Mobile Interconnection: Experience From Jamaica

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The views expressed in the paper are those of the author and should not be ascribed to the organization to which he works. Readers are invited to submit comments on all aspects of the paper and these should be sent no later than September 30, 2003 using any of the communication means cited above.

Abstract

This paper examines the regulatory regime for mobile interconnection in Jamaica. The regime which came into effect in April 2001 allows each of the three mobile operators to set their own mobile termination charges subject to a upper limit. The paper makes a number of findings. The first is that mobile d operators are able to sustain high termination charges in spite of intense competition at the retail level for subscribers. This lends support to the view that mobile operators have market power with respect to calls terminating on their networks. In light of the experience in Jamaica and other countries the paper seeks to sensitize Caribbean regulators about some of the important pricing issues and considerations involved in mobile interconnection and the imperative of giving consideration to them from the very outset.

Section 1 of the paper provides background to the liberalization process as well as trends in the mobile market, post liberalization. An overview of the legal framework governing the sector, including the broad principles relating to interconnection pricing, dispute resolution, etc are set out in section 2. Section three (3) describes the regulatory regime for mobile interconnection in Jamaica including issues having to do with cost measurement and the structure and level of charges approved by the OUR. Section four (4) provides an analysis of interconnect regime including a comparison of on-network mobile vis-à-vis off-network mobile prices. The major conclusions are presented in section 5.

1. Background

Presently there are three entities providing mobile services in Jamaica: the incumbent (Cable & Wireless Jamaica - CWJ), Digicel, and Oceanic Digital Jamaica (formerly Centennial Digital Jamaica). Digicel which commenced service at the start of the second quarter of 2001 deployed a Global System for Mobile Communications (GSM). Later that year Oceanic Digital launched service using Code Division Multiple Access (CDMA) technology. C&WJ deployed a Time Division Multiple Access (TDMA) mobile network in 1991 and has recently introduced mobile services using GSM and General Packet Radio Service (GPRS) technologies.

The mobile licences issued to the three operators have a duration of fifteen (15) years. At the same time, however, C&WJ being the incumbent operator enjoyed considerable advantage over new entrants. Firstly, while entrants were required to make payment to government, amounting to US$92.5 million, for use of scarce spectrum resources no such requirement was imposed on C&WJ. Secondly, both entrants have a license condition requiring a build out of their networks to provide 90% geographic coverage of the Island within five years. CWJ's licences contained no build out obligation. Finally, entrants were legally barred from establishing their own infrastructure for incoming and outgoing international calls. This is in keeping with the phased approach to liberalization agreed on between the GOJ and C&WJ in September 1999 which provided for CWJ to retained exclusivity on international facilities until March 2003. However, mobile entities may purchase bulk outgoing switched voice minutes from C&WJ and resell to customers.

Conditions in the telecommunications industry at the onset of liberalization[1] made for successful entry of mobile competitors. As is frequently the case in monopoly environments, consumers clamored for better service quality in terms of network coverage and service reliability, and lower prices. There were also disaffections about the lack of innovation in services and tariff offerings. This was against the background of increased fixed line penetration during the 1990s which resulted from increased capital spending aimed at modernizing and upgrading the infrastructure and expanding network coverage. Indeed, annual capital spending went from US$70 million in 1993 to more than US$100 million by 1999.. There were 471,000 fixed line customers at the end of March 1999 compared with 90,000 at the end of March '91. By March 1999 the tele-density (i.e. lines per 100 inhabitants) had grown to 18% compared with 3.6% in 1991. Figure 1 highlight trends in capital spending and fixed line connections.

[1] Liberalization commenced in March 2000 with the repeal of the 1893 Telephone Act the promulgation of a new Act and the granting of new licences to the incumbent operator, Cable & Wireless Jamaica. Mobile licences were also awarded to Mossel (Digicel) and Paradise Wireless Jamaica Limited (now Oceanic Digital Jamaica) by way of competitive auctions.

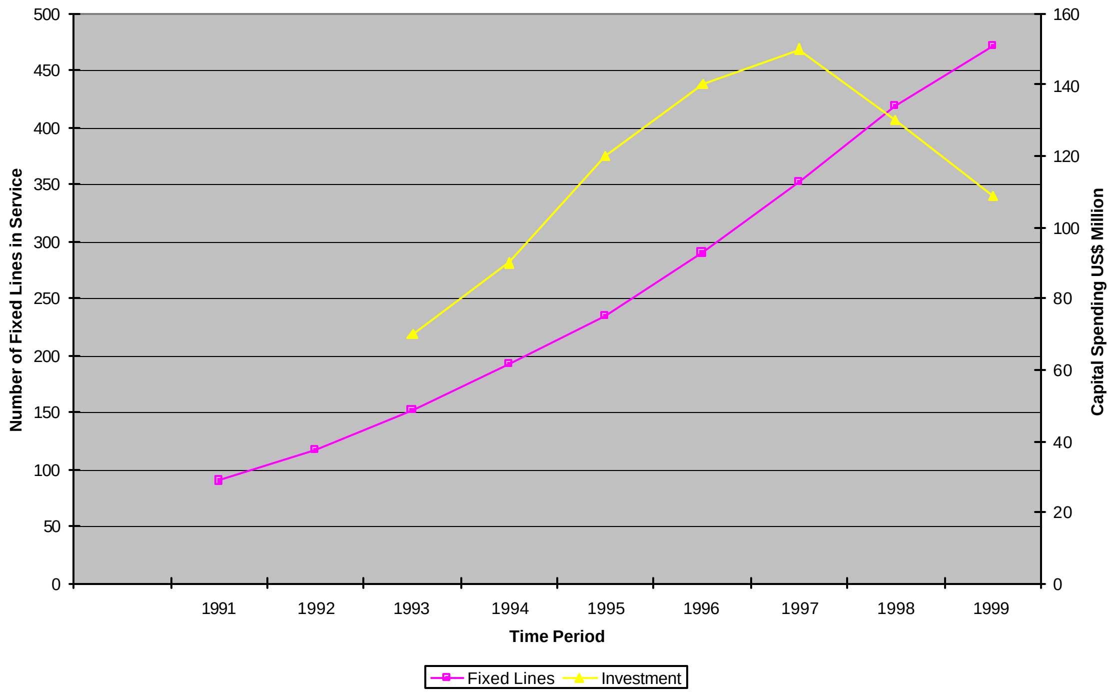


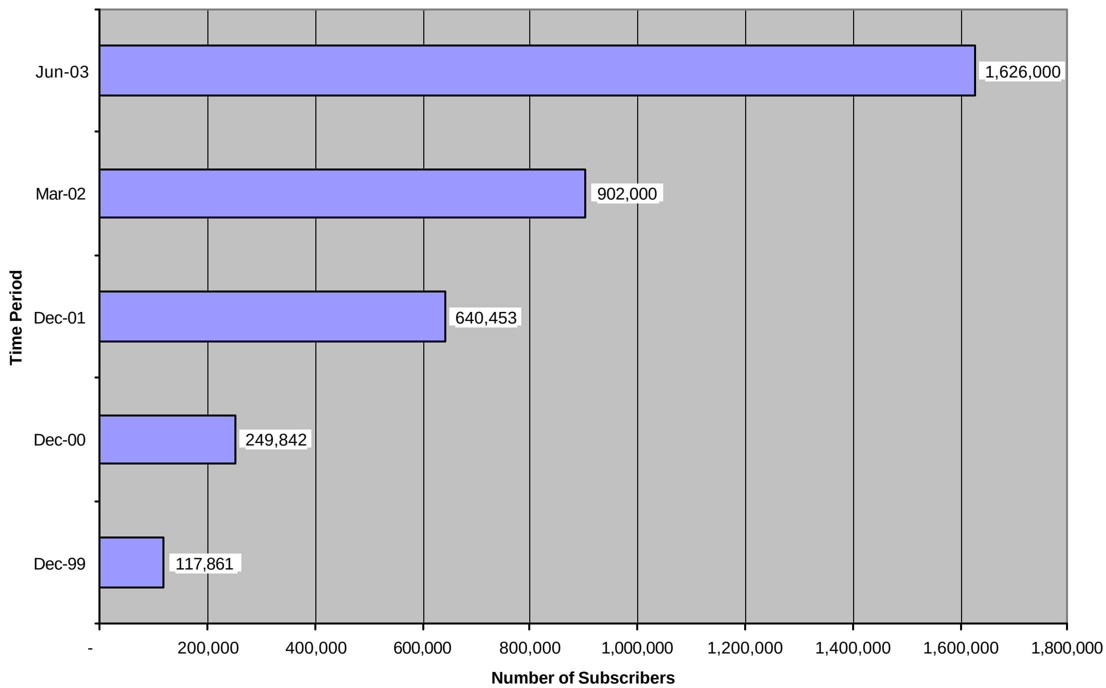
Figure 2[2] shows that the size of the mobile market has more than doubled since Digicel and Oceanic Digital commenced operations in 2001. At March 1999 there were some 79,000 mobile subscribers (3% of the population) and between 1991 and March 1999 the number of subscribers added to the mobile system each year was less than 10,000. Low network coverage, high handset prices, and the inability of consumers to meet credit requirements put a damper on demand. In the Receiving Party Pays (RPP) mobile tariff regime which existed, customers also sought to reduce the amount paid for incoming calls by turning off their handsets and or opted not to make their numbers known. For these reasons subscribers of mobile services were chiefly middle and upper income customers. Liberalization, however, has transformed the mobile market and has made services accessible to the poorest of income earners.

With competition looming CWJ switched from “Receiving Party Pays” to “Calling Party Pays” and lowered the price of mobile handsets.[3] CPP facilitates rapid growth in prepaid mobile services by eliminating the need for customers to satisfy stringent credit requirements. Additionally, customers were no longer required to pay for incoming calls and this removed the incentive for them to switch off the

[2] Source of data is the Office of Utilities Regulation.

[3] With CPP the caller pays the full cost of the call including the cost of terminating the call on the mobile network, i.e. the call recipient is not required to pay for calls received.

Throughout this paper it is assumed that US$1=J$45.76.



handset and or not disclosing their telephone numbers to a wider group of people. The looming entry of Digicel motivated the incumbent to offer enticing incentives to potential customers to lure them into signing up ahead of Digicel launch. The resulting massive over-subscription in relation to its network capacity resulted in a catastrophic collapse of its service for over three weeks. When Digicel actually launched its service and entered the market with its strategy of rapid network build out. CWJ was forced to do likewise. The net effect was a rapid expansion in mobile coverage thereby making the service accessable to a much larger segment of the population. The introduction of multi tariff offerings, and lower handset prices contributed in a big way to the growth in the size of the market. Between December 1999 and December 2000 the number of subscribers increased from 117,861 to 249,842. At December 2001 the number of mobile subscribers stood at 640,453 and presently is in the region of 1.5 million.

Another trend that has evolved post liberalization is that the number of mobile subscribers have eclipsed the number of fixed line subscribers which is estimated to be about 450, 000 as of June 2003. In fact, fixed line connections has declined by about 50, 000 since 2000.

Figure 3: Mobile Market Share (%)

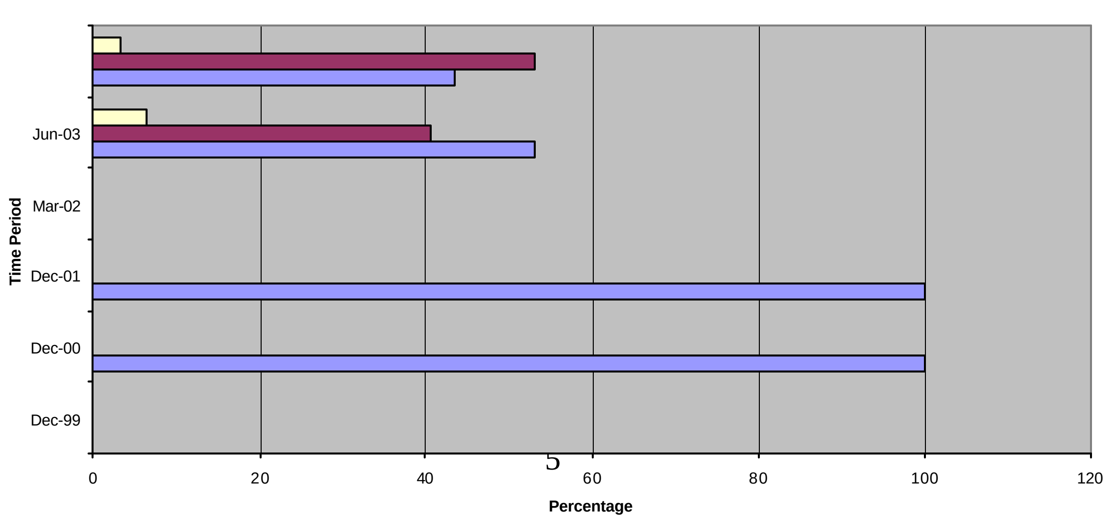


Figure 3 highlights the trends in market share during the post liberalization period. In March 2002 Digicel's share of the total mobile (902,000) stood at 40.5%, 53% for CWJ and 6.5% for Oceanic. The data for June 2003 shows that Digicel's market share is 53.19% compared with 43.24% for CWJ, thus making both companies the principal players in the market.

2. Legislative and Institutional Reforms

Underpinning the liberalization of the sector was the enactment of new legislation in the form of the Telecommunications Act, 2000, (the "Act").[4] The new legal framework transfer statutory power for the regulation of the sector from ministerial responsibility to the Office of Utilities Regulation (OUR).[5] The Fair Trading Commission (FTC) which was established under the Fair Competition Act, 1993 was to continue to play a significant role in the transformation of the telecommunications sector from monopoly to competition.[6]

The Act sets out key principles governing interconnection[7] and stipulate the role of the OUR in establishing interconnection including the resolution of pre-contract disputes. There are three ways in which the OUR may influence terms and conditions of interconnection: acting as arbitrator in the event of a dispute between the interconnection provider and the interconnection seeker during negotiations; by assessing the RIO which it may approve either in whole or in part; objection to terms and conditions in interconnection agreements.[8] The Act

[4] The Act came into effect on March 1, 2000.

[5] The OUR was established by the OUR Act, 1995 which was amended (Office of Utilities Regulation Amendment Act) in April 2000. The OUR also regulates water and sewerage, public transport (by rail, road and ferry), and electricity.

[6] The OUR is required to consult with the FTC on competition related matters and have regard to its opinion. The Act further provides for the creation of the Spectrum Management Authority (SMA), Jamaica Telecommunications Advisory Council (JTAC), and the Appeal Tribunal. SMA provides policy advice to the Minister on issues relating to spectrum management and allocation while JTAC advises the Minister on broad sector policy. The role of the Tribunal is to hear and adjudicate matters referred to it by any one who is aggrieved by a decision of the OUR. While the Act seeks to separate the role of the Minister vis-à-vis the OUR it also allows the Minister to issue policy direction of a general nature to be followed by the OUR.

[7] The principles underlying the nature and purpose of interconnection are set out in section 29 of the Act and are as follows: interconnection on request, any-to-any, end-to-end operability; and equal responsibility. Any public voice carrier has the right to request interconnection from another public voice carrier in accordance with any-to-any, end-to-end operability, and equal responsibility. Any-to-any is a necessary condition for the development of a competitive market in telecommunications. This is because it allow users of separate networks to communicate with each other or to obtain services from such other network. End-to-end operability is to allow the provision of service to consumers even where the call recipient and the calling customers are on separate networks. Equal responsibility imposes the obligation to interconnect on both the interconnecting provider and the interconnecting seeker.

imposes various obligations on a dominant public voice carrier including the requirement to file a Reference Interconnect Offer (RIO) with the OUR setting out the proposed terms and conditions upon which other carriers may interconnect with its public voice network. [9]

3. Regulatory Regime for Mobile Interconnection in Jamaica

C&WJ submitted the first version of its Reference Interconnect Offer (RIO) to the OUR in March 2000.[10] In keeping with the provisions of the Act the OUR opted to do an assessment of the RIO rather than leaving it up to the parties to negotiate terms and conditions. This was done in order to avoid undue delays and was supported by mobile entrants. The assessment of the RIO incorporated significant public consultation with stakeholders including the Fair Trading Commission (FTC). It covered a range of commercial, pricing, and technical issues relating to mobile interconnection.

By determination notice of February 2001, the OUR ruled that each mobile entrants must be physically interconnected to CWJ's fixed network. Direct connection to CWJ's mobile network was not mandated by the OUR as in the early stages of liberalization it is unlikely that the volume of traffic between mobile networks would have been sufficiently large to warrant the investment required for direct connection to mobile networks. Transit over the PSTN offers an alternative where direct connection to the incumbent's mobile network is not financially feasible. The OUR, therefore, took the position that the *any-to-any* principle could be met by calls from mobile entrants' network to the incumbent's mobile network transiting the fixed network.

Cost Measurement

The Act defines cost based as any charge for interconnection services between Total Long Run Incremental Cost (TLRIC) and Stand Alone Cost (SAC).[11] In the

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[8] Objection may arise either because the agreement is inconsistent with approved terms and conditions or is in breach of relevant principles such as the non-discrimination provision of the Act as well as provisions of the Fair Competition Act.

[9] A dominant public voice carrier shall offer interconnection to its public voice network on (i) terms and conditions that are non-discriminatory, (ii) reasonable and transparent, and there should be (iii) no unfair arrangements for cross subsidies, (iv) where "technically and economically reasonable interconnection services shall be so diversified as to render it unnecessary for an interconnection seeker to pay unreasonably for network components of facilities it does not require", and (v) charges shall be cost oriented.

[10] Access to critical areas of the incumbent's infrastructure is essential for the development of a competitive market in mobile communications. These include access to terminate calls on the fixed and mobile networks, emergency services, and national and international directory enquiries, and transit over the public switched telephone network (PSTN).

[11] The Act also stipulate that in establishing charges (i) interconnection charges shall not bear a disproportionate burden of common cost, (ii) costs shall be borne by the carrier whose activities cause those

absence of information or whether such information is unreliable the Office may resort to international benchmarks.

Developing a bottom up TLRIC model of interconnection charges was not an option given the imperative to facilitate launch of service by at least one of the new entrants. A top down model of mobile termination based on C&WJ's Fully Distributed Cost (FDC) was not possible due to the absence of data. And even if this information was available it is unlikely that mobile entrants would find them acceptable especially in light of the absence of a robust system of regulatory accounts. Additionally, Digicel and Oceanic had not yet commenced operation at the time and so the OUR would not have had the benefit of their actual experience with mobile termination charges.

The case for establishing mobile termination rates on the basis of international benchmarks was therefore strong. During the public consultation one mobile entrant urged the OUR to adopt the average CPP rates of US$0.38 (peak) per minute; and US$0.29 (off-peak) for member states of the Organization for Economic Cooperation and Development (OECD). It was further proposed that all mobile operators should be required to charge the same rates for mobile termination, i.e. a uniform termination rate.

The OECD averages did not find favour with the OUR because they were considered to be on the high side. An OECD commissioned study of *"Cellular Mobile Pricing Structures and Trends"* in member states available to the OUR at the time expressed concerns about the level of mobile charges in OECD countries and emphasized the need for regulatory scrutiny of termination rates. Moreover, even among OECD members states there were wide disparities between the rates - some countries (e.g. Norway, Denmark) had rates that were well below the OECD these averages but rates for the majority of countries were greater.[12] In the end the OUR favored a model of mobile termination developed by the UK's Monopolies and Mergers Commission (MMC) but with some adjustments to take account of differences between the UK and Jamaica, for e.g. cost of capital, scale of operations. Charges for accessing the incumbent's fixed network were established by the OUR using CWJ's Fully Distributed Cost (Table 1).

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costs to be incurred, and (iii) shall include operating expenditure and depreciation and should be set at such levels as to give the carrier an opportunity to earn a reasonable rate of return. Charges for interconnection may also include provision for a supplementary charge, being a contribution towards the access deficit of the interconnection provider. In determining an operator's call termination charges the OUR "……shall have regard to the principle of cost orientation, so, however, that if the operator is non-dominant then the Office may also consider reciprocity and other approaches." Reciprocity is defined as "basing the non-dominant carrier's call termination charges on the call termination charges of another carrier's.

[12] Belgium, France, Czech Republic, Germany, Greece, New Zealand, Poland, Portugal, and Turkey.

Table 1: Cost Standards for Mobile Interconnection

Services	*Cost Standard*
Fixed Retention	MMC Benchmark
Mobile Termination	MMC Benchmark
PSTN Transit	FDC –current cost
Fixed Termination	FDC – current cost
Emergency Services	FDC – current cost
National & International DQ services	FDC – current cost
Other Special Access Services	FDC – current cost

Structure and Level of Interconnect Charges
The regime for the following call types: fixed to mobile, mobile to fixed, and mobile-to-mobile as well as the charges approved by the OUR are discussed below.

(i) Fixed to Mobile Interconnection
Table 2 sets out the termination rates derived from the adjusted MMC model. These rates, along with others, were determined in February 2001[13] and were to be the subject of a review based on actual Jamaican experience.

Table 2: Maximum Mobile Termination Charges (US$)

		Units	*Peak*	*Off-Peak*	*Weekend*
Regional	Call setup	Per call			
	Duration	Per minute	0.2262	0.2262	0.2263
National	Call setup	Per call			
	Duration	Per minute	0.2261	0.2262	0.2262

Table 3: Fixed Retention (US$)

		Units	*Peak*	*Off-Peak*	*Weekend*
Regional	Call setup	per call	0.0090	0.0063	0.0046
	Duration	per minute	0.0316	0.0295	0.0281
National	Call setup	per call	0.0136	0.0095	0.0068
	Duration	per minute	0.0378	0.0338	0.0312

The CPP rates for fixed to mobile calls include a fixed sum (fixed retention) to be retained by the fixed network operator. The sums for fixed retention are given in Table 2 and so combining the respective sums in Tables 2 and 3 yield the CPP rates for fixed to mobile calls given in Table 4.

Even with the adjustments made to the MMC model the OUR still had reservations about the level of charges. This stemmed from awareness of the growing evidence in CPP jurisdictions that mobile termination is an essential

[13] Cable & Wireless Jamaica's Reference Interconnect Offer, Determination Notice, Office of Utilities Regulation, http://.www.our.org.jm.

facility and thus mobile entrants have the power to set excessive charges to terminate calls on their networks.

Table 4: Maximum CPP Rates for Fixed to Mobile Calls (US$)

		Units	Peak	Off-Peak	Weekend
Regional	Call Setup	per call	0.0090	0.0063	0.0046
	Duration	per minute	0.2579	0.2557	0.2544
National	Call Setup	per call	0.0136	0.0095	0.0068
	Duration	per minute	0.2640	0.2601	0.2574

Support for a uniform rate for mobile termination did not find favour among all operators. It was argued that a uniform regime would remove pricing flexibility since entrants may wish to vary the amount charge for termination. For reasons related to an overlap from the previous rate of return regime CWJ could not adjust its fixed to mobile rates (US$0.1093, $0.0874, and $0.0656). until September 2001.[14] Given all of the above, the OUR allowed each mobile entrant to set its own termination rate but mandated an upper limit (Table 2). Moreover, the regime effectively regulate fixed to mobile termination for all three mobile operators.[15]

Mobile to Fixed Interconnection

Table 5 contains the OUR approved charges payable by mobile operators for terminating calls on CWJ's fixed network. The reasonableness of the costing data underpinning these rates were ascertained using international benchmarks. A comparison of Tables 2 and 5 shows that the cost of terminating a call on a fixed network is much lower than terminating on a mobile network.

Table 5: Fixed Termination (US$)

		Units	*Peak*	*Off-Peak*	*Weekend*
Regional	Call setup	Per call	0.0091	0.0063	0.0045
	Duration	Per minute	0.0116	0.0095	0.0082
National	Call Setup	Per call	0.0136	0.0095	0.0068
	Duration	Per minute	0.0179	0.0139	0.0113

(ii) Mobile-to-Mobile Interconnection

Termination charges for off-network mobile-to-mobile calls were to be negotiated by the parties. These are calls originating and terminating on separate mobile

[14] This was about four later than Digicel's planned launch date.

[15] The OUR has only recently made a declaration of dominance in the fixed telephony market. No declaration of dominance has been made with regard to the mobile telephony market. The OUR took the view, however, that it has power to regulate mobile termination given its wider statutory power to regulate the telecommunications sector and in so doing to have regard to the interests of customers, carriers, and service providers. This interpretation is now the subject of court proceedings and a decision is pending.

networks. For e.g. a call which originates on CWJ's mobile network but terminates on Digicel or Oceanic's network. The OUR mandated, however, that each mobile operator should receive the same amount for termination as it has to pay to the operator on whose mobile network the call originates.

On November 22, 2001 the OUR announced upward adjustments in the following rates: the maximum mobile termination charge (Table 6), fixed retention (Table 7), and the maximum CPP for fixed to mobile calls (Table 8). Another adjustment to the regime was the removal of the cap on the CPP rates for calls originating on CWJ's fixed and terminating on CWJ's mobile. This allowed CWJ the freedom of increasing the CPP rates up to the maximum levels in Table 8. However, to minimize the scope for predatory behavior CWJ could charge no less than the rates existing previously.[16]

Table 6: New Maximum Mobile Termination Rates (US$)

		Units	Peak	Off-Peak	Weekend
Regional	Call Setup	per call			
	Duration	per minute	0.2262	0.2262	0.2263
National	Call Setup	per call			
	Duration	per minute	0.2243	0.2262	0.2262

Table 7: New Fixed Retention Rates (US$)

		Units	Peak	Off-Peak	Weekend
Regional	Call Setup	per call	0.0098	0.0069	0.0050
	Duration	per minute	0.0541	0.0517	0.0502
National	Call Setup	per call	0.0148	0.0103	0.0074
	Duration	per minute	0.0608	0.0564	0.0536

Table 8: New Maximum CPP Rates for Fixed to Mobile Calls (US$)

		Units	Peak	Off-Peak	Weekend
Regional	Call Setup	per call	0.0098	0.0069	0.0050
	Duration	per minute	0.2803	0.2779	0.2765
National	Call Setup	per call	0.0148	0.0103	0.0074
	Duration	per minute	0.2851	0.2827	0.2798

4. Analysis of Mobile Pricing Regime

Fixed to mobile Calls

Several observations may be made from the data cited in Tables 9, 10 and 11. Table 9 lists each mobile operator's CPP rates during the period April 2001 - June 2003. Given the fixed retention in Table 7 and the prepaid CPP rates at June 2003 the mobile termination by each operator is approximated (Table 10).

[16] All other charges set out in the February 2001 determination notice was unaffected by the November determination.

Table 11 shows termination as a percentage of the CPP for each mobile operator.

Table 9: Retail Rates for (Prepaid) Fixed to Mobile Calls US$ per minute

Mobile Operator	*Date*	*Peak*	*Off-Peak*	*Weekend*
CWJ	April 2001	0.1093	0.0874	0.0656
Digicel		0.2622	0.2404	0.2404
Oceanic Digital		n/a	n/a	n/a
CWJ	November 2001	0.1530	0.1530	0.1530
Digicel		0.2622	0.2404	0.2404
Oceanic Digital		0.1530	0.1530	0.1530
CWJ	***June 2003***	***0.1530***	***0.1530***	***0.1530***
Digicel		***0.2622***	***0.2404***	***0.2404***
Oceanic Digital Jamaica		***0.1967***	***0.1967***	***0.1967***

Table 10: Mobile Termination US$ per Minute (Approximation)

	Regional			National		
	Peak	Off-Peak	Weekend	Peak	Off-Peak	Weekend
Digicel	0.2082	0.1887	0.1902	0.2014	0.1840	0.1868
Oceanic Digital	0.0989	0.1012	0.1028	0.0922	0.1868	0.0994
CWJ Mobile	0.1426	0.1450	0.1465	0.1359	0.1402	0.1431

The first observation is that liberalization of the mobile sector was accompanied by increases in fixed to mobile charges. In April 2001 CWJ rates for fixed to mobile calls were: US$0.1093 (peak), US$0.0874 (off-peak), and US$0.0656 (weekend). When Digicel launched service (April 2001) it sets the CPP rates for fixed to mobile calls at US$0.2622 (peak), US$0.2404 (off-peak), and US$0.2404 (weekend). Following the November determination CWJ increased its fixed to mobile charges to a flat charge of US$0.1530 per minute. Oceanic which launched service (limited to the Kingston Metropolitan Area and its vicinity) in that same month set its fixed to mobile charges at a flat rate of US$0.1530 per minute. No adjustment was made to Digicel's rates. For fixed subscribers, calls to mobile are by far the most expensive of domestic calls and even if domestic toll and long distance are fully rebalanced they would still be below the fixed to mobile charges obtaining in the market (Appendix 1).

Table 11: Mobile Termination as a % of Retail Charges

	Regional			National		
	Peak	Off-Peak	Weekend	Peak	Off-Peak	Weekend
CWJ Fixed to Digicel	79.38	78.48	79.11	76.81	76.52	77.71
CWJ Fixed to Oceanic	72.52	73.70	74.47	69.08	71.31	72.71
CWJ Fixed to CWJ Mobile	64.66	66.19	67.18	60.24	63.11	64.97

Secondly, indications are that high fixed to mobile charges have impose a significant financial burden on fixed line subscribers. Indeed, many fixed line subscribers have experienced severe bad debt problems and have had to give up their fixed lines. It is never clear cut as to reason why a customer may refuse to pay his or her telephone bill. A fixed to mobile customer consume a combination of calls some of which are price low while others are price high, some calls are from fixed to competitors mobile network, some are fixed to fixed calls.

Thirdly, although the level of charges vary from operator to operator, the differences between them are worthwhile noting. Digicel's peak rate for example was 1.7 times that of CWJ and 1.3 times Oceanic's. Newspaper reports as well as enquiries to OUR's Customer Affairs Department indicate that customers blame CWJ for the levels of charges for calls from its fixed network to mobile networks and in some instances the company was even accused of price gouging. Obviously consumers were unaware that the regime allows each mobile operator to set charges for fixed to mobile calls. The lesson here is that a CPP regime in which mobile carriers set fixed to mobile prices could pose severe marketing difficulties for the fixed network operator.

The data also show that mobile termination constitute a large share of fixed to mobile rates. Mobile termination as a percentage of the CPP vary from operator to operator, and increases in the level of termination charged by an operator translates into higher charges for fixed line subscribers. The level of termination set by all operators was more than 60% of the CPP (Table 11).[17] Note the wide disparity in the level of termination charges set by each mobile operator. Given this disparity it is unlikely that charges set by operators approximate the true economic cost of mobile termination.

Fifthly, the high fixed to mobile charges did not in any way affect mobile operators' ability to attract and retain customers as the charges were paid by fixed line subscribers. Indeed, both Digicel and CWJ experienced rapid growth in

[17] In a recent survey of the mobile industry OVUM reported that revenues from termination constitute roughly 25 percent of overall revenues for most operators with calling party pays system.

mobile subscribership with Digicel experiencing a faster rate of growth than CWJ; this despite the fact that its termination was the highest. Digicel has been the more aggressive of the three operators, pursuing a strategy of rapid network expansion into major towns and rural communities, which in some instances might not have been previously served by the incumbent's fixed or mobile networks. At the time at launch Oceanic offered limited network coverage for Kingston and surrounding environs. This constrained the availability of its services and, by extension, the attractiveness of its products to a wider cross-section of customers. Hence, in spite of intense competition among mobile operators for subscribers, mobile operators are able to sustain their termination charges and this lends support to the view that termination is an interconnect service that is not subject to competitive pressure.

An interesting observation in this regard is made by the UK Competition Commission Report (January 2003) on termination charges by the four major UK mobile companies. The Report states *inter alia* that each of the four operators (T-Mobile, Vodafone, Orange PCS, and One2One):[18]

"……has a monopoly of call termination on its own network. This is because there are currently no practical technological means of terminating a call other than on the network of the MNO to which the called party subscribes and none that seems likely to become commercially viable in the near future. There are also no ready substitutes for calling a mobile phone at the retail level, such as calling a fixed line instead.".

Under CPP mobile operators are able to set higher charges for calls made by customers connected to other networks without fear of losing market share. Under RPP charges for call termination can be constrained by competition because charges for both incoming and outgoing calls are paid by the same individual who chooses the network operator, and therefore has the ability to switch to a different operator to obtain better rates. In order to attract customers to their networks the tendency is for mobile operator to l charge lower prices for usage and handset and recoup and higher charges for calls to competing operators. This is referred to as the "waterbed effect". If the waterbed is high in one area (eg fixed to mobile termination) it must be lower in some other area (eg handset prices and usage). The downside to this practice is that competition is distorted in both the fixed and mobile markets. It is also likely to lead to the transfer of welfare from one group of customers (e.g. fixed subscribers) to another (mobile).

[18] In this Report the CC proposed tough price controls on mobile operators: a one-off cut of 15% followed by 3 years of RPI-15% for Vodafone and O2 and RPI-14% for Orange and T-Mobile. Copies of the CC Report are available at http://www.oftel.gov.uk. The current practice in many CPP jurisdictions is towards regulating mobile termination, e.g. UK, Netherlands, South Korea, France, Belgium, Spain, Switzerland, Austria, and Italy.

In May 2002 the OUR announced new mobile termination rates of: US$0.1438 (peak), US$0.1176 (off-peak) and US$0.0914 (weekend). These rates are below the earlier rates set by the OUR and provides further evidence that termination charges are not cost based. These rates were derived following a period of public consultation and based on CWJ's cost of mobile termination and included a spectrum surcharge to take account of the fact that Digicel and Oceanic, unlike CWJ were required to pay spectrum cost amounting to US$92.5 million.[19]

Mobile to Fixed Calls

The rates for mobile to fixed calls are set by mobile operator (Table 12). Each mobile operator is required to remit the OUR's approved fixed termination charges set out in Table 7 to the fixed network operator. Fixed termination accounts for less than 10% (Table 13) of the retail price for mobile to fixed calls and is several times less than mobile termination. It is unlikely that mobile termination that is cost based can be substantially greater than fixed termination rates that are cost based. Even if one assumes the cost of terminating on a fixed network is lower than on a mobile network, the observed differences between fixed and mobile termination cannot be attributed solely to cost differentials and contradicts the claim that wireless network costs and fixed network costs are converging.

Table 12: Mobile to Fixed Retail Rates, US$ per Minute

	Peak	Off-Peak	Weekend
Digicel to CWJ Fixed	0.2622	0.2185	0.2185
Oceanic Digital to CWJ Fixed	0.1967	0.1967	0.1967
CWJ Mobile to CWJ Fixed	0.2185	0.2185	0.2185

Table 13: Fixed Termination as a % of Retail Price

	Regional			National		
	Peak	Off-Peak	Weekend	Peak	Off-Peak	Weekend
Digicel to CWJ Fixed	4.44	4.37	3.73	6.83	6.35	5.15
Oceanic to CWJ Fixed	5.92	4.86	4.14	9.10	7.10	5.70
CWJ Mobile to CWJ Fixed	5.33	4.37	3.73	8.20	6.35	5.15

Mobile to Mobile Calls

This section presents an analysis of charges for calls originating and terminating on the same mobile network (on-net), for e.g. C&WJ Mobile? C&WJ Mobile; and

[19] The decision did not take effect, however, due to court proceedings initiated by one mobile entrant. The Court's decision is still pending. In the meantime new retail rate (US$0.1472 per minute) for calls from CWJ fixed to Digicel Mobile became effective on September.

mobile to mobile off-network charges, i.e. charges paid by retail customers for calls originating and terminating on a different mobile network. Table 14 shows that on-net mobile charges are lower than off-net mobile charges. On-net charges are also lower that fixed to mobile and mobile to fixed. This is not in itself a surprise given that off-net calls involves two networks. What is at issue is the magnitude of the differences which does not seem to be explained by cost differentials.

All three mobile operators off lower on-net mobile charges than off-net mobile charges. This observation is made in many other CPP jurisdictions and is not surprising since the objective of mobile operators is to attract and maintain subscribers to their networks. The difference between on-net and off-net charges is due in part to the fact that off-net calls attract higher termination charge than on-net calls.

Table 14: On-Network and Off-Network Mobile (Prepaid) Retail Charges

Call Types	Peak US$ per minute	Off-Peak US$ per minute	Weekend US$ per minute
On-Network			
CWJ Mobile to CWJ Mobile	0.2185	0.1530	0.1530
Digicel to Digicel	0.2185	0.1748	0.1748
Oceanic to Oceanic	0.0874	0.0874	0.0874
Off-Network			
CWJ Mobile to Digicel	0.3868	0.3453	0.3497
CWJ Mobile to Oceanic	0.3868	0.3457	0.3497
Digicel to CWJ	0.3868	0.3453	0.3497
Digicel to Oceanic	0.3868	0.3453	0.3497
Oceanic to CWJ	0.3278	0.3278	0.3278
Oceanic to Digicel	0.3278	0.3278	0.3278

5. Conclusion

The mobile market in Jamaica has experienced exponential growth since liberalization and CWJ is no longer the leading supplier of mobile services - that position is now occupied by Digicel. A major contributing factor to this growth is consumers favorable response to CPP. Other factors are the rapid network expansion by CWJ and Digicel and falling handset prices and greater pricing options. The Jamaican case also reflects a situation where there was an aggressive new entrant which took advantage of a large unmet and underestimated pent-up demand for mobile service and competed successfully against a weak incumbent and other struggling new entrants

The Jamaican experience highlights some of the challenges faced by a nascent regulatory institution in its efforts to establish a fair and pro-competitive regime for mobile interconnection. A number of factors need to be considered in establishing an interconnection regime. These include, appropriate benchmarking in the absence of TLRIC and or credible FDC costing data, and whether to regulate mobile termination on the onset of liberalization or to delay such regulation until a declaration of dominance is made. Delays in establishing constraints on termination may act to the detriment of fixed line subscribers who must call mobile subscribers and distort competition in the marketplace.

Mobile termination is a major factor impacting on fixed to mobile charges. In the case of Jamaica mobile termination account for more than 60% of CPP. Even if allowance is made for cost difference between networks it is unlikely that the cost of terminating on a mobile network is several time higher than the cost of terminating on the fixed network.

The Jamaican experience shows that termination is sticky downward even where there is intense competition for subscribers at the retail level. Many analysts fail to make a distinction between retail and interconnect markets and thus equate competition for retail customers as evidence that there is competitive pressure throughout the value chain including termination. This is certainly not the case and hence recent moves in many CPP jurisdictions to regulate termination. Given that two mobile operators have experienced rapid growth in subscribership even with termination rates which the OUR demonstrated are above costs prove that competition at the retail level does not exert much downward pressure on termination rates.

A review of the fixed to mobile termination charges in Jamaica which were based on benchmarks shows that such charges are in excess of costs. Benchmarking is extremely difficult but for most regional regulators this might be the most speedy method of establishing termination charges. However, given the likelihood that benchmarks might not approximate the true cost of termination, provisions should be made for periodic reviews. These conclusions are consistent with the experience in other CPP countries and support the need for mobile operators to be constrained in terms of charges.

An interesting addendum to this paper is that Digicel has lowered its fixed to mobile charges effective September 1, 2003. has also adjusted its rates to be slightly less than those of Digicel. Digicel’s new is US$0.1472 per minute and approximate to a peak termination charges (assuming existing retention) of US$0.952 (Regional), and US$0.0882 (National). These termination rates are below the lowest rate (US$0.0914) set out in the May 2002 determination.

Appendix 1: Fixed to Fixed Retail Rates, US$ per minute or part thereof (June 2003)*

		Peak	*Off-Peak*	*Weekend*
Standard	Intra-Parish	0.009	0.008	0.007
	Inter-Parish	0.023	0.021	0.014
Low User Package	Intra-Parish	0.013	0.011	0.009
	Inter-Parish	0.035	0.031	0.021
Toll Free	Intra-Parish	0.013	0.011	0.009
	Inter-Parish	0.035	0.031	0.021
World Talk	Intra-Parish	0.033	0.027	0.022
	Inter-Parish	0.052	0.042	0.031

* US$1=J$45.76

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