660	280	0.23	0.91
2001	740	310	0.24	0.96
2002	880	380	0.40	1.05
2003	1000	400	0.52	1.10
2004	1250	500	0.6	1.10
2005	1250	500	0.9	0.9

Source of data: CWJ

¹⁰ The rates are for peak hours.

Figure 2.9: CWJ's Fixed-Line Rental Rates 1998-2005

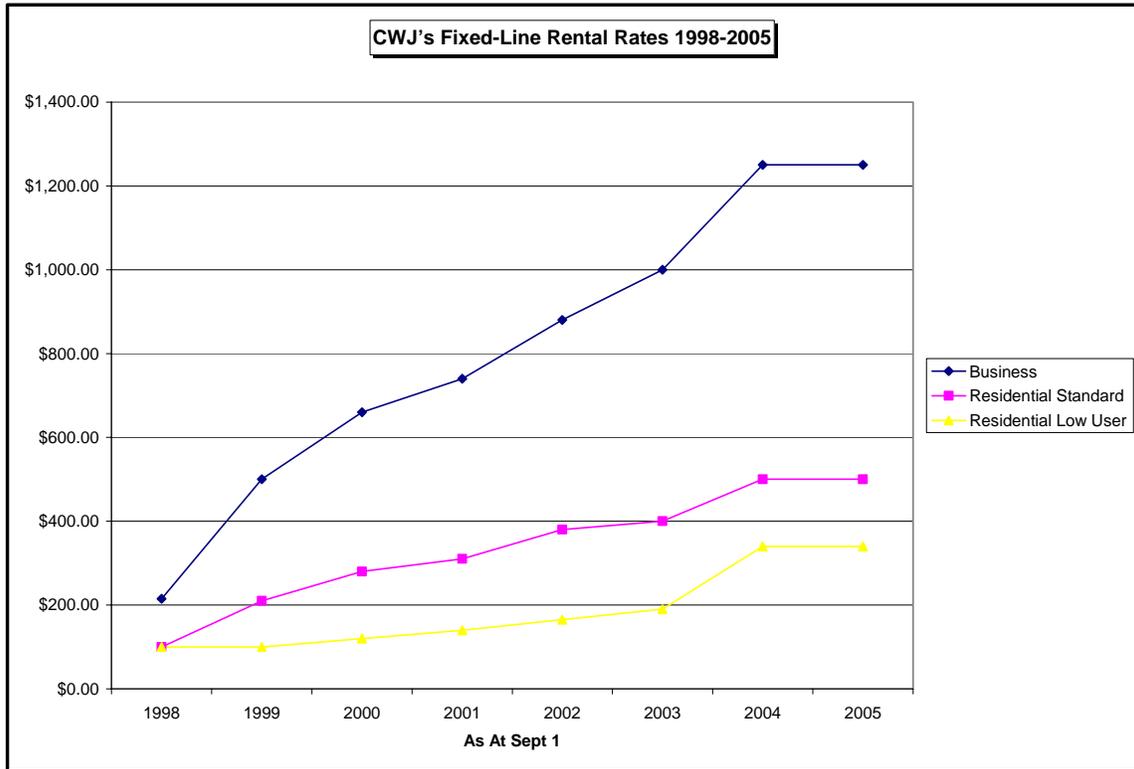


Figure 2.10: CWJ's Fixed Line Intra-Parish Tariffs 1999-2005

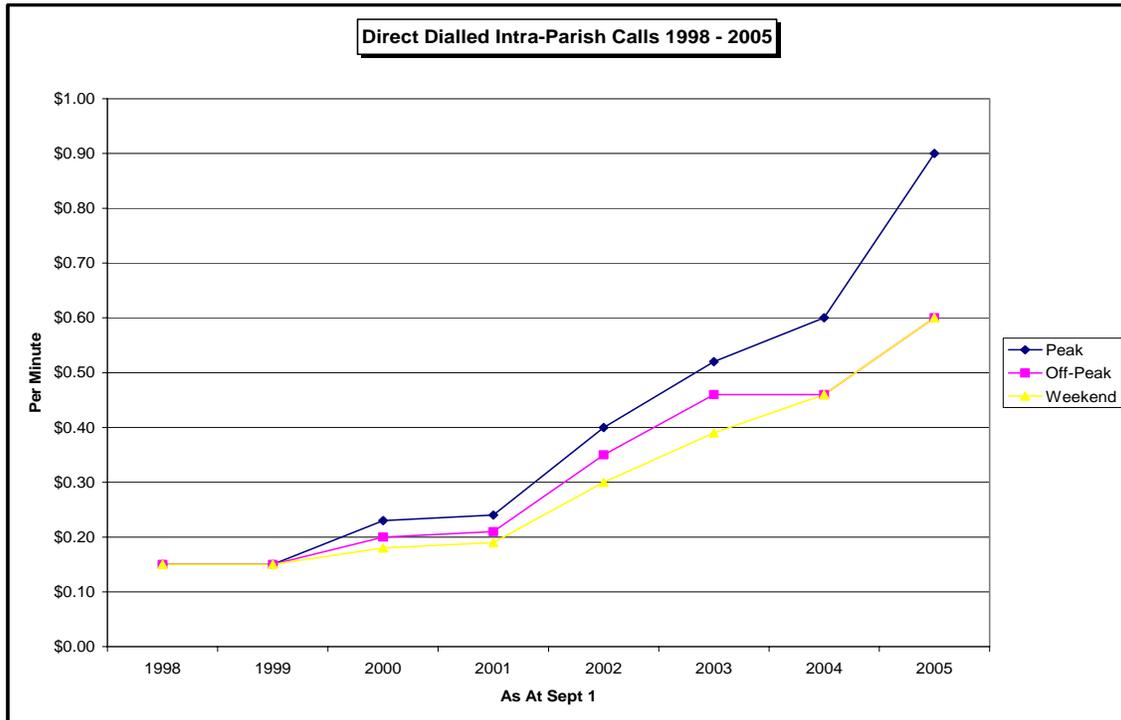
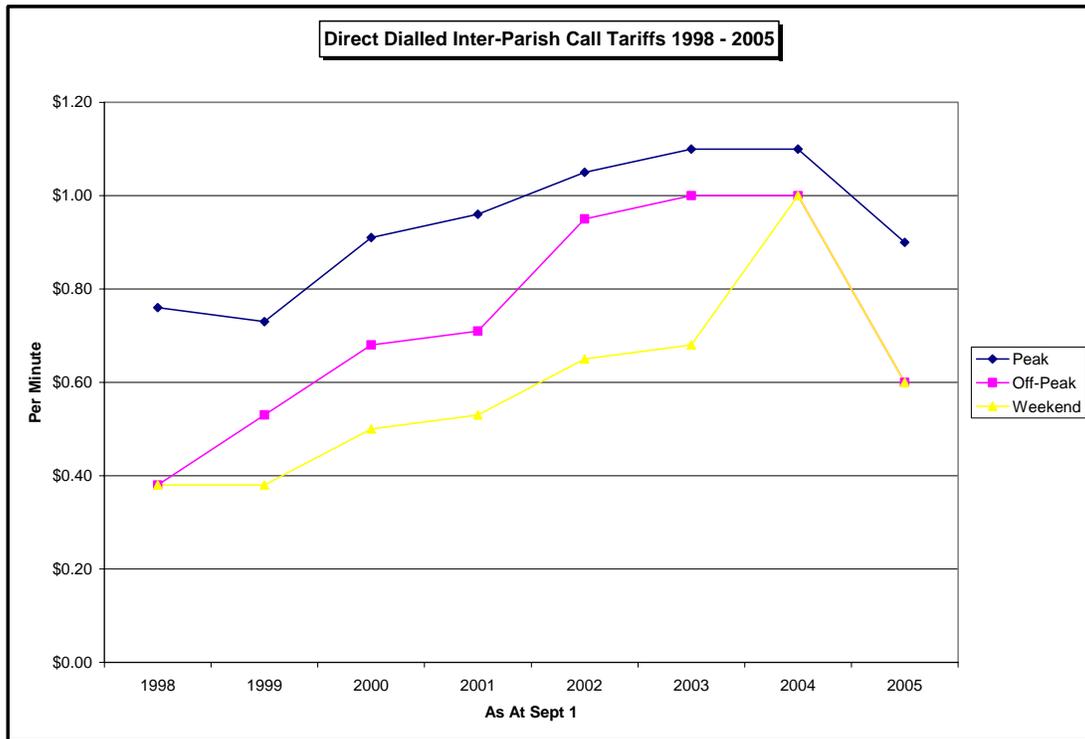


Figure 2.11: CWJ's Fixed Line Inter-Parish Tariffs 1999-2004



The fixed market segment has not experienced the same level of structural changes as the mobile segment has and therefore the level of competition is limited. As was mentioned earlier, in the case of retail fixed access the incumbent currently competes with three other access providers. CWJ is still the major supplier of retail fixed access with an overall market share of approximately 99% (see Table 2.12 below). Some of the alternative fixed access operators currently provide services only within the tri-parish area of Kingston, St. Andrew and St. Catherine. For instance, GoTel's wireless network has island-wide coverage but currently it provides services only in the tri-parish area. This means that outside of these parishes the CWJ network is still the only choice for consumers. This current pattern of network duplication, even in the face of many un-served rural areas, is due to the fact that the largest consumers of telecommunications services, i.e business subscribers, are located in the tri-parish area. This geographic concentration means that the development of customer access networks can be achieved more profitably.

In terms of local calls, the incumbent faces competition from the vertically-integrated facilities-based fixed access providers as well as service-based operators who provide calling card services and domestic VoIP services. However, the main alternative to the incumbent's PSTN-based local call services island-wide continues to be the mobile services. While a lack of industry-wide data relating to the provision of wholesale fixed access does not allow for market share calculations, one can infer from the service provider survey and anecdotal evidence that this market is very concentrated and that CWJ is still dominant in this market.

Table 2.12: Market Share of Operators in Retail Fixed Access Market Segment

	1999-2001	Dec 2002	Jan 2003	Feb 2003	Mar 2003 -2006
CWJ	100	99.5	99.3	99.1	99.0
Others	0	0.5	0.7	0.9	1.0
HHI	10000	9900.5	9860.98	9821.62	9802

Source of Data: OUR

Traditionally, facilities-based competition takes a while to develop in the fixed segment of telecommunications sectors but in some countries such as Australia and the UK, liberalization of this segment generally results in a significant number of service-based operators entering the market. Feedback from the service provider survey conducted has revealed that over the years, several service-based operators have entered the market and exited due to their inability to negotiate wholesale access rates which would allow them to make a commercially realistic rate of return on their investment. The limited competition in this sector can be attributed to the absence of competition-enhancing measures such as local loop unbundling, carrier selection and pre-selection. In other countries these measures have facilitated the entry of service-based operators in the fixed segment. It is expected that as Flow continues to deploy its network/services on an island-wide basis the level of competition will increase in both the wholesale and retail access markets.

2.5.3 Internet Segment

Internet services were first introduced in Jamaica in 1994 by CWJ. The Internet segment and the market for the provision of consumer premises equipment were the only markets in which competition was allowed prior to liberalization. CWJ's entry into the Internet market was shortly followed by that of InfoChannel, Jamaica Online and Cybervale, all three of which provided dial-up services using CWJ's network facilities. The Internet segment was liberalized during the first-phase of the liberalization process and by the end of 2001, 52 ISP licences had been issued. As at the end of 2006 there were 87 licensed ISPs, of which less than 20% were operational.¹¹ Initiatives by the Government and the private sector to provide free Internet access have resulted in a significant increase in the number of Internet users island-wide. In 2000, Internet users totaled 80,000 and by the end of 2004 this figure had increased to 1,067,000 (see Table 2.13 below).¹² Since liberalization, Internet penetration rates have increased steadily and there is evidence that broadband availability is contributing to this growth.

Table 2.13: Internet Users and Penetration Rate 1996-2004

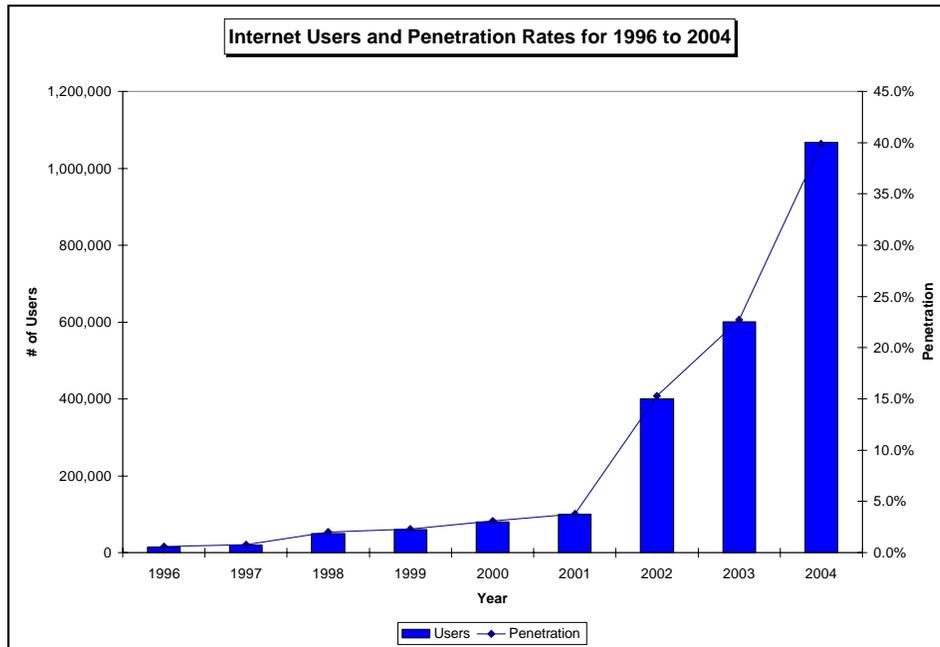
Year	Users	Penetration
1996	14,700	0.6%
1997	20,000	0.8%
1998	50,000	2.0%
1999	60,000	2.3%
2000	80,000	3.1%
2001	100,000	3.8%
2002	400,000	15.3%
2003	600,000	22.7%
2004	1,067,000	39.9%

Source: *Jamaica – Telecoms market overview* by Paul Budde Communication Ltd. (2006).

¹¹ The count of 87 includes 80 "regular" ISP licensees and 7 ISP for Subscriber Television Operators licences.

¹² In a 2003 Internet Study commissioned by Jamaica Promotions Corporation it was estimated that for every Internet subscription there were 7 users.

Figure 2.12: Internet Users and User Penetration Rates 1996-2004



Up to 2005, most internet customers subscribed to dial-up services. In a 2003 survey commissioned by JAMPRO, it was estimated that there were 69,000 internet subscribers in Jamaica of which 9,000 subscribed to Asymmetrical Digital Subscriber Line (ADSL) broadband services. At that time, C&WJ accounted for 50% of the dial-up subscribers and 100% of broadband subscribers. High speed Internet services can therefore be considered a fairly recent service offering, and providers are still in the early stages of building their ADSL subscriber base. Between October 2004 and October 2005, the number of broadband subscribers increased by a rate of 488%. This growth can be attributed to CWJ’s aggressive marketing of its ADSL service.

Beginning in late 2004, CWJ has significantly reduced its ADSL rates. The cost of its entry level service (128kbps down-link/64kbps up-link) was reduced from US\$66 per month to US\$45.00 per month in late 2004 and was further reduced in mid-2005 to US\$29.95 (see Table 2.14 below). CWJ also introduced a do-it-yourself set-up kit which significantly reduced the current initial provisioning cost of US\$39.99. Although the deployment of ADSL services has resulted in many persons migrating from dial-up to ADSL service, the total number of Internet subscribers continues to grow. This suggests that some new customers have chosen to subscribe

to ADSL rather than starting with dial-up and then upgrading to ADSL. It should be noted that currently Flow offers unlimited access at greater speeds at a comparative rate as illustrated in Table 2.15.

Table 2.14: Speed & Price of CWJ's Broadband Services

Period	Speed	Price (US\$)
Before July 7, 2005	128 Kbps	US\$45
July 7, 2005	128 Kbps	US\$29.95
August 2006	256 Kbps	US\$29.95

Source: Office of Utilities Regulation

Table 2.15: Flow's Broadband Services and Prices as at August 2006

Speed	Prices**	Hours Allocated	Cost for each additional hour
1,024 Kbps	US \$10.00	10 Hrs.	J\$50.00
1,024 Kbps	US \$19.00	30 Hrs.	J\$20.00
4,096 Kbps	US \$28.00	Unlimited	N/A
6,144 Kbps	US \$37.00	Unlimited	N/A

Source: Flow's website at www.flowjamaica.com

*NB: **The Jamaican dollars (Prices) were translated to US\$ using an exchange rate of US\$1: J\$66.00*

At the wholesale level of the Internet market there are backbone providers and transit providers. Until recently, all ISPs obtained their Internet connectivity and bandwidth from CWJ. This monopoly was broken in December 2004 when the Government issued two licences to build and operate submarine cable networks. One licensee, Fibralink, completed its submarine cable roll-out network in November 2005 and along with its subsidiary Flow, it has begun to provide wholesale Internet facilities to ISPs. The other licensee did not meet the ready for service date (December 2006), however, they are reported to be in negotiations with significant partners with the view of revising the project schedule.

At the retail level, ISPs compete to provide Internet access to business and residential subscribers. Most of the ISPs currently provide both dial-up and ADSL services, while some

ISPs such as Anbell, N5 and GoTel also provide secured wireless Internet services. In addition to mobile Internet, MiPhone and Digicel also provide Internet services which can be accessed via desktops and laptops. While most ISPs serve both residential and corporate customers there are some companies such as Island Networks Limited, which focus solely on providing data solutions for firms (including other ISPs).

Subscribers currently access the Internet by selecting from a range of service plans. These include plans where subscribers choose from a range of different hours/download options (dial-up service) and plans whereby users pay a monthly fee for unlimited access. The degree of customer choice ranges from all the existing operators (in the urban areas) to as few as one in some rural areas. CWJ and InfoChannel are the only ISPs with a national presence and prior to the introduction of the single national rate in 2005, they were the only ones capable of offering intra-parish rates to their subscribers in each parish. CWJ reportedly has the largest share of the market with over 50% of dial-up subscribers and over 80% of ADSL subscribers. The next largest ISP is InfoChannel. The retail Internet market has seen some consolidation since 2000 with InfoChannel acquiring World Telenet International, Jamaica Online, and the Internet portfolio of CompuServe.

Although there have been multiple operators in the Internet market since the mid-90s, the level of competition is far from intense; it still has not evolved into being a competitive market. One reason for this is that two important factors which determine market share in this segment are geographic reach and first mover advantage. Over the years this has given CWJ an edge over the competition as most ISPs are resellers of CWJ's wholesale services/facilities. This means that these ISPs are unable to benefit from any "first-mover or geographic reach" advantages. The pace at which the ADSL market has developed and the types of ADSL features available were effectively the decision of Cable and Wireless.

Further, the selection of an ISP by a consumer is largely driven by price and connectivity speed. In a 2004 study commissioned by the Ministry of Technology, Energy and Commerce and conducted by Peter Stern (a Canadian telecommunications consultant), it was noted that the scope for service-based ISPs competitors to offer a service at rates that are much lower than that

of CWJ's, is quite limited. The reason given for this limitation is the high prices of the inputs which are needed to supply Internet services such as channelized T1s and toll-free (1-888) numbers, all of which are provided by CWJ.¹³ In fact, in 2005 CWJ's aggressive pricing of its ADSL product while making broadband more affordable made it difficult for service-based ISPs to compete with CWJ. Following regulatory intervention CWJ introduced a white-labeled product which allows ISPs to brand and resell CWJ's retail Internet service.

The increase in facilities-based competition at the both the wholesale and retail levels of the Internet market should act as a constraint on CWJ's pricing of its PSTN-based facilities. It should also facilitate some amount of service differentiation as ISPs now have another source from which to purchase their wholesale facilities. However, facilities-based ISPs, such as Flow which have the capability to provide a triple-play of services can quickly gain a competitive advantage by offering cheaper Internet access as part of a bundled service package. Close attention will have to be paid to this market in order to ensure that any competitive advantage gained is solely as a result of superior competitive performance and not by way of anti-competitive practices such as predatory pricing.

2.5.4 International Market Segment

During Phase I and Phase II of the liberalization process the Minister granted 41 international voice service provider (IVSP) licences. The IVSP licences during this period allowed licensees to provide out-bound calls by reselling CWJ's switched international minutes. Up until the commencement of Phase III, CWJ had the exclusive rights to provide international outgoing and incoming calling services. Therefore prior to April 2003, CWJ's international gateway was the only point of hand-off for incoming calls. Calls intended for subscribers of other networks had to be switched via the CWJ international gateway prior to being handed off to the network to which the intended recipient of the call subscribes. Once the market was fully liberalized there was a flood of applications and by the end of 2006, the Minister had issued 76 international carrier

¹³ A T1 (also referred to as a leased line) transfers data between two points at up to 1.544 Mbps, with the same speed in each direction.

licences, 71 international voice/data service provider licences and 53 International service provider licences.

As can be seen from Figures 2.13 and 2.14 below, competition from resellers did put competitive pressure on CWJ's outgoing international call rates in the period between 2001 and 2003. For instance, during this time CWJ's per minute rates to the USA declined from J\$30.00 to J\$18.00 in 2002. Currently, it costs consumers J\$15.75 per minute to call from CWJ's fixed network and between \$14.50 and \$18.00 per minute to call from mobile networks. Flow's international voice service is provided as part of a bundle which also includes the access line and consumers can choose from a number of packages in which the number of international minutes ranges from 180-900. There are also several calling card and VIOP operators which offer international voice services at rates much lower than those on CWJ's fixed network and the three mobile networks. The option to compete as a calling card operator presents a simple entry strategy and calling card operators have had much better success in the international segment than in the domestic segment. They have also expanded their calling options in that their products can now be used to call countries such as Japan and India. In the past, calling card operators focused on the Caribbean, USA, Canada and the UK.

Figure 2.13: CWJ Mobile's and Digicel's International Call Rates to the USA

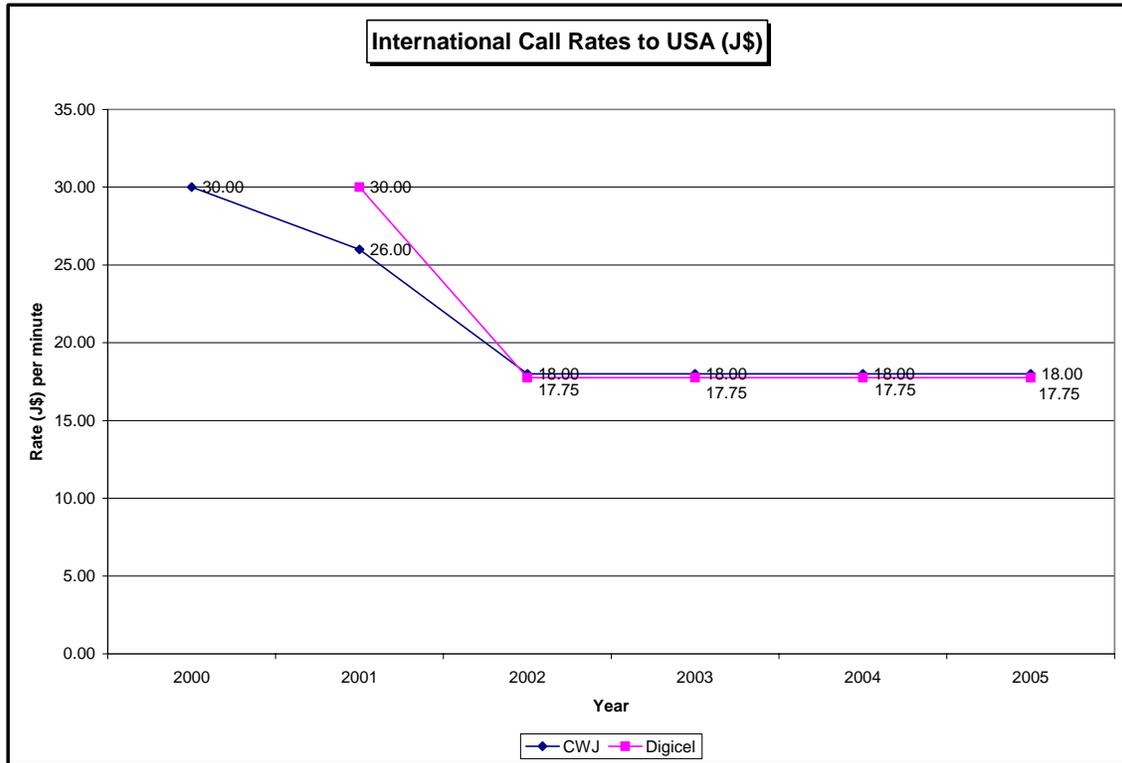
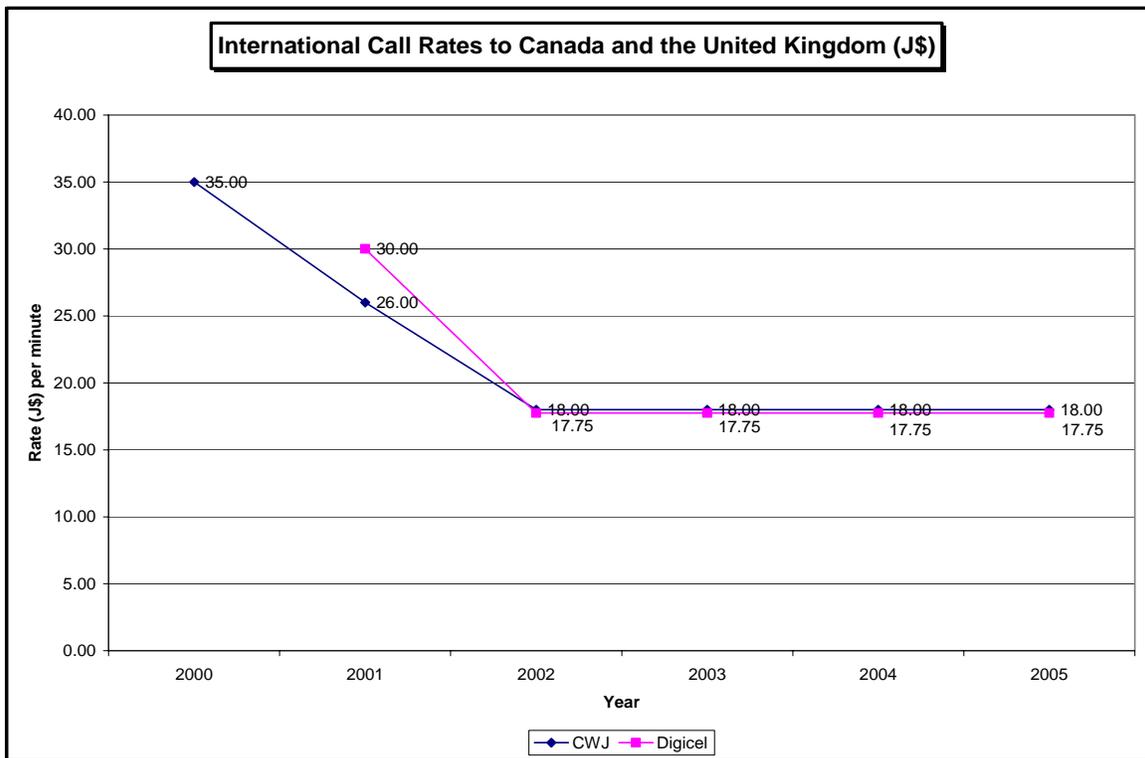


Figure 2.14: CWJ Mobile's and Digicel's International Call Rates to Canada and the UK



Jamaicans can anticipate further rate reductions in the coming years as according to telecommunications industry experts the charges for an international voice connection could be depressed to almost zero dollars as more operators begin utilizing VoIP services.¹⁴ The structure of the market has also changed significantly. Where there was a single supplier of outgoing calls in April 2000 consumers now have a choice from among three mobile carriers, two fixed line carriers and several service-based operators. The development of Internet-based calling programs such as Skype and Dial Pad also allows persons with Internet access to make international calls independently of the current licensees in the market. These programs are unlicensed, unregulated and low cost and therefore should have some impact on the level of competition in the market.¹⁵ While the international outgoing market is competitive it could benefit further from the presence of indirect access suppliers. There is also the scope for vertically-integrated facilities-based providers to disadvantage their down-stream competitors by inflating the rates for wholesale origination and termination on their networks.

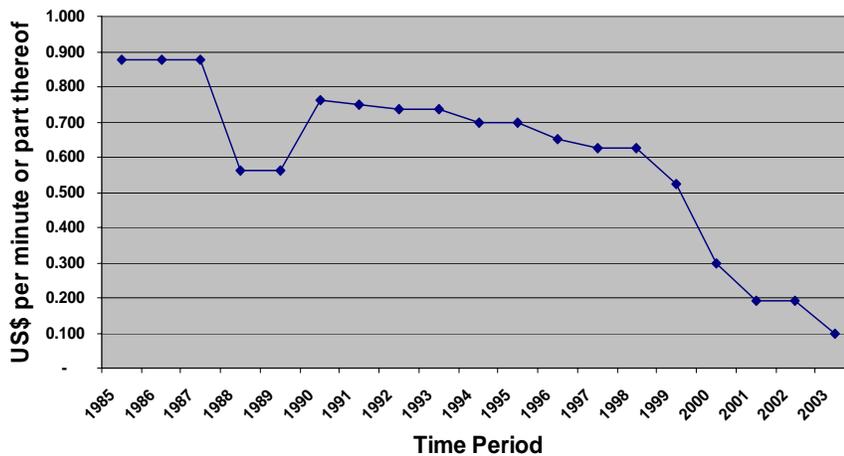
The liberalization of the sector has also affected the market for incoming calls. The large number of international carriers vying for the right to terminate incoming calls led to international settlement rates falling below the Federal Communications Commission's recommended rate of US\$0.19 (see Figure 2.15 below). In its Un-audited Consolidated Financial Statements for 2004 and 2005 CWJ noted that its international revenue had decreased due to a decline in international settlement rates. According to the company the decline was "exacerbated by the very large number of licences issued to companies who have no attendant obligations to invest in Jamaica". In late 2003 both Digicel and CWJ announced an increase in their termination rates. This move has had an adverse impact on the ability of international carriers which do not operate a domestic network to compete in the market for incoming international calls. The higher termination rate coupled with the low settlement rate resulted in a margin squeeze which made it impossible for these carriers to earn a reasonable return.

¹⁴See <http://www.globaltelecomsbusiness.com/default.asp?page=20&ISS=12591&SID=463681>

¹⁵ The quality of calls made using these programs is generally lower than that of calls made via a licensed network and this will have an impact on the extent to which they are used by businesses and some residential users.

In January 2004, the OUR attempted to create stability in the market when it issued a Directive aimed at establishing maximum termination and minimum settlement rates. The OUR's ruling was challenged by the licensees with a domestic network and in June 2004 OUR rescinded the ruling and announced that termination and settlement rates will be negotiated on a commercial basis. Since that time several international carriers have exited the market.

Figure 2.15: Settlement Rates in Jamaica, 1988-2003



2.6 Conclusions on Impact of Liberalization

If a quick look analysis of the post-liberalization telecommunications sector as a whole is undertaken, the result of the liberalization process has been successful in terms of outcomes such as increased penetration rates, lower prices and higher levels of investment. Disaggregating the sector analysis reveals however, that the impact of the liberalization process differs across the various market segments, particularly with respect to their competitive dynamics. Competition is strongest in the retail mobile and international segments of the sector. In fact, the mobile operators have emerged as the incumbent's main competitors; these operators compete directly with the incumbent's mobile network and they also provide some degree of inter-modal competition for its fixed network. In addition to price reductions, competition in the retail mobile segment has also resulted in the introduction of several innovative services.

While the growth rate of the mobile subscriber base is expected to decline given the high penetration rates achieved in that segment, it is expected that mobile subscriptions will continue

to be substantially higher than that of the fixed segment. This is due to the likelihood of multiple mobile subscriptions per household, coupled with a responsive target consumer group in the form of the nation's young adults. It is expected that the next growth driver in the mobile market will be data services. There is some concern about the discrimination between on-net and off-net rates. Further studies will have to be undertaken to determine its effect on consumer welfare.

The international segment has also registered positive results and it has benefited significantly from the entry of new operators (many of them service-based) who have driven down the rates for international calls. The incumbent is currently providing VoIP services and new entrants are either currently providing or planning to provide phone to phone VoIP services. The transmission of international calls using VoIP is expected to increase significantly as Internet penetration rates continue to increase and this should result in further reductions in international rates. The Internet segment has also benefited from the liberalization process albeit on a smaller scale than in the international and mobile segments. In addition to an increase in penetration rate, initial set up fees and monthly access fees have decreased. Internet and data services are increasing in relative importance and it is expected that carriers will continue to deploy broadband infrastructure. The take-up rates for broadband services will be dependent on how attractive these services are priced. The data and Internet market should provide further growth opportunities as computer penetration increases and business to business (B2B) transactions and e-commerce applications expand. It is also expected that the new submarine cable networks will trigger further developments in this market segment.

Competition is much less intense in the fixed market segment. CWJ's ownership of the copper local loop gives it significant control over the provision of fixed access retail and wholesale services. Currently, limited competition is provided at the wholesale level by Flow and at the retail level by Flow, CS Telecom, and GOTEL. An analysis of fixed line usage reveals that the volume of calls routed via the PSTN has decreased. This is particularly significant in the case of local calls, and is suggestive of the degree of mobile call substitution. As internet penetration increases and VIOP services become more available, revenues from voice services over the PSTN will continue to decline. Currently, Flow's triple-play menu of services provides the most viable means of eroding the incumbent's share of the fixed access market and increasing fixed

penetration rates. Sustainable service-based competition in the fixed segment will be dependent on the introduction of competition-enhancing initiatives (such as local loop unbundling and carrier selection and pre-selection) and the quality and the prices of wholesale access service provided by the facilities-based operators.

On the survey administered by the FTC, operators were asked to rate the level of competitiveness of the markets in which they operate and purchase facilities/services. All the operators who answered this question were of the opinion that CWJ's dominance in the provision of fixed access is unchallenged. The mobile and international markets as well as the internet markets were deemed to be competitive. The Table 2.16 below provides a summary of their ratings.

Table 2.16: Service Providers' Opinion on the Degree of Competitiveness in the Market Segments

TYPE OF MARKET	DEGREE OF COMPETITIVENESS		
	Not Competitive	Moderately Competitive	Competitive
International			x x x
Domestic fixed	x x x		
Mobile			x x
Dial-up Internet			xx
Broadband Internet		x	x

CHAPTER 3: CONSUMERS' FEEDBACK

3.1 Introduction

A survey of residential and commercial consumers was conducted to gauge their feedback regarding the telecommunications services subscribed to, satisfaction with the service offerings of telecommunications providers, awareness of alternative services and switching behaviour. The results of the survey are presented in this Chapter.

3.2 Subscription to Telecommunications Services

Consumers were asked “Do you or anyone in your household have a telephone service of any kind?” Ninety-seven percent of Jamaican households interviewed indicated that they have access to either a mobile or fixed line telephone service. The most commonly mentioned reason for not having a telephone service was affordability (52%), while ten percent of households without telephone service cited “do not need it” as the reason for not having a telephone service. The 3% of Jamaicans households that are without any form of telephone service are distributed across all regions of the island but are more likely to be in the western region, i.e. the parishes of Hanover, St. James and Westmoreland (9%).

3.2.1 Incidence of Mobile vs Fixed

Respondents from households with telephone service were asked to identify the types of services to which they subscribed. The responses revealed that Jamaican households are more than three times more likely to own a mobile phone than a fixed-line phone. While 98% of households own a mobile phone only 27% own a fixed-line phone. This represents a decrease of approximately 32% percentage points from the 2002 survey carried out by the OUR. In that survey, 59% of households reported owning a fixed line phone. Nearly three in every four households (74%) own only a mobile phone, while 2% own only a fixed line telephone. The remaining 24% own both mobile and fixed-line phones. The majority of fixed-line account holders are much more likely to own a single account rather than multiple accounts. In fact, only 7% of fixed line customers are multiple account holders. In contrast, eighty-two percent of Jamaican households have between one and four mobile accounts with the average being three mobile accounts per

households. The maximum number of accounts reported by a single household (less than 1%) is thirteen. It is noteworthy that approximately 82% of residential mobile accounts were acquired since the start of the liberalization period.

Residential respondents who stated that they subscribe to only a mobile service are more likely to reside in the Northern (St. Ann and Trelawney) and Southern (Clarendon, Manchester and St. Elizabeth) parts of the island while those who own both types of phones are more likely to reside in the Eastern (Kingston & St. Andrew, St. Catherine, Portland, St. Thomas and St. Mary) and Western (Hanover, St. James and Westmoreland) regions. The result also revealed that Jamaicans in the upper, middle and low income brackets are equally likely to own a mobile telephone. Respondents in the lower income bracket however, had the highest mobile only subscription rate (78%) of all income brackets, and this rate declined as the income bracket increased. Meanwhile, respondents in the upper income bracket are more likely to own both a mobile and fixed line telephone.

Table 3.1: Socio-Economic Profile of Fixed and Mobile Subscribers

Population Group	Mobile Only n=738	Fixed Line Only n=21	Mobile & Fixed n=241
Upper income	42%	2%	56%
Middle income	70%	2%	28%
Low income	78%	2%	20%
North	80%	1%	19%
South	80%	1%	19%
East	70%	2%	27%
West	75%	4%	22%

Ninety-seven percent of commercial customers surveyed indicated that they had fixed-line telephones. The three percent that are without fixed-line service use a mobile phone for communicating. Overall 42% of businesses reported that they subscribe to mobile services. The number of fixed-line accounts owned by businesses ranges from a maximum of 48 to a minimum of 1. The average number of fixed-line accounts in businesses is 6.

3.2.2 Incidence of Internet

Residential respondents who have logged on to the Internet tend to be in the 18-35 age group (36%) and are primarily from the upper (56%) and middle (41%) socio-economic groups. Approximately 41% of these users have Internet facilities at home. Other points of access for these users are schools (17%), Internet Cafes (14%), Public Libraries (12%) and the Post Offices (1%). Notwithstanding these various points of access, the workplace is the most typical point of access to the Internet (46% of users). Seventy-one percent of persons with full or partial responsibility for other members of their household have never logged on to the Internet. Males and females are equally (71%) as likely to have never logged on to the Internet. Non-users of the Internet are typically over the age of 45 years (86%), and fall in the low income group (77%).

Nearly 70% of businesses surveyed subscribe to an Internet service. Thirty-seven percent of these businesses give all members of their staff access to the Internet while 63% allow only some members of their staff to access the Internet at work. On average 70% of staff members in businesses with Internet service are given access. This translates into a broad estimate of approximately 509,618 persons who have access to the Internet at work.¹⁶

The majority of households with Internet service (75%) do not currently subscribe to VoIP. Forty-two percent (42%) of businesses with Internet currently subscribe to VoIP services.

¹⁶ **Explanation of how estimate was derived:** 70% of 970,700 = 679,490 persons employed in organisations (in the industries surveyed) that have Internet. 75% of 679,490 = 509,618

ADSL subscribers are highly concentrated in the urban areas of Kingston and St. Andrew (with a household penetration¹⁷ rate of 11.6%) compared to the rural areas such as Hanover (0.8%). The distribution pattern as indicated in Table 3.2 is typical for DSL service in other countries. This is due to the fact that DSL technology is *distance sensitive*. That is, the potential subscriber must be located within a certain distance (traditionally about 18000 ft/5 km) of the local phone company's hub (called a central office or public exchange). This makes it easier to roll out ADSL in densely populated urban areas.

Table 3.2: ADSL Subscribers by Parish, March 2006

Parishes	Subscribers	Estimated No. of Households per Parish
St. Catherine	6,500	134,377
Clarendon	968	64,668
St. Elizabeth	509	41,687
Hanover	163	20,283
Kingston & St. Andrew	22,414	192,712
Manchester	1,744	51,425
Portland	404	23,917
St. Ann	1,961	45,380
St. James	3,581	49,741
St. Mary	545	32,166
St. Thomas	394	28,211
Trelawny	277	21,732
Westmoreland	850	42,028
Total	40,310	748,327

Note: The estimates for the number of households are based on the 2001 Census Report.

Source: Cable and Wireless, Statistical Institute of Jamaica.

¹⁷ It should be noted that the available ADSL subscriber data was not disaggregated in terms of household and business, therefore, the household penetration by parish may be somewhat overstated. However, the distribution is likely to be similar.

3.2.3 Incidence of International Calling Cards

Even though calling card international rates are lower than those which obtain for the fixed and mobile networks, the survey shows that only 12% and 28% of business and residential customers respectively utilize this facility. One possible reason for this low incidence of usage may be the inability of users to use these calling cards across networks.

3.2.4 Incidence of Leased Lines and Toll-free Lines

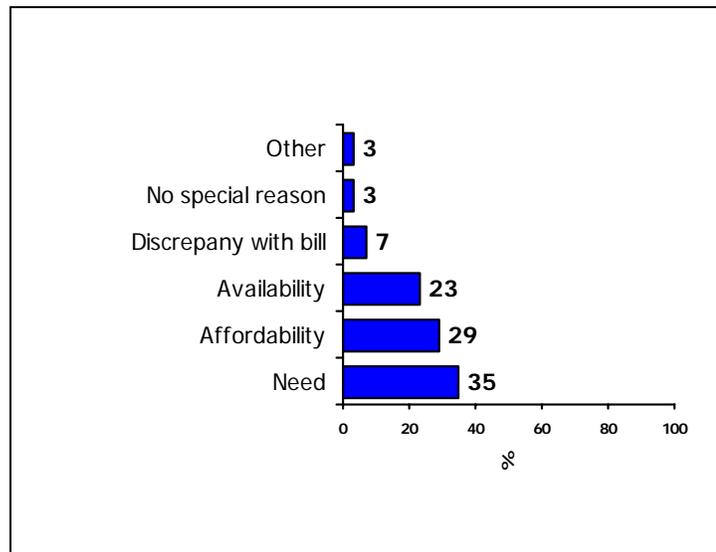
The vast majority of businesses, 75%, do not use or rent a local leased line. An even greater percentage, 96% do not use an international leased line. Eleven percent of businesses use local toll-free lines while 2% use international toll-free lines.

3.3 *Barriers to Phone Ownership*

3.3.1 Fixed Line

Respondents without fixed line service cited “need”, “affordability” and “availability” as the main reasons for not having the service. Thirty-five percent (35%) of household respondents without a fixed line account do not consider the service to be essential, while 29% are interested in acquiring fixed line service but cannot afford it. Another twenty-three percent indicated that they are interested in subscribing to the service but it is not available in the area in which they are domiciled. Seven percent (7%) of the respondents no longer own a fixed-line due to discrepancies with their bill.

Figure 3.1 Reasons for Non-ownership of Fixed Lines

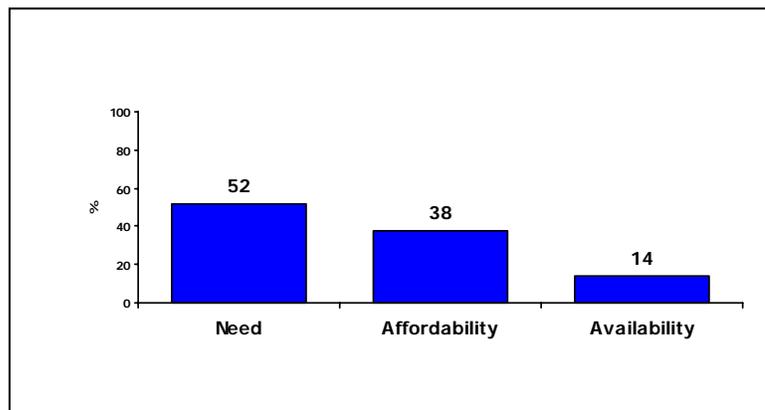


Source: OUR: (MRS: Telecommunication Market Survey, 2006)

3.3.2 Mobile

Respondents without mobile phone service also cited “need”, “affordability” and “availability” as the main reasons for not having the service. Fifty-two percent of households without mobile service indicated that they did not need the service and so they have not attempted to sign up for it. Thirty-eight percent say that while they need one, they simply cannot afford it. Fourteen percent (14%) of households without mobile service indicated that it was not available in their area of domicile. Interest in owning a mobile phone is relatively low among current non-owners. More than half of these persons assigned a score of 1 or 2 out of a maximum of 5, when asked to indicate their interest in subscribing to a mobile service. Ten percent remained indifferent assigning a score of 3 while 38% are interested in acquiring a mobile subscription. The latter set of persons assigned scores of 4 or 5 out of a maximum of 5. Of the number of persons interested in acquiring a subscription, 48% indicated that they are unlikely to acquire one in the next 12 months while 43% are likely to acquire one.

Figure 3.2: Reasons for Non-Ownership of Mobile Service



Source: OUR: (MRS: Telecommunication Market Survey, 2006)

3.3.3 Internet Service

Affordability and availability are the two main reasons given by residential consumers for not having an Internet subscription. There is still a large un-served market for Internet services as the majority of Internet users without Internet at home are interested in obtaining the service. These persons are prepared to apply for a fixed-line, fixed wireless or cable service in order to access the Internet at home. Interested persons are prepared to pay between J\$150 and J\$3,000 per month to access the Internet from their homes.

Nearly one third (31%) of businesses without Internet indicated that they were not interested in acquiring the service. Cost of service represents another major barrier to Internet subscription by Jamaican businesses; twenty-three percent of entities gave this as the main reason for not currently subscribing to the service. Another 10% do not subscribe to an Internet service because their businesses do not own a computer. Six percent do not subscribe because the service is not available in the area. Three percent of businesses are still weighing the possibility of acquiring the service while 1% are concerned that their employees might abuse it. Those businesses interested in acquiring the service are not prepared to spend more than JA\$2,000 per month for Internet access at a minimum speed of 256K/second.

3.4 Ways in which Telecommunications Services are used

3.4.1 Fixed Line

Most fixed-line customers use the service mainly for making calls to fixed-line numbers. Respondents were asked: “How important is the cost of calling a mobile phone from your landline when deciding whether or how often to make a mobile call?” Eighty-five percent of residential respondents indicated that they do consider the price of calls when deciding whether to call a mobile phone from their landline. Seventy percent of fixed line customers indicated that price plays a very important role in decisions regarding whether one should use a fixed line to make a mobile phone call, while 15% say that price is somewhat important. In the case of commercial customers, 64% said that price plays a very important role in deciding whether to call a mobile phone from their landline and 23% said that price is somewhat important

3.4.2 Mobile

The mobile phone is largely relied on to place a range of different types of calls. Ninety-seven percent of residential respondents with a mobile phone service use it to make calls to other mobile phones, while 80% use their mobile phones to place international calls. Mobile users are less likely to use their phones to make fixed-line calls. Nevertheless, 62% use their phones in this way. In the case of businesses 98% use their mobiles mainly to make calls to other mobiles. A significant 63% also use the mobile phone to make calls to fixed lines while 56% use it to make international calls. Nearly half (46%) the number of businesses that use their mobile phones to make international calls are making more of these types of calls now compared to three (3) years ago. Fifty-six percent indicated that the principal reason for this is an increase in their business connections overseas, while 24% attributed the increase in international calls to a decrease in international calling rates. A significant number (39%) however, say they are making fewer of such calls while 9% are making about the same number of these calls as they did three years ago. The remaining 6% could not readily say if their usage pattern has changed over the last three years.

3.4.3 Internet Services

Fixed wire Dial-up and ADSL connections are used equally by residential customers. er access technologies used include mobile wireless (used by 14% of internet users), Cable TV modem (6%) and fixed wireless phones (4%). The survey reveals that Internet Users spend an average of three hours per week on the internet. 85% of the respondents use the internet for information, 61% use the service for sending and receiving e-mails, 25% for chatting, 14% for shopping, 7% for bill payment and 2% for music.

3.5 Satisfaction with Telecommunications Service (Provider)

To evaluate customer satisfaction with the various services, respondents (residential and commercial) were asked a number of questions regarding the quality of their fixed-line, mobile, Internet, leased line and toll-free services. Respondents were also questioned about the response time of their service providers when faults are reported.

3.5.1 Fixed-Line

Respondents, both residential and commercial, were asked: “*How do you rate your landline telephone service on a) ability to hear your party clearly and b) customer service?*” Most customers expressed satisfaction with the current level of service from the providers. Corporate Jamaica reports a higher level of satisfaction with the service received from fixed line operators than do residential consumers. Among commercial customers, satisfaction levels of 75% were reported for the fixed telephone services, while residential customers recorded a satisfaction level of 70% for fixed telephone services. Ninety-two percent (92%) of businesses rate the clarity of the network as either being very good or good, compared to the 80% of residential consumers who assigned a similar rating to this attribute. With respect to customer service, fixed-line operators received ratings of 75% from commercial customers and 70% from residential customers.

Respondents were also asked: “*How many days on average does it take your service provider to solve faults on your telephone/problems with your bills?*” While the majority of residential

subscribers, 67%, have experienced faulty telephone lines and have lodged reports regarding these faults, the majority of fixed line residential customers, 62%, have never encountered a problem with their telephone bills. The time taken by suppliers to resolve reported faults by residential subscribers range between one (1) and sixty (60) days with the average resolution time is three (3) days. A similar resolution time is reported for corrections of bills. Residential fixed-line customers wait an average of 2 days for problems regarding their bills to be resolved.

Fifteen percent of commercial customers interviewed have never had reason to report a fault on their fixed-line telephone. Fifty-two percent of businesses that reported a fault with their fixed-line service typically waited in excess of 24 hours for the fault to be resolved. The majority, 66%, have never encountered a problem with their bill and those who did have had their problems resolved in an average time of three days.

3.5.2 Mobile Services

Respondents were asked “What is the main problem that you experience with your mobile phone service?” Fifty percent of residential respondents indicated that they have not experienced any problems with their mobile phone service. Among the remaining 50% who have experienced problems, poor reception/coverage is the main problem encountered (22%). Jammed lines (14%), difficulties in adding credit (4%) and dropped calls (3%) are some of the other problems experienced. Reception/coverage is the main problem encountered by customers of all three providers. Customers of MiPhone were more likely than customers of C&W and Digicel to encounter this problem while “jammed lines’ are more likely to be experienced by Digicel’s customers than by customers of C&W and MiPhone.

Jamaican businesses report high levels of satisfaction with their main mobile service provider. Fifty-three percent (53%) say they are very satisfied with the service received and 32% are somewhat satisfied. MiPhone customers reported higher levels of satisfaction with their provider than the subscribers of the other mobile operators did. More specifically, a rating of “very satisfied” was given by 67% of MiPhone’s customers, 55% of Digicel’s customers and 47% of CWJ’s customers. Sixty-five percent of organizations experience no problems with their mobile

phone service. Among the remaining 35% that do, poor reception/coverage is the main problem encountered (25%). Dropped calls (16%), no signal (5%) and difficulty adding credit (3%) are some of the other problems experienced by businesses. The responses from the survey indicated that customers of MiPhone were more likely to experience problems of poor reception and dropped calls than are customers of CWJ and Digicel, who are equally likely to have such experiences.

3.5.3 Internet Services

Fifty-three percent of residential Internet customers indicated that they have not experienced any problems with ISPs. For those who had problems with their Internet service the main problem encountered was in the area of access speed (31%). Other problems encountered by residential subscribers were inconsistent service levels (4%) and involuntary disconnections (4%). VoIP users reported an 81% overall satisfaction level with their service provider. The majority of NetSpeak users (91%) reported that they were satisfied with their service while eighty-six percent of Skype users indicated that they were satisfied with the service.

Commercial customers indicated a high level of satisfaction with their ISPs with 84% of entities being either “very satisfied” or “somewhat satisfied”. When asked to indicate the main problems which they experience with their Internet service, 63% of entities reported that they have not experienced any problems with their ISPs. Where problems were reported however, this was more likely to be in the area of down-time (18%). Access speed is another likely problem and was mentioned by 15% of commercial respondents. Three percent of organizations highlighted bad connection as the problem most frequently experienced. Eighty-four percent of commercial VoIP users are satisfied with their service provider, 2% reported being dissatisfied while the remaining 15% were indifferent.

3.5.4 Leased Lines and Toll-free Lines

Most users, 60%, agree that the quality of service that they receive from C&WJ on their leased line is of either very good or good standard. The remaining 40% assigned fair to poor ratings; 38% are of the view that the quality is fair while 2% agree that it is poor. Nevertheless, only 10%

say they are likely to change their service provider in the next 12 to 24 months, 66% are not likely to change while 24% are unsure. The majority (75%) of users of international leased lines indicated that the service they receive was either very good or good. It is still worth noting however, that remaining users said that the quality of service is either poor or very poor. Businesses respondents that use an international leased line service indicated that they are not likely to change their providers any time soon.

The majority of businesses that use local toll-free line service appear to be satisfied with the quality of the service that they receive. Seventy-five percent of them assign very good to good ratings to the service which they use. Accordingly, 75% of current users of local toll-free lines have no intention of changing their suppliers within the next 12 to 24 months. Businesses have little to no disaffection with the quality of service received from their international toll-free line service. Only 20% assigned a fair rating to the service, the remaining 80% of users agreed that the quality is either very good or good. It is no surprise then that none of the users of this service is likely to change their supplier in say the next 12 to 24 months.

3.6 Drivers of Subscription and Termination/Retention

One of the goals of the survey was to determine the factors which influence a consumer's initial choice of service provider as well as the factors which influence the continuation or termination of a particular service. Several survey questions addressed the reasons behind the initial choice of service provider while others focused on the likelihood of a respondent terminating or retaining his service as well as the reasons for either choice. Current subscribers to fixed-line services were also asked questions regarding the likelihood that they would terminate their service and rely exclusively on their mobile service.

3.6.1 Drivers of Subscription

Given the limited competition available in the fixed segment at the time of the survey the questions regarding choice of providers were directed to mobile and Internet users.

Mobile

When asked “*What is the main thing that you look for when thinking of subscribing to a mobile phone provider?*” 34% of residential mobile customers cited *price* as the single most important factor considered when deciding which mobile provider to subscribe to. The second most important factor cited was the *network coverage of the relevant provider* (22%). Other factors mentioned include, price of phones sold, reputation of the company and types of phones sold. Seventy-six percent of households which subscribe to the service of a single supplier subscribe to Digicel. This is to be compared to the 11% who use only CWJ and 1% who use only MiPhone. Eleven percent of residential mobile users subscribe to the services of more than one operator. The most commonly cited reason for subscribing to multiple providers is the cost of off-net calls (67%). Other reasons for using more than one supplier include: friends subscribe to a different provider (15%); when one is down, the other is up (7%); Internet service (2%); and free Credit (2%).

The respondents were also asked questions which sought to ascertain the reasons which would influence a mobile user to subscribe to pre-paid service as opposed to post-paid service and vice versa. Approximately 98% of residential respondents currently use a pre-paid service. Reasons given for the preference for pre-paid over post-paid service are: it is less expensive than post-paid (45%), it allows them to budget and control their call consumption (31%); it is convenient (13%); and it is the only one they are aware of (9%). Less hassle (47%) was the primary reason given by the 2% of respondents who use the post-paid service. The respondents also cited other reasons such as the ability to better control their bills (21%), more attractive package (16%) and service is less expensive (11%).

Fifty-eight percent of businesses subscribe to only one mobile operator. Thirty-five percent of businesses that rely on the services of a single operator do so because of the rates. The quality of service provided is also a common reason cited for using a sole operator (16%). Other factors that influence the use of a single supplier are: tradition/loyalty to the company (16%); they provide a package that suits our company’s needs (13%); and most people we deal with subscribe to this provider (11%). Most of the companies that use only one service provider subscribe to Digicel (36%) compared to the 16% and 6% which subscribe to only CWJ and

MiPhone respectively. It should be noted that companies with the largest number of mobile accounts tend to use CWJ while those with fewer accounts tend to use Digicel. In addition, although Digicel is used by 20% more companies than those which use CWJ, the latter has 22% more corporate mobile accounts than Digicel has.

The majority of businesses which subscribe to more than one supplier cited the fact that *“it is cheaper to call within networks”* as the reason for having multiple suppliers. *Fifty-three percent* of businesses that use the services of more than one mobile company identified Digicel as their main provider, while 40% identified CWJ. Where Digicel is the main provider, this is driven primarily by its relative popularity among their customers. Where CWJ is the main provider the main reasons given are confidence in its service and loyalty. Several businesses noted that CWJ introduced mobile technology to the island and that this engenders a fair amount of confidence in and loyalty to its service offerings.

When asked: *“Are the accounts that are owned by this organization on a prepaid service plan or a post-paid service plan?”* Forty-three percent of organizations indicated that they subscribe only to pre-paid mobile services, while 28% subscribe only to post-paid service and 29% subscribe to both types of services. The main reason given (45%) for subscribing to pre-paid services is the ability to monitor call consumption and therefore cost. The main reason given for choosing a post-paid service is that it provides greater convenience as it allows one to make calls at any time (36%). Other advantages associated with the use of the post-paid service are: more suited for Managers (30%); less expensive than pre-paid (15%); and phone cards are bothersome (13%).

Internet

The results of the survey show that affordability (25%) is the main driver of choice of an ISP among households. Speed (18%) and availability (14%) are the other top reasons cited. Cable & Wireless is the dominant player in the provisioning retail Internet service. Eighty-nine percent of

all businesses surveyed currently use CWJ. The reasons given for their choice are: it was the most readily available service (26%); traditional brand (22%); affordable rates (17%); good reputation (17%); and reliability (5%). The majority of businesses (87%) with Internet service currently use ADSL technology, 11% use dial-up while 3% use fixed wireless. Speed is the main driver of choice of Internet technology used by businesses (69%). Other key factors influencing choice of technology are: price (11%); suitability for a business (11%); package deal (4%); and reliability (3%).

3.6.2 Drivers of Termination/Retention

Respondents were asked “*How likely are you to terminate your land line service in the next 12 months time?/ How soon are you likely to do so?*” Sixty-six percent of current residential fixed-line customers are not likely to terminate their service within the next 12 months. Twenty-two percent are undecided, while approximately 12% say they are likely to do so. Sixty-one percent of respondents that are likely to terminate their fixed-line service are not sure when they will do so but 32% indicated that they will terminate within 3 months time. When respondents were asked the reason why they would terminate their fixed-line service the most commonly mentioned reason was *price* (58%), followed by *unreliable service* (23%) and *dissatisfaction with the packages currently available* (13%). Eighty-one percent of fixed line customers who say they are likely to terminate their fixed line service, will switch to a mobile phone. Thirteen percent plan to switch to another fixed-line supplier while 3% will switch to CWJ’s pre-paid fixed-line service. Those residential customers who wish to retain their fixed-line service cite convenience (36%), satisfaction with their service (16%) and the fact that it is less expensive than mobile (13%) as the main reasons for not wanting to switch. They would prefer however to be billed on a per second basis rather than on a per minute basis.

Eighty-four percent (84%) of businesses are not likely to terminate their fixed-line service within the next 12 months. Thirteen percent (13%) are indecisive while approximately 4% say they are likely to do so. Of that four percent that are likely to terminate, 62% are not quite sure when they will do so but 38% say they will terminate within 3 months time. Forty percent (40%) of commercial subscribers which intend to retain their fixed-line service said that fixed-line telephony is an essential tool in their business operations as this is their primary medium through

which to stay in contact with suppliers and customers. Other reasons cited include “no problems with the existing service” (13%), good service from current supplier (9%); “customers already know existing number” (8%), and “no alternative supplier” (4%).

3.7 Consumer Awareness

To evaluate consumer awareness respondents, in particular mobile users, were asked a number of questions regarding their knowledge of competing services, rates and information sources. The majority of mobile phone users were aware that it costs less to make fixed-to-fixed line calls than to make calls involving a mobile phone. Seventy-two percent of mobile phone users were especially aware that it costs less to make fixed-to-fixed line call than mobile-to-mobile even within the same network. Knowledge of this, however, has not deterred them from relying more on a mobile phone, although cost of calling is an important consideration to them. Some mobile phone users are of the impression that it is more expensive to make fixed-to-fixed line calls than to make calls involving a mobile phone. This impression was formed based on the cost of a fixed-to-mobile call.

Only 6% of residential mobile phone users experienced some difficulty obtaining information on rates for mobile services. The majority, 80%, say it is either very easy or somewhat easy for them to obtain such information. Seventy-four percent of businesses say it is either very easy or somewhat easy for them to obtain such information while 4% indicated that they do experience some difficulty obtaining information on rates for mobile services. Most residential mobile phone users (57%) are more likely to depend on their mobile service provider for information on rates and about the network to which a particular telephone number belongs. With respect to network identification 24% rely on the person being called for such information, 11% rely on friends/family, 6% rely on the telephone directory and 1% rely on the OUR.

3.8 Expenditure on Telecommunications Services

Based on data from the Planning Institute of Jamaica (PIOJ), expenditure on telephone services increased by 7.1 percent between the years 2002 and 2004 (see Table 3.3 below). The trend in

expenditure seems to be consistent with the growth rate in the overall subscriber base. This could either be interpreted as persons spending more minutes on each call or that given the increased in the number of subscribers there are more persons making calls. In fact, it is likely that both factors contributed to the growth in household expenditure.

Table 3.3: Jamaica Real Mean Monthly Household Expenditure, 2000-2002, 2004 (J\$)

Expenditure	2000	2001	2002	2004
Mortgage	1928.0	966.2	973.0	827.0
Rent	432.0	430.0	589.0	382.0
Electricity	121.0	134.0	133.0	123.0
Water	77.0	79.0	73.0	63.0
Telephone	138.0	175.0	185.0	143.0
Property Tax	5.0	5.0	9.0	11.0

3.8.1 Expenditure on Mobile

Residential mobile phone users spend between \$100 and \$8,000 per month for their mobile phone service. On average, these users spend \$1,476 per month for their mobile service. CWJ's customers are more likely to spend more than the overall average per month for their mobile service. They spend an average of \$1,936 per month compared to MiPhone users who spend \$1,438 and Digicel users who spend \$1,386. Businesses currently spend between \$1000 and \$300,000 per month on mobile phone service. The average expenditure for businesses is \$10,000 per month.

3.8.2 Expenditure on Internet

Households with Internet service spend between \$500 and \$5,000 monthly for their Internet service. The average monthly expenditure however, is \$2,000. Commercial customers spend between \$1,000 and \$300,000 per month for their Internet service, with the average monthly

being \$14,556. Businesses spend between \$1,300 and \$40,000 per month on their VoIP service. The average monthly expenditure on VoIP services is approximately \$6,000.

3.9 Interest in Number Portability

The majority of residential fixed line customers (75%) would like the option to keep their existing telephone number if they decided to change suppliers. Sixty-seven percent (67%) of those customers would be prepared to pay for such a facility and indicated that they would pay between JA\$10 and JA\$3,000 in order to port their existing number to a new provider. The average price residential customers were willing to pay is JA\$500. Eighty-three percent (83%) of commercial fixed-line customers would like the option to keep their existing telephone number if they were to decide to change suppliers. Of the remainder 16% of businesses were indifferent, while 1% would not want to keep the existing number. While keeping their number is important to them 57% of these businesses would not be prepared to pay for this “benefit”. Twenty-one percent were willing to pay but were unsure as to how much they would pay. The remaining 22% were willing to pay between \$100 and \$20,000 for the facility, with the average price being \$1,000.

In the case of mobile customers 81% of residential users would want to keep their current number if they were to change service provider. While 8% say they would want a new number, the remaining 11% say it would not matter to them. Sixty-three percent of commercial mobile customers say they would like the option to keep their existing mobile number should they decide to change their supplier. The majority of these entities would not expect to pay for this benefit. In fact, 65% of them say that they would expect operators to provide number portability free of charge. Among those businesses that would be prepared to pay for this benefit, \$2,000 is the maximum they would be willing to pay. Thirty-two percent of businesses were indifferent about number portability while 5% would rather have their existing number changed, should they decide to change their mobile service provider.

Although residential mobile phone users would like to keep their number when they switch service providers 72% of them also consider information about the network with which a

particular telephone number is associated to be very important. The most significant reason given for this is the cost of off-net calls (85%). Like their residential counterparts, commercial mobile customers (69%) also think that information about which network a particular telephone number is associated with is very important. Again, the most significant reason (85%) given for this is the cost of off-net calls. Currently 42% of mobile phone users are able to correctly match at least one telephone number to a particular network and they are concerned that the ability to port numbers will make this task even more difficult.

CHAPTER 4: BARRIERS TO SUSTAINABLE COMPETITION

4.1 Introduction

As was mentioned earlier in this document, competition provides benefits to end-users such as, lower prices, better quality and a wider variety of services over time and where the market structure of the sector gives rise to market power, competition may be inhibited. While economic theory emphasizes the importance of perfect competition in delivering efficient outcomes, the theoretical model of perfect competition is not a realistic standard by which to assess the state of competition in the telecommunications sector. In practice, the theory of effective or sustainable competition is more often applied. There are different definitions of sustainable competition depending on whether one is referring to short-term or long-term sustainability. Short-term sustainable competition requires that the firms that are operating in the market are viable in the long run. This therefore means that the threat of entry is not a sufficient criterion for sustainable competition. It requires actual entry and entrants must have had an impact on the incumbent's market position. A telecommunications market is said to have attained long-term sustainability if the benefits accrued are not diminished with the removal of regulation. This section of the review will identify the market segment(s) in which effective and sustainable competition has been achieved as well any barriers to entry which may have stymied the development of sustainable competition.

4.2 Where is competition sustainable?

Technological innovations have significantly changed the economics underlying the provision of most telecommunications services. In principle, sustainable competition is attainable in all market segments, including the provision of local access services. In a sustainable competitive market, one or more firms may possess some amount of market power, but pose no substantial risk to present and potential competition. To determine whether there is substantial competition in a market it is necessary to evaluate the structural features and trends in market segments and the behaviour of market players. Market share and concentration are only two of the factors that must be assessed to determine if there is sustainable competition in a telecommunications

market. If a market is contestable (no entry barriers) or if the market conditions change at a rapid pace, then even a market with a dominant operator may behave as if it is sustainably competitive. In a market without entry barriers the threat of entry can serve to discipline the market behaviour of dominant operators. Evidence of the development of robust wholesale markets also provides further proof that competition in the retail markets is likely to be vigorous. The best evidence of vigorous competition in retail markets however, is the existence of numerous viable market alternatives and the demonstration of consumers' ability to change service providers regularly.

Based on the definition of sustainable competition and the assessment undertaken in Chapter 2, one can conclude that the competition which has developed in the retail mobile origination market among the three facilities-based competitors is sustainable. The market is not regulated and consumers have still been able to enjoy the benefits which derived from a competitive market. Facilities-based entrants in the mobile segment have entered at the retail level and have driven down retail prices. The competition provided by these entrants has also created significant opportunities for market innovation and is characterized by increased product differentiation and ultimately higher consumer welfare. There is also sustainable competition in the international segment of the sector which is also unregulated and in which the competition between both facilities and service-based operators has resulted in a wide variety of calling options and lower prices.

The same cannot be said for the fixed access and local call segment. The local access network remains one of the least competitive segments of the liberalized telecommunications sector. This is due to the fact that facilities-based entrants in that market segment do not have wide-spread alternative infrastructure and are unable in the case of traditional technologies to match the economies of scale and scope enjoyed by the incumbent. There is also limited service-based entry in this segment. Calling card competition which is very effective in the provision of international calls has not been as effective in the provision of local calls. This is due to a difference in the calling format employed by calling card operators in each segment. Calling card operators can provide calls using two formats. In the first format, the operator buys PSTN origination from the incumbent and provides a traditional circuit-switched call using other facilities/services purchased from one or more network operators. In the second format, the

calling card operator buys PSTN origination and uses a VoIP mechanism to provide its calling services. Currently, most international calling card operators utilize the second format while their local counterparts utilize the first format. The second format is more sustainable in the long-run in that the operator relies on the incumbent only for the local call required to access the former's platform.

4.3 Barriers to Sustainable Competition

Some markets have impediments which make it impossible or more difficult for firms to enter or to compete effectively once entry has taken place. The conditions which constitute barriers to competition may be structural or strategic. Structural barriers have more to do with industry conditions such as cost and demand rather than the tactical actions taken by firms and often arise due to network effects or economies of scale. In contrast, strategic barriers are intentionally created or enhanced by dominant firms to impede entry or force firms to exit a market.

4.3.1 Structural Barriers

As was mentioned previously, competitive entry can take two forms in the telecommunications sector, facilities-based entry and service-based entry. While there is generally a preference for facilities-based entry due to its ability to facilitate innovation in the telecommunications sector, the economics of fixed line networks is such that it is unlikely to have intense infrastructure-based competition. This is particularly true in the development of last mile access networks. Companies wanting to enter the fixed segment have the option of building a duplicative local loop, but in most cases this may not be commercially feasible. Building out a duplicative local loop requires new entrants to make a very substantial sunk investment. It is therefore likely that new entrants would want to develop a subscriber base and thus a revenue stream prior to undertaking such a capital intensive undertaking.

The incumbent has a strategic advantage which is derived from the fact that it deployed its local access networks over a long period of time during which its investments were protected by exclusive rights and funded with monopoly rents. Its first mover advantage in the fixed access market has also been extended to the fixed broadband market. In fact, industry players have cited

CWJ's vast investment (in its fixed network) as one of the barriers to entry, which has resulted in the company still operating a virtual monopoly.

4.3.2 Strategic Barriers (Exclusionary Behaviour)

Under the facilities-based entry model the opportunities for a dominant carrier to stymie its rivals' entry is somewhat limited, as the entrant's network operates, to a large extent independently from that of the dominant operator's. The same is not true of service-based entry. The alternative to having one's own network is to buy access from a network operator. Buying wholesale access from an alternative to the incumbent's network may not be viable however, due to technological limitations or limited availability. Given that fixed access is a prerequisite for the provision of all other fixed-line products including ADSL services, service-based operators will be dependent on the incumbent to provide wholesale access to this vital link to consumers. It is a formidable task for a competitor to erode an incumbent's market share while at the same time having to purchase facilities from the same incumbent. It is therefore not surprising that most of the competition issues in the Jamaican telecommunications sector are linked to the underlying issue of interconnection and other forms of access and include issues of which facilities should be provided on a mandatory basis and what terms and conditions these facilities should be provided.

The rights and obligations of licensees regarding access under the Telecommunications Act differ, based on whether they are facilities-based operators (carriers) or service-based operators. In the case of facilities-based providers, the Act mandates the provision of interconnection services by all carriers and places special ex-ante obligations on a dominant provider. Service-based operators are not entitled to "interconnection" under the Act and currently, there are no ex-ante regulations governing the provision of non-interconnection forms of access. Currently, issues related to the provision of non-interconnection forms of access are addressed under the abuse of dominance provisions of the Fair Competition Act. These provisions however, require adjudication by the Commission and currently it is unable to hold Hearings. Thus, the only way that the Commission can directly intervene in access disputes is by way of negotiations.

Examples of Exclusionary Behavior in the Telecommunications Sector

Any conduct by a dominant operator to disrupt compatibility, raise its rivals' cost or reduce the quality of the service offered by its rivals is potentially anti-competitive. The competitive issues faced by operators can be placed into two broad categories: pricing issues and non-pricing issues. Pricing issues include predatory pricing, margin-squeeze, and strategic discounting. Non-pricing issues include: refusal to supply or withdrawal of a facility/service, delay in supplying or repairing facilities/services and non-price discrimination. This list is by no means exhaustive but represents the most frequently alleged anti-competitive practices related to abuse of dominance in the telecommunications industry:

PRICING ISSUES

The prevailing structure and levels of access prices in the telecommunications sector has implications for consumers and overall economic efficiency. An access price which is too high discourages service-based entry and results in high retail prices, less variety in service offerings and creates the potential for inefficient duplication of network facilities. Pricing in network industries is often controversial as in the absence of another viable alternative to the facility to which access is being sought by service providers, the dominant or monopolistic operator may be inclined to engage in anticompetitive pricing. A vertically-integrated dominant operator can use improper allocation of costs; and interference with transfer pricing, as mechanisms for disguising anti-competitive pricing.

Pricing problems in connection with service providers' access to a dominant operator's facilities will often revolve around excessive prices or a price-squeeze. Excessive pricing occurs when, the dominant upstream firm, sets the price of the input facility/service so high that the margin between wholesale and retail prices is insufficient for an equally efficient firm to profitably operate in the downstream market. A price-squeeze by a vertically-integrated firm in the provision of wholesale access is considered one of the most potent factors of market foreclosure in the provision of retail Internet and voice services. A price squeeze can take different forms. Examples of a price squeeze include:

1. the dominant network operator increasing the wholesale price relative to the retail price, thus squeezing the margin between the wholesale and retail prices;
2. the dominant network operator keeping wholesale price unchanged but reducing its retail price, which compels /induces its customer/competitor to do the same;
3. the dominant network operator introducing a new retail service at a price which is low relative to the existing wholesale service.

Price discrimination is a necessary element of both excessive pricing and a price-squeeze as the success of these practices requires that the vertically-integrated firm do not charge its own downstream operation the high wholesale price.

Strategic discounting or targeted pricing is another form of anti-competitive pricing. This is where a dominant operator offers certain subscribers a substantially better price than was previously charged or which is being offered to the other subscribers in the market, in order to keep customer loyalty and pre-empt entry. To the extent that a dominant operator can identify customers who have switched to or is being targeted by its competitors, it has an incentive to win back or win such consumers by offering a better deal. These discounts are often not based on any objective, transparent and cost-based criteria.

Several operators have commented on the pricing practices of the incumbent, both at the wholesale and the retail levels of a market. It is their opinion that the retail/wholesale rate structure implemented by CWJ has made it impossible for entrants to rationalize their pricing and has resulted in several licensees exiting the sector. The allegations are that CWJ's pricing policy is discriminatory and that the firm often increases the price of its wholesale components while reducing the price of its downstream retail service. Such a practice effectively limits the entrants' revenue generation possibilities and has an adverse effect on their ability to expand their networks and/or service offerings. One of the price-squeeze examples provided involved the Internet market in which it is alleged that in the early days of ADSL deployment, the price for CWJ's retail Internet service was lower than the total price for the wholesale components which are required to provide a competing service. Some market players also noted that the previous price cap on wholesale access and retail prices may have facilitated anti-competitive

pricing as it allowed the dominant firm to offset its rate reductions in its retail markets against increases in access markets.

NON-PRICING ISSUES

Refusal to supply or withdrawal of access

Given the importance of access to the delivery of telecommunications services a refusal to supply or a withdrawal of access can effectively foreclose access to particular service markets. One area of concern in Jamaica is the provision of direct exchange lines and toll-free numbers. The provision of calling card services and other forms of resale services require, at a minimum, the purchase of a local call or PSTN origination and PSTN termination. It has been reported that in the past CWJ has refused to supply these facilities/services and in some cases has disconnected said facilities/services on the basis that they were being used in a manner which breached CWJ's terms and conditions. Following withdrawal of the product, another product with the same functionality was offered to the access seeker at a higher price. It should be noted that allegations of refusal to supply access were not limited to the fixed network as several operators also indicated that Digicel has ignored interconnection requests from small carriers.

Inferior service quality

Quality of access which is just as vital to service-based entry as is cost-oriented pricing is also problematic.¹⁸ Even in instances in which a dominant operator has been mandated to supply a particular facility/service, it still has the ability (and incentive) to respond to the access request at a slow pace or with a lower-quality offering. Complaints have arisen over the speed at which the incumbent delivers facilities/services or makes repairs to its facilities/services which are being used by competitors to provide competing services. It is alleged that in some instances, the facility is provided but seems to be of a lower capacity than ordered, which results in the quality of the end-user service being degraded. One operator noted that having reported a fault in one of

¹⁸ In the United States, getting the incumbent to grant entrants equal access to the former's operational support functions has spawned many legal battles.

its leased lines over a year ago, the fault has yet to be corrected despite several follow-up calls and letters. The operator, who has lost some of its customers due to this fault, wants service guaranteed standards obligations to be placed on all dominant providers.

Unreasonable Terms and Conditions of Contract

It is common practice for providers of telecommunications facilities/services to include provisions in their contracts which will ensure that these facilities/services are not used improperly or for illegal purposes. Respondents to the service provider survey have expressed concern about the fact that the incumbent requires supplementary obligations which have nothing do with “proper usage” of the facilities/services which it provides. One such example is that service providers contracting for Internet DIA are prohibited from using it to provide voice services although they are licensed to provide voice services.

Non-Price Discrimination

The vertically integrated dominant provider has an incentive to favour its internal customer (its retail arm) over an external customer where these customers compete in downstream markets. One area where this has manifested in Jamaica is in the application of dialing codes. Currently, CWJ’s retail customers are required to dial +1 in order to access the network of another fixed network operator even in cases where the call is an intra-parish call. Prior to 2005, the +1 code was required when one was dialing an inter-parish number from the incumbent’s fixed network but this requirement was removed with the introduction of the single national rate. The need to dial over-ride codes to get to use the calling services of an alternative operator or to access subscribers on another fixed network can be a disincentive, thus giving the incumbent a competitive advantage over other operators. One operator also noted that consumers attempting to access its network via CWJ’s network are being charged whenever they call its toll-free line regardless of whether the call is terminated or not. The operator also pointed out that consumers do not have to pay for call origination when accessing the incumbent’s competing services. Respondents to the service provider survey have pointed out the need to mandate dialing parity, particularly with respect to dominant carriers.

CHAPTER 5: REGULATORY AND TECHNOLOGICAL SOLUTIONS

5.1 Introduction

The development of applications and solutions required to meet the needs of users in today's environment will not be possible if entry is restricted in some markets. Users should have the opportunity to obtain solutions from any supplier or mix of suppliers. This requires that service providers have the means to access and serve subscribers without any barriers. The previous sections of this paper presented both the positive and negative aspects of the Jamaican telecommunications sector. The discussion now needs to move past this point to focus on how to ensure the development of effective/sustainable competition throughout the sector. As was mentioned earlier, sustainable competition is possible only where existing and new entrants in the sector are afforded equal opportunities to compete. This fact makes wholesale markets very important during the post-liberalization period. As noted by the European Union in its 1998 Access Notice "Liberalization of the telecommunications sector will lead to the emergence of a second type of market, that of access to facilities which are currently necessary to provide these liberalized services". In Jamaica, the importance of wholesale access markets is underscored by the number of ISPs which depend on access to CWJ's infrastructure in order to participate in the Internet provision market.

The feedback from CWJ's wholesale customers raises concerns that some types of behaviour by CWJ are both anti-competitive and commonplace. Even where the individual allegations have not been proven, it is clear that the common view of these customers is that the current regulatory (ex-ante and ex-post) framework has proven ineffective in remedying the problem and has allowed CWJ to provide access to its external wholesale customers and its retail arm on different terms. In fact, one respondent noted that the vertical integration of CWJ has given it scope to discriminate in favour of its downstream business; and recommended structural separation as an appropriate remedy. The rest of the respondents considered that the competitive issues in the sector can be remedied by changes to the current regulatory framework.

5.2 Regulatory Solutions

The elimination of barriers that hinder or prevent competition must therefore be considered a high priority. The first step requires the strengthening and extension of the current ex-ante access regime to allow for an increase in service-based competition particularly in the fixed segment.

5.2.1 Strengthening and Expanding the Access Regime

In sectors such as telecommunications, an ex-ante access regime which addresses market structure issues can better limit/reduce the sources of market power and the consequent anti-competitive behaviour, rather than trying to directly regulate the behaviour which flows from its use as in the case of ex-post law. The establishment of an access regime and the subsequent “declaration of services/facilities” remove entry barriers and facilitate entry by service-based operators, thereby providing end-users with additional services. By facilitating competition in retail markets, the access obligations can improve productive and dynamic efficiency in these markets. It does this by giving service providers (both access providers and access seekers) an incentive to find cheaper ways of producing services and by encouraging investment and innovation which will ensure better quality services at lower prices. It is therefore proposed that access obligations, beyond the current interconnection requirements be placed on dominant network operators. The access obligations will provide access seekers with access to particular facilities on reasonable terms and conditions, and in doing so, place competitive pressure on CWJ, which will ensure that all operators have an incentive to price their services in a manner which reflect the most efficient use of the underlying network.

The implementation of such an access regime requires the development of a list of designated facilities/services to which these access obligations apply. One of the issues faced in the imposition of access obligations is the determination of which facilities/services should be provided on a mandatory basis. In countries such as Japan carriers with over 50% of subscriber lines are required to provide call origination and termination services to other operators. Some countries require that a dominant operator provide at minimum, access to services which competitors will need to provide any-to-any connectivity and end-to-end services. Other countries require the dominant operator to provide wholesale access parallel to all the retail

services it provides as well as offer any wholesale service for which there is a demand. It is recommended that prior to imposing mandated access for a particular service/facility, a determination should be made as to the state of competition in the market for that service with and without mandated access. Where existing market conditions already allow for the competitive supply of services the access regime should not impose mandated access. This principle recognizes primarily the cost of providing wholesale access as well as potential disincentives to investment.

The access obligations will be grounded in the “equality of access” principle.¹⁹ Equality of access requires that a dominant operator’s wholesale customers “have access to the same or a similar set of wholesale products, at the same prices and using the same or similar transactional processes” as the dominant operator’s retail arm has and does. Ofcom in its Strategic Review of Communications noted that equivalence of access has three key dimensions²⁰:

- a) Product dimension: This dimension refers to the functionality, features and the quality of the wholesale product.
- b) Price dimension: This dimension covers the charges for all the various aspects of the product.
- c) Process dimension: This dimension covers the transactional process such as forecasting, ordering and provisioning of the wholesale product. It also covers the fault repair of the product and any related systems upon which the product depends.

For an equivalent service, it would be a breach of the principle of equality if an access provider charges one access seeker, a higher direct or indirect price than the price charged to other access seekers. It would also be a breach of the principle to charge different prices for an equivalent service on the basis of use of the service. Equivalent service is being used here to mean costing the same to provide and having similar functionality. Equivalent services must be priced the same irrespective of the purpose for which it is being used or to whom it is being provided. In addition, a dominant provider must make available corresponding wholesale offerings at the

¹⁹ Equivalence models are discussed in Appendix I.

²⁰ http://www.ofcom.org.uk/consult/condocs/statement_tsr/statement.pdf

same time that it launches new retail offerings. This principle should also extend to the communication of information on the launch of new retail products. The principle of “equality of access” can be undermined by providing notice of the retail product to the general public, in advance of notice to competitors, even in cases where the wholesale product is available at the same time as the retail product. Under the equality of access principle, the access provider must also take reasonable steps to ensure that the access seeker receive, fault detection and rectification services that are equivalent to that which the access provider gives to itself.

Ideally, commercial negotiations would be the preferred method for reaching agreement on the pricing and technical issues of wholesale access. Experience has shown however, that based on the imbalance in negotiating power between a new entrant and a dominant carrier, regulatory intervention is required. As long as the level of competition in local access is insufficient to constrain pricing, the regulator should specify the pricing methodology and relevant price-setting parameters. This will serve to prevent lengthy disputes which can delay the entry of competitors at the retail level of the market. One of the challenges to implementing the equality of access principle is designing appropriate access prices due to asymmetric information and the difficulty in effectively modeling the costs of a dominant operator. Notwithstanding those issues, access prices should be based on four broad principles: 1) They should be cost-based; 2) They should not discriminate in a way which reduces efficient competition; 3) They should not be inflated so as to reduce competition in a related market; and 4) They should not be predatory.

5.2.2 Functional Separation

As noted above, there are challenges in implementing the equality of access principle. These challenges however, can be resolved by using a model which attempts to realign the interest of a dominant vertically-integrated operator such as CWJ more closely with those of the end-users. Such a model would require an extension of the current accounting separation model to create a more effective “functional (or operational) separation” of CWJ. While accounting separation may be able to deter price discrimination it is less adequate as a deterrent for the non-price types of discrimination mentioned in the previous Chapter. This is due to the fact that accounting separation does not remove the incentive for a vertically-integrated firm to discriminate against

competitors, but merely makes such discrimination more difficult. Functional separation, however, removes this incentive by making sure that decisions regarding terms of access are neutral with respect to whether the entity requiring access is a competitor or an internal division of the integrated company.

Functional separation is defined by the OECD as the “separation of different services into different divisions of the same firm, possibly with different management”.²¹ The implementation of functional separation will require that the division of the incumbent which is responsible for the sale of access to the declared services and facilities become a separate business arm from its other divisions. The functionally separate business will be obliged to strictly maintain the principle of equality of access among all its various wholesale customers (including between the company which it is part of and competing companies). Operational rules will be imposed to control the flow of information between the newly created business unit and the other arms of the incumbent and to establish new management processes and modes of corporate governance within this new business unit. For instance the operational rules should require that the new entity has a separate board and that the bonus of managers in the unit be a function of the profit made by that unit rather than by the profit made by the entire company.

5.2.3 Carrier Selection and Carrier Pre-Selection

In their response to the survey, several operators indicated that the implementation of carrier selection and carrier pre-selection is required in order to facilitate competition in the provision of fixed services. Carrier selection is a mechanism which allows subscribers directly connected to a network to proactively select (using a short dialing prefix) an alternative service provider for some voice services. Carrier Pre-Selection (CPS) is a mechanism that allows end-users to select, in advance, alternative service providers to carry their calls without having to dial a prefix or install any special equipment at their premises. Both carrier selection and pre-selection, make entry easier by reducing the need for an upfront commitment by consumers and they encourage the unbundling of telecommunications services. The experience globally with these mechanisms is that they do facilitate competition in fixed-line services. In the UK for instance, take-up of

²¹ <http://www.crf.dcita.gov.au/papers02/henderson%20dounoukis%20wijewardena.pdf>

carrier pre-selection service grew rapidly following its introduction in December 2001 and by June 2004, 12% of British Telecoms lines had carrier pre-selection.²²

5.2.4 Local Loop Unbundling

In practice, local loop unbundling (LLU) enables other suppliers of telecommunications services direct access to a network operator's lines that go into customer premises. It is seen in many countries as being necessary to stimulate competition and lower prices for residential services. Local loop unbundling can take one of three forms, based on the extent to which the various components of the local loop are unbundled. These forms are: full unbundling (*i.e.* access to raw copper); line sharing or shared access; and bit stream access unbundling (*i.e.* wholesale data spectrum access). With full unbundling the rented local loops are totally in the control of the entrant and the incumbent will not be able to simultaneously offer its services to consumers who also subscribe to the entrant's services. In the line-sharing form of local loop unbundling the incumbent and entrant utilize the same local loop. With this set-up the entrant can offer value-added services such as DSL to consumers using its own modem, while the incumbent continues to provide voice services to the same set of consumers. In the case of bit stream access, the incumbent sets up a broadband link between its local exchange and the end-user. A specified bandwidth is then allocated to the entrant for the provision of broadband services. This form of unbundling limits the possible differentiation of the ADSL service provided in competition with the incumbent and produces outcomes similar to the simple resale form of competition.

The line-sharing and/or full unbundling formats will provide the preferred benefits of increased choice and efficient supply in the delivery of enhanced telecommunications services. In the absence of line-sharing and/or full unbundling the ability of access seekers to provide services that are differentiated from those supplied by the incumbent will be inhibited. Owning their own facilities gives operators control over the operational and competitive characteristics of the services they offer and it is therefore believed that most operators will prefer to deploy their own networks where it is economically feasible. Direct access to local loop will enable entrants to bypass large sections of the incumbent's network, making the deployment of new infrastructure

²² Ofcom. (2004). Communications Market 2004 at http://www.ofcom.org.uk/research/cm/cmpdf/cmr04_print/

more economical and practical. The recommended forms of LLU allow competitors to mix their own network components with that of a dominant carrier in the most efficient manner and therefore promote quasi facilities-based competition in the interim.

As broadband speed and penetration rates increase, the use of VoIP-based calling services will become a viable alternative for local calls. The means to access local loops will also enable new entrants to emerge and offer xDSL services beyond those currently available. In the UK, Bulldog Plc. offered SDSL service, a product which British Telecom (BT) was not offering to its retail customers, while using the latter's local loop. As entrants vie to capture more customers it is expected that product innovation will extend beyond xDSL services to other value-added services such as web hosting, e-commerce billing facilities, virtual private networks, etc.

The Office has issued a consultative document on LLU to which there was lukewarm response from the Service Providers. The results of the OUR's initial investigation combined with a seeming lack of interest from affected parties and developments with respect to what seem to be alternative ways of achieving the same objectives as those provided by local loop unbundling led the Office to a decision to suspend its investigation for a twelve-month period with a view to revisiting the proposal in the latter half of fiscal year 2007/08.

5.3 Emerging Technologies and Services

There are a number of wireless technologies that have been touted as possible alternatives to the copper based access network. These include WiFi, WiMAX, and radio wireless. There is also the possibility of 3G+ mobile networks being used as wireless local loops and services based on CDMA2000 and UMTS/WCDMA have been suggested as the two main such alternatives. WiFi is short-range technology which relies on "hotspots" and uses the publicly available licence-exempt spectrum in the 2.4 GHZ band. Equipment manufacturers however, appear to be concentrating development efforts more on future devices for WiMAX and 3G mobile technologies. WiMAX is a suite of longer range technologies and is similar in architecture to mobile networks. It allows for nomadic use within the "cell" and its access speeds are comparable to design speeds of currently available ADSL technologies. Recent work on

WiMAX technology has focused on the 802.16e (mobile version) standard. The effectiveness of these types of technologies as a mass-market solution has yet to be proven.

The viability of these emerging technologies for delivering Internet and next generation services is dependent on several factors. These include regulatory, technical and commercial considerations. The technical factors which will most likely have an effect are quality of service, capacity constraints, the existence of appropriate standards and inter-operability between customer devices. In general, wireless technologies offer lower capacity and throughput speed than fixed access technologies do. At distances of over 500m, WiFi is reportedly limited to a maximum of 1Mbps. WiMAX is supposed to offer throughput speed of up to 15Mbps within 4km of the base station. In reality, this speed may lessen due to the number of served subscribers and spectrum availability. The speed of delivery by wireless technologies will also be dependent on the physical location of the antennae, atmospheric conditions such as rain, dust and smog/fog and whether or not there is maintenance of “line of sight” between receiver and transmitter. In addition, the standards governing many of the newer wireless technologies are still under development. As a result there is uncertainty with respect to which spectrum band will be “globally” adopted. This is particularly true for WiMAX. This has implications for the inter-operability of devices made by different manufacturers and the mass production of user devices which in turn have implications for the cost of user devices. The main cost elements for the wireless technologies are the cell sites. These costs include the acquisition of such sites, the construction of towers, ancillary services costs (such as power) and the cell equipment such as antennae and the other electronics.

Table 5.1: Summary of Main Industry Standards for Wireless Technologies

	<i>W-CDMA</i>	<i>HSDPA</i>	<i>WiMAX (802.16)</i>
Throughput	User speeds of up to	User speeds of around	Cell capacity of up to
	384kbit/s downstream	1Mbit/s downstream (up to 14Mbit/s in theory, but in practice likely to be smaller)	15Mbit/s in 5MHz carriers or 70Mbit/s in 20MHz carriers. User speeds likely to be smaller but 6Mbit/s per user may be feasible.
Range	Around 10km in rural areas – maybe more with external antennae	Smaller than W-DMA -typically less than 10km	Similar to W-CDMA
Spectrum requirement	Bands in the 850MHz to 2.5GHz range	Bands in the 850MHz to 2.5GHz range	Bands in the 2–11GHz range for non-line of sight coverage
Latency	250ms	150ms	Low

Source: Analysys

The HSDPA standard (an up-grade to W-CDMA) provides higher data rates than W-CDMA does but is effective over a smaller range. While HSDPA and W-CDMA may be more cost-effective for speeds that are lower than 6Mbps neither of them can compete head-to-head with a 6Mbps fibre solution. Both technologies however, give operators a viable means of capturing revenue from mobile services. WiMAX has a much greater through-put and a similar rate to WCDMA. WiMAX also has a lower latency, which allows it to deliver higher quality VoIP services. Compared to HSDPA, WiMAX has higher cell ranges and is more spectrally efficient, meaning that given equal spectrum allocation, WiMAX can deliver more bandwidth than HSDPA can without requiring additional cell sites and is therefore more cost-effective to deploy as a standalone fixed broadband solution in high demand areas. Based on these factors it is likely that WiMAX may prove to be a suitable alternative technology in the provision of fixed broadband access.

APPENDIX I: EQUIVALENCE MODELS

There are two equivalence models: equivalence of input and equivalence of outcome. The equivalence of input model ensures that the dominant operator's wholesale customers have access to the exact same set of wholesale products, at the same price and via the same transactional processes and systems as the dominant firm's retail operations. The model also increases transparency and makes it easier for the regulator to monitor for compliance. Under the equivalence of outcome model it is not required that the products that are offered to wholesale customers by a dominant access provider be identical to those which it offers to its retail arm. The products and related transactional processes can be different as long as the differences are not material enough to cause a difference in outcome. This model requires extensive monitoring in order to ensure that the provision of asymmetrical inputs for the dominant firm's downstream operations and competing downstream firms do not place the latter at a disadvantage. The regulator has to ensure that wholesale products are fit-for-purpose and that the dominant firm has not deliberately created a product whose use would likely impede the development of competition in downstream markets.

Without extensive monitoring, the equivalence of outcome approach may not resolve the equality of access problem, as differences in the transactional process can result in a significant competitive advantage. Further, under the equivalence of output model the dominant operator will not have much incentive to create fit-for-purpose products which the operator itself will not be using. The equivalence of input model is therefore preferable to the equivalence of outcome model as it creates better incentives for a dominant operator to improve its wholesale product. Based on the shortcomings of the equivalence of output model and the fact that the equivalence of input model creates the right incentives to achieve equality of access it is recommended that regulatory intervention be based on the equivalence of input model.

APPENDIX II: RESULTS OF THE CONSUMER SURVEY