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# Economic Analysis (Mobile Market Wireless Study)

**Final Report**

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# An Economic Analysis of the Jordanian Mobile Telecommunications Market

## I. Executive Summary

This study examines the degree of competition that currently exists in the Jordanian mobile telecommunications market. Some studies have concluded that the growth of the penetration rate for mobile services in Jordan indicates that the market is competitive. This report challenges that conclusion, particularly as many monopolies have higher penetration rates, and examines various indicators that measure the competitiveness of the mobile market. The overall finding is that the current market is not strongly competitive and, in fact, exhibits less intense competition than other mobile duopolies.

A comparative analysis demonstrates that prices for mobile services in Jordan for both pre-paid and post-paid services are higher than those in comparable countries. Related to this, usage of the networks by average subscribers - a key indicator of consumer welfare, is lower than would be expected for the Jordanian market.

Economic measurement of the concentration in the market indicates that there is a very high degree of concentration so that the intensity of competition is relatively low when compared to other mobile duopolies. This concentration is a significant factor in preventing competitive forces from generating the conditions of static efficiency, which is the relation of prices of services to the costs of production, and dynamic efficiency, reflected by the rate of technological innovation, that occur in a truly competitive situation.

Given this state of play, the introduction into the market of an additional mobile operator will benefit users and support innovation.

The report concludes by proposing regulatory policies that the TRC could implement in order to assist the rapid and sustainable development of enhanced competition.

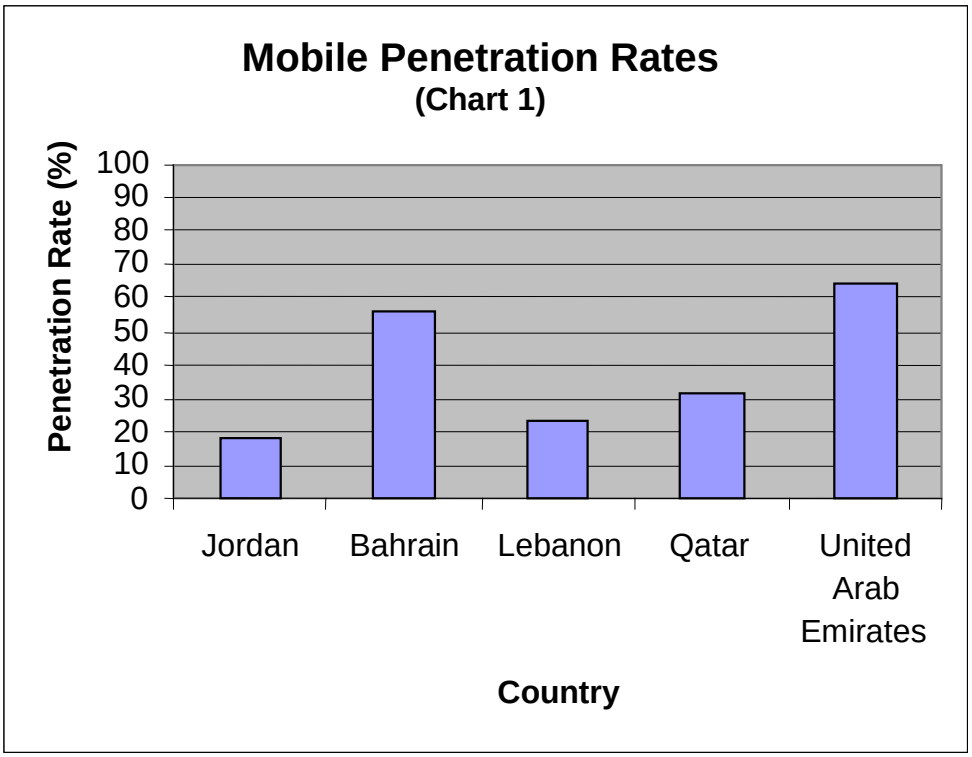
## II. The Current Mobile Market

There are two operators providing cellular service – Fastlink and MobileCom. A GMPCS provider, Middle East Communications, uses the Thurya satellite system to provide international mobile service to a small number (less than 300) of Jordanian users and a new licensee for trunk radio service, New Generation, will initiate Xpress service (push-to-talk) in April of 2004 on its own network.

Service is almost exclusively voice with minimal GPRS take-up by subscribers.

With the relatively recent licensing of MobileCom in 2000, the Jordanian subscribership and penetration rate for mobile services has increased substantially. In 1997, there were only 45,000 mobile subscribers in Jordan; however, by first quarter 2003, the number of mobile subscribers reached 1.2 million with an 18 percent penetration rate. Although there has been significant growth, the increase in number of subscribers is not necessarily an indication of robust competition in the mobile market. Rather, it is more likely to represent the fact that network industries generate substantial "consumer externalities" in their early development so that growth of users on the network makes participation more attractive to additional users. This phenomenon is captured by Metcalf's Law, which states that the value of a network (to marginal users) grows exponentially to the size of the network.

In 2002, the penetration rate in Bahrain, which has a monopoly mobile provider, was 56 percent while Lebanon was at a penetration rate of 22.7 percent (even though the ongoing regulatory turmoil in Lebanon has essentially stopped mobile growth for the last two years). Two other countries in the region with monopoly providers, Qatar and the United Arab Emirates, also have higher mobile penetration rates of 31 percent and 64 percent respectively. Accordingly, the growth in the Jordanian market cannot be used to argue that strong competitive forces necessarily exist.



# III. The Significance of Competition

The mobile telecommunications market in Jordan has the potential to spur economic activity, especially among small and medium enterprises, by providing an office-on-the-move, enhancing communications among consumers and being a vehicle for the introduction of data services to support Internet access and over time broadband availability. For this to occur, however, services need to be provided in a manner such that prices and services are available that permit high use and continually more advanced capabilities. This desired outcome requires a sustainable and strongly competitive mobile market in Jordan.

This Report considers the performance of the current duopoly market structure in Jordan and what benefits, if any, would result from opening the market to additional operators.

An examination of ITU and commercial databases, such as EMC, finds that there is little mobile usage data available generally – none for Arab countries.

This lack of detailed, comparable data for the region has necessitated drawing upon other countries – such as Ireland where comprehensive data exists in a country with many attributes similar to Jordan – to complement the fragmented regional data that is available. This Report also considers peripherally some issues where there is a spillover from the mobile sector to the fixed line services of Jordan Telecommunications.

Indicators of Competition

As noted above, the growth in mobile penetration rate does not provide conclusive evidence of the nature and degree of competition in a market. This analysis examines the level of competition that exists in Jordan's current duopoly, noting that not even all duopolies demonstrate the same degree of competitiveness. Competition is important as it generates both static and dynamic efficiency in the market place. Static efficiency is indicated by consumer prices that are related to the cost of providing service, often termed 'cost-based' prices. Dynamic efficiency is manifested in the rate of technological innovation – for mobile services this would be demonstrated by the introduction of various network features and high quality data transmission.

There are a number of indicators that can be used to measure the degree and scope of competition in the mobile market. The first is an examination of market prices, particularly in comparison to other markets. Average subscriber usage of the mobile network is another useful indicator for gauging the level of competition. Consumer use is particularly important as a measure of consumer welfare. Many economic studies indicate a price elasticity of demand greater than one, meaning that price reductions generate a greater than proportionate increase in usage. In contrast, market power is normally exerted in a manner to restrict output or supply (through charging relatively high prices). Accordingly, subscriber usage can provide a great deal of insight into the competitiveness of the market.

There are two dimensions to pricing and usage in the mobile market. First is the monthly subscription charge for postpaid services and the number of consumers that have subscribed to this service, the take-up rate. Second is the per minute charge (the marginal price), which is a variable that has a direct impact on the usage of the mobile service. Both variables affect consumer use of the network and connectivity.

This report provides a comparative analysis on the basis of currently available, albeit limited comparative data. This data, along with supplemental information from a case study on Ireland and further economic measurements of concentration, is sufficient to provide a basis for drawing conclusions in the Jordanian market.

The specific measurement of market concentration is an additional indicator that provides further insight into market dynamics. The degree of competitiveness (or inversely the market power that exists), is commonly measured using the Hirfandahl – Hirschman Index (HHI). The HHI is calculated as the sum of the squares of the market shares of operators and has a maximum value of 10,000 – for a monopolist with 100 percent market share – and a limiting value of 0 – for atomistic, perfect competition. The U.S. Department of Justice Antitrust Division as well as the standard literature related to Industrial Organization utilizes thresholds of:

- an HHI of under 1,000 indicates a fully competitive market
- an HHI between 1,000 and 1,800 indicates a reasonably competitive market, and
- an HHI over 1,800 indicates some concentration that increases as the index rises towards a maximum value of 10,000.

At levels above 1,800, a comparative analysis with a difference of 100 points or more represents a measurable and statistically significant difference in the degree of market power.

## IV. Analysis of Jordan's Mobile Market

By using the indicators described above, there is evidence that the Jordanian market is not competitive, not even for a duopoly, and that the Jordanian mobile market exhibits characteristics more in line with 'monopolistic competition,' often called 'price leadership.' An examination of prices, compared to regional carriers and U.S. operators, demonstrates significantly higher prices per minute of use than in the baseline countries.

The following charts provide some comparative data on prices for both prepaid services (Chart 2) and postpaid 'buckets of minutes' in which a consumer pays a fixed monthly charge for a preset amount of minutes (Chart 3). Any use above the preset amount incurs a significant penalty in the form of a high per minute charge.

The prices in Chart 2 for Fastlink and MobileCom are weighted averages of the prices for the predominant pre-paid services. As can be seen, weighted averages of prepaid services for both Fastlink and MobileCom exceed comparable rates in both Lebanon and

Bahrain. It can also be seen that the penetration rate for mobile service for those countries exceeds that of Jordan.

**Comparative Mobile Prepaid Tariffs**
**(Chart 2)**

| Country | Penetration | Providers | Per Minute (US Cents) |
|---|---|---|---|
| Jordan | 18.5% | Duopoly | MC: 20.4<br>FL: 14.8 |
| Lebanon | 22.7% | Duopoly | 12.4 |
| Bahrain | 58.3% | Monopoly | 11.9 |

There is a comparable pattern when considering the 'bucket' programs against those available in the United States. The implicit per minute rate available to Jordanian consumers of over $0.17 greatly exceeds that available to American consumers, particularly when the very high amount of usage for off-peak periods (nights and weekends) is considered. As the chart demonstrates, some U.S. carriers offer 5,000 minutes of 'free' off-peak traffic and some actually offer unlimited off-peak traffic. In addition, these tariff packages charge base rates for peak use per minute that is below that of Jordanian carriers and include national long distance as part of the basic service.

**Buckets of Minutes - Representative**
**(Chart 3)**

| Company | Minutes | Monthly Fee (US$) | Implicit Cost/Minute (US$) |
|---|---|---|---|
| Fastlink | 200 | 35 | 0.175 |
| MobileCom | 180 | 31 | 0.172 |
| Fastlink | 1000 | 108 | 0.108 |
| MobileCom | 990 | 107 | 0.108 |
| Cingular | 400 anytime<br>5000 night/weekend | 40 | 0.10 plus n/w |
| AT&T Wireless | 1,100 anytime<br>Unlimited nights/weekend | 76 | 0.069 plus n/w |

Given these indicative tariff packages, the relatively low use of mobile services – as measured by minutes per month – is predictable and in line with the economic studies that demonstrate a price elastic demand for telecommunications services. One of the few pieces of information on mobile use per month per subscriber comes from Professor Jaoud at the Lebanese American University. The relatively high average subscriber use

in Lebanon of 750 minutes per month greatly exceeds that of Jordanian users and indicates that networks are not being utilized to full capability. Professor Jaoud notes that use of mobile communications in Lebanon is just behind Singapore, Hong Kong and Ireland.

In contrast to average subscriber use in Lebanon, MobileCom has provided data indicating that its average subscriber use in 2002 was 227 minutes per month (158 for post paid customers) and Fastlink has documented average subscriber use of 119 minutes per month (281 for post paid customers).

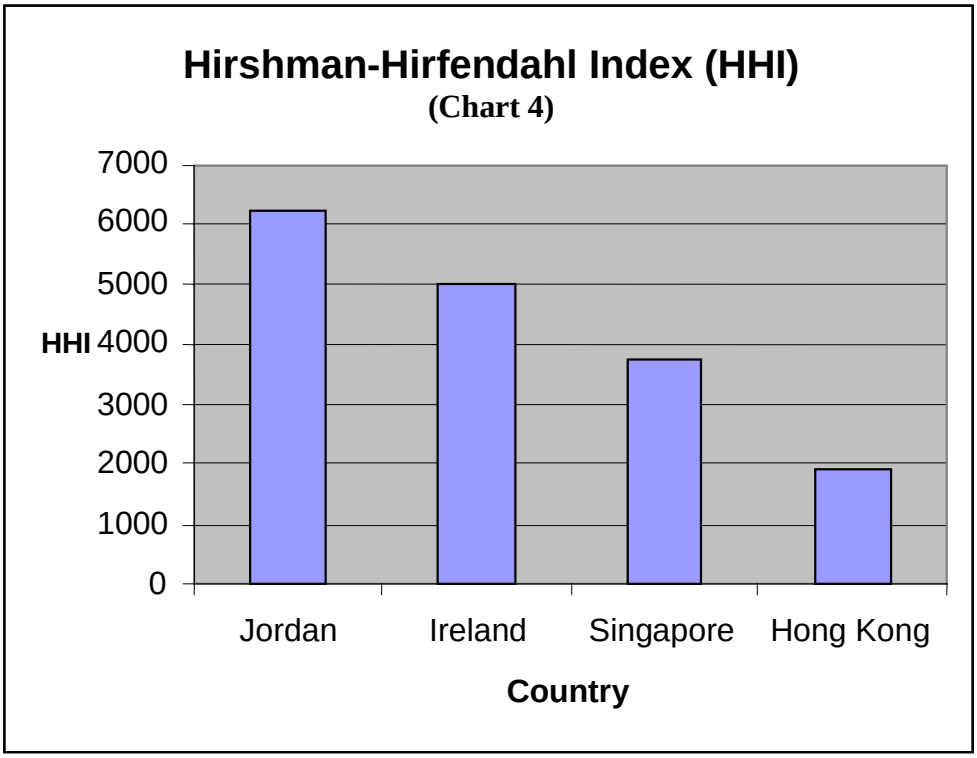
Some of the difference in the total numbers probably lies in definitions of 'active' subscribers. However, the total usage differences between Jordan and Lebanon are unlikely to be fully accounted for by any definitional issues. It needs to be noted that while some dismiss Lebanon as a suitable basis for comparison to Jordan due to the supposed lack of landline network infrastructure, statistics indicate that Lebanon actually has a higher landline penetration rate of 19.5 percent compared to 12.7 percent for Jordan.

The penetration rate for mobile communications has increased steadily in Jordan with the existing duopoly. Some analysts indicate that this increase in the rate of mobile penetration provides evidence that Jordan has a healthy competitive market. However, there are several examples of markets that have a monopoly service provider achieving high penetration rate growth. This report emphasizes that penetration rates are only one indicator to be considered in determining the competitiveness of the marketplace. Upon the review of the pricing for mobile services, usage of the networks, and market concentration, this report does not support other analysts' findings that the growth in the penetration rate for mobile services in Jordan is attributed to a healthy competitive market.

It is useful to use the HHI to consider the degree or intensity of competition in the market in order to examine the functioning of the market that lies underneath these statistical differentials.

The Jordanian mobile market is characterized by a high level of concentration that indicates a low level of actual competition. Fastlink's market share was 84 percent in 2000 a few months after the introduction of competition by MobileCom but has declined to only 75 percent by mid-2003. Significantly, this market share has been essentially constant for the last 9 months. This contrasts with market share – and concentration – in Ireland, where at the end of the third year of a duopoly, the market share of the dominant operator, eircell, was below 60 percent.

Using the HHI, the current index for Jordan is quite high at 6250. In Ireland at the end of three years of duopoly (comparable to that in Jordan today) the HHI was 5200 and has continued to decline to below 5000. Of the countries that Professor Jaoud identifies as leaders in use of mobile services, the current HHI for Singapore is 3764 and for Hong Kong the index is 1936.




## V. Introduction of an Additional Mobile Operator

As noted earlier, there has been significant growth in the Jordanian mobile penetration rate in recent years, although there are indications that high usage prices are holding down subscriber usage of mobile services – a key determinant of consumer welfare.

Both MobileCom and Fastlink offer monthly plans that are comparable to prices in competitive markets but the metered or usage prices for Jordanian mobile subscribers are high in comparison to other markets. Use of such a two-part tariff is quite common in mobile markets around the world. It is widely recognized that the price of network access, which permits incoming calls, has different behavioral implications from the metered or usage price, which affects the demand for call origination.

Additionally, Jordan's current termination charges, particularly for mobile-to-fixed and mobile-to-mobile, support the view that there are price floors for mobile-to-mobile as well as fixed-to-mobile competition

This lack of strong competition has become obvious in the last nine months as mobile market shares have stabilized, an occurrence that generally has not been seen in developed and competitive markets. In 2000, shortly after the introduction of competition, Fastlink's market share was 84 percent. Beginning in the last quarter of 2002 and continuing to the present, Fastlink's market share has remained at 75 percent.

Accordingly the concentration in the market is not decreasing with time under the present duopoly.

The result is that concentration in the Jordanian market remains quite high and reflects 'monopolistic competition' or 'price leadership'. The current HHI for Jordan is 6250. In Ireland at the same point in the progress of liberalization – 3 years after the introduction of competition – the HHI was 5200. As a difference of 100 points in the HHI indicates a measurable and statistically significant difference in market power, the Jordanian market remains highly concentrated and shows no indication of reducing this concentration.

This market share stagnation is co-incident with the substantial widening of Fastlink's on-net/off-net pricing differential. In February of 2003, MobileCom brought to the TRC's attention that Fastlink's recent tariff changes had created substantial differences between prices for on-net and off-net service to the extent that off-net prices were over 350 percent greater than the on-net prices. This pricing technique, in conjunction with the high mobile-to-mobile termination charges, has essentially frozen MobileCom's growth in number of subscribers by influencing the selection of a network operator by new customers – a variant of Metcalf's Law. This pricing scheme along with the very high fixed-to-mobile termination charges is likely contributing to Jordan Telecom's 7 percent revenue reduction in 2002 for its fixed line business. The very high fixed-to-mobile termination charge creates a bias for subscribers when selecting a service provider. With the large number of subscribers on the Fastlink network, and the high cost for a Jordan Telecom subscriber to call a Fastlink subscriber, there is a high likelihood that Jordan Telecom's subscriber level has been diminished by the structure of the termination charges.

MobileCom's response has been to introduce its own on-net pricing scheme. However, both companies are utilizing pricing tools to influence subscriber choice but not engaging in head-to-head competition that would lower usage prices and thus affect subscriber usage of the networks. In less concentrated markets, operators tend to compete for subscribers using price for both network access and usage, which benefits consumers in both dimensions. However, profit-maximizing behavior in concentrated markets tends to generate competition for subscribers but with maintenance of high prices and profit margins. The impact of Fastlink's pricing scheme – given the impact on MobileCom – would be highly detrimental to a new entrant and would be seen as such when bids for an additional license were being considered by potential entrants.

Ireland: A Case Study

Ireland – identified by Professor Jaoud as a 'leader,' serves as a useful benchmark for Jordan beyond telecommunications. Recognizing many demographic and geographic similarities, the Jordanian government has recently met with a number of Irish government information technology (IT) and tourist promotion agencies to draw on their experience.

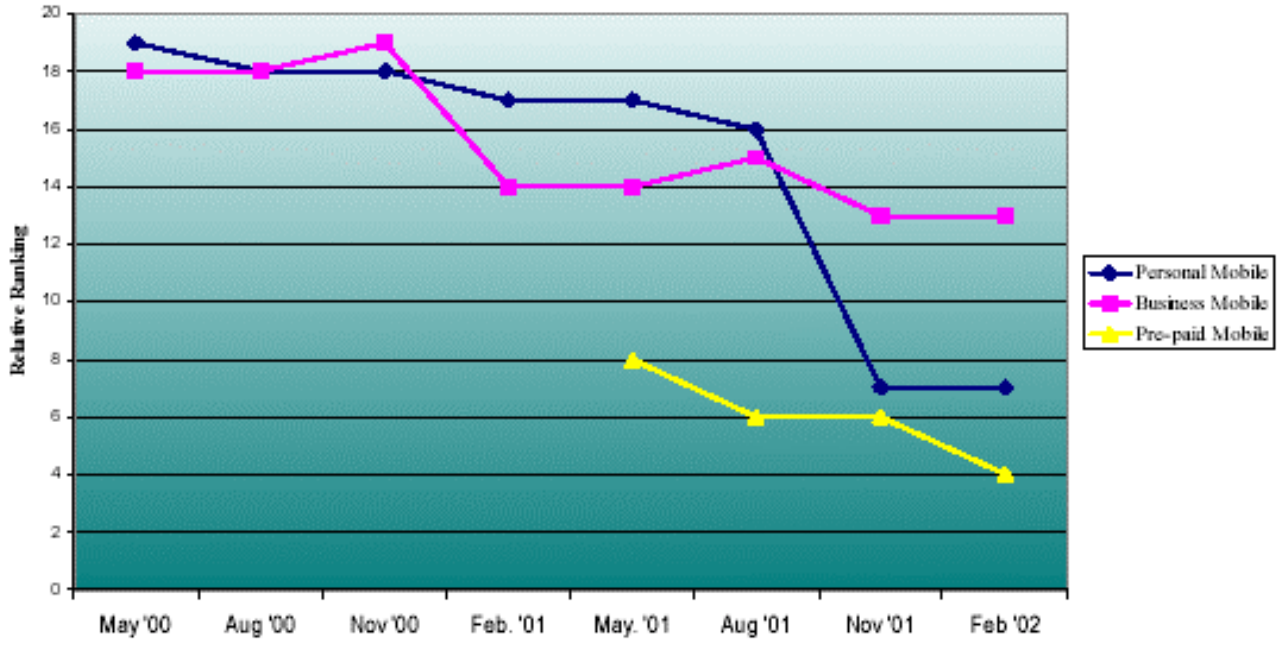
Ireland has a population of 3.5 million (as compared to Jordan's 5 million) and has, like Jordan, some 40 percent of its population in the capital with the rest of the population dispersed in a few cities and sparsely populated areas. As in Jordan, telecommunications is seen as essential infrastructure to promote economic development. In fact, Ireland accelerated its commitment to liberalization to the European Union in the late 1990's as a means of responding to the requirements of the Information Technology (IT) industry. The effort was highly successful with numerous IT firms locating in Ireland so that by 2000 – by value – Ireland was the leading exporter of software in the world.

Ireland, however, has a highly competitive telecommunications market – both for landline and mobile services. The Irish regulator licensed a third carrier that began operating in 2001 when the penetration rate was 67 percent. Even with this high penetration rate, prices for personal mobile services dropped from among the highest in Europe to among the lowest during 2001. The third carrier – Meteor – had all of the network build-out requirements previously imposed on the incumbents but was able to utilize limited number portability.[1]

The impact of the third carrier in Ireland was immediate. During Meteor's first year of operation, prices for personal mobile telecommunications services – Meteor's initial market focus – dropped substantially. Using an index of Ireland's placement among all European Union countries, the Irish Commission for Communications Regulation (CCR) developed Chart 5 below that documents the dramatic change – concentrated in the market in which Meteor concentrated.

[1] The seven digit number behind the three digit carrier-identifying code is dedicated to a single customer, regardless of which carrier is used. The other carriers must sterilize that number when activated by a competitor so that the customer can 'port' it by changing only the initial three digit code.

**Ireland's Relative Position for Various Mobile Baskets**
**May 2000-February 2002**
**(Chart 5)**

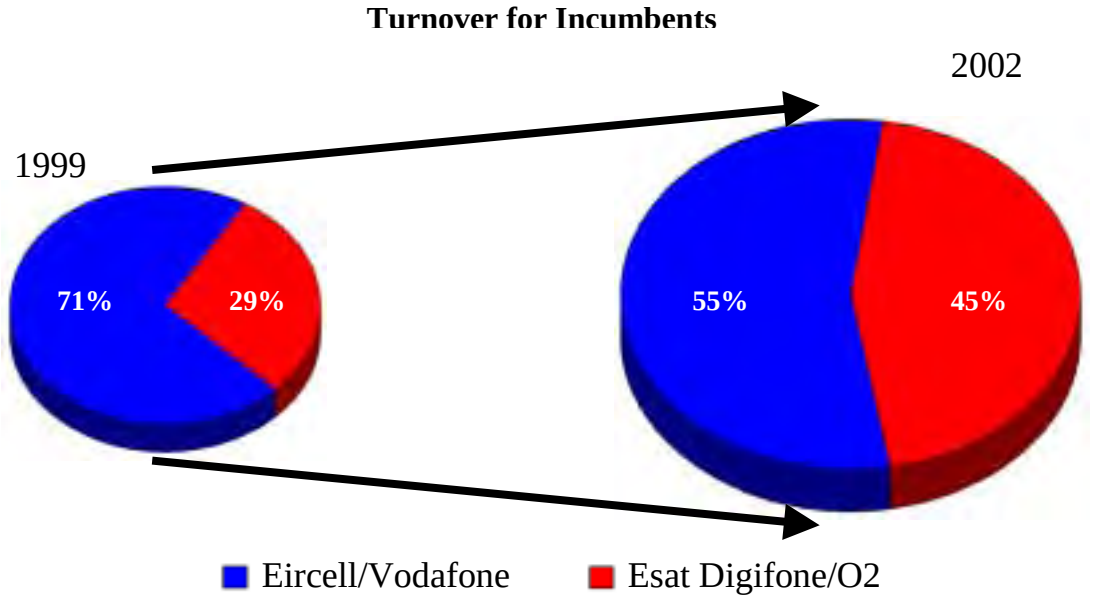



Source: Office of the Director of Telecommunications Regulation, "The Irish Communications Market Quarterly Review," March 2002.

Significantly, even with these price reductions, the market continued to expand to the extent that the revenues of the incumbents continued to grow even as their market shares changed. As the penetration rate was very high prior to the initiation of service by Meteor, and has not increased much since that date, this overall growth of revenue is consistent with the economic studies that have found that the price elasticity of demand for mobile service is greater than one. Lower prices can generate higher overall industry revenues and, depending upon market share, incumbents may also experience higher revenues.

Chart 6 demonstrates the growth of incumbent revenues after the introduction of Meteor in 2001 and the substantial price reductions indicated in the previous 'relative standing' chart.

**Revenues of Incumbent Operators Before and After the Introduction of a Third Operator (Chart 6)**



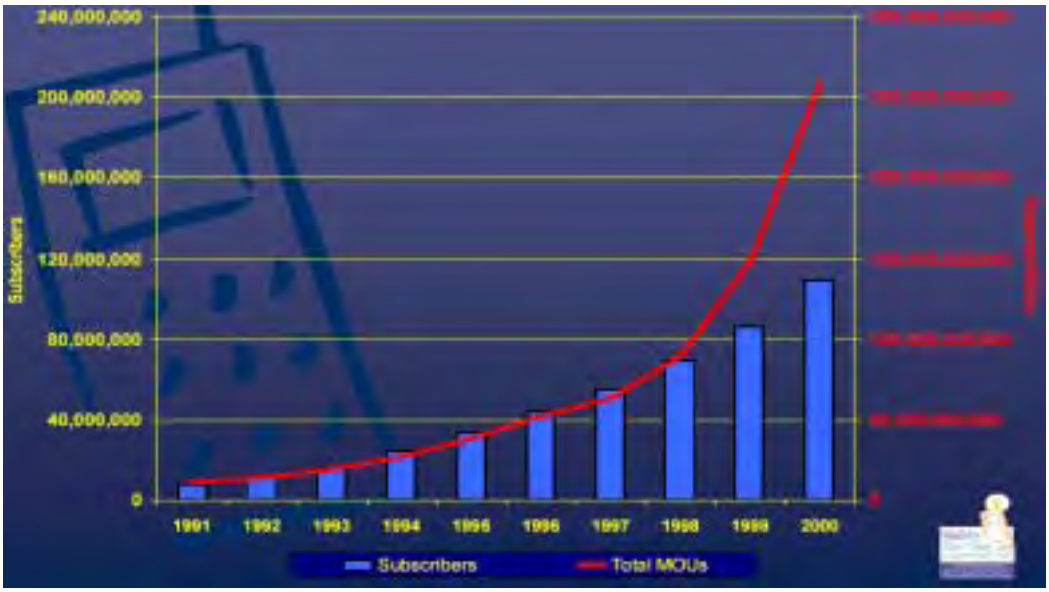

Source: Doherty, John, Commission for Communications Regulation, "Regulating Mobile – Some of the issues," May 19, 2003.

Related Developments

*United States*

Data from the United States also provides an important insight on the impact of new carriers in the market. In 1998/99 the FCC licensed additional carriers that substantially increased the degree of market competition. The resulting price competition brought about a dramatic change in the U.S. mobile telecommunications market. Up to that period, the number of minutes purchased by consumers grew roughly in line with the penetration on the market so that the average subscriber use was roughly constant. With the licensing of additional carriers, however, and the enhanced competition and lower prices that resulted, average subscriber usage began to increase and has continually surpassed the overall growth in the number of subscribers. Chart 7 shows a dramatic increase in minutes of use (MOU) in 1998 when the FCC licensed additional carriers.

**US Wireless Usage**
**Licensing of additional mobile carriers in 1998/99 resulted in increased usage per subscriber (Chart 7)**




Source: Roche, Robert, Cellular Telecommunications and Internet Association, "Measuring Wireless Today," Feb. 2002.

*Bahrain*

In the region, Bahrain licensed a second mobile carrier in April 2003, which will become operational by the end of 2003. Like Ireland, the penetration rate in Bahrain is high, standing at 56 percent. To support the development of competition, the Government of Bahrain has charged a relatively low license fee of US $265,000 and is requiring a revenue share of only 1 percent of gross revenues. Further, the entrant - MTC Vodafone Bahrain (MTC) - has a three-year rollout requirement to cover 95 percent of the population, a relaxed schedule given the small geographic size of Bahrain. To assist the initial service offering of MTC, Batelco (the existing fixed and mobile operator) must provide roaming for one year and, for the first time in the region, Batelco must 'unbundle' its ducts and fiber infrastructure for MTC. Lastly, MTC was also granted the right to construct its own international gateway.

Benefits of Additional Competition

As can be seen from the above data results and market analyses, additional competition in mobile services should result in three principal changes that will improve consumer welfare:

1. prices to subscribers per minute of usage should fall,
2. the average subscriber usage of the mobile networks should rise, and
3. the mobile penetration rate should increase.

Additionally, there are indications that a new entrant can succeed as there is continued strong growth in the Jordanian mobile market. From the first quarter of 2001 to the first quarter of 2002, over 428,000 mobile subscribers were added. For 2002 to 2003, the comparable number was 290,000. As MobileCom's current subscriber base is approximately 300,000, this type of growth seems sufficient to support another operator, especially when the market stimulation of stronger competition is taken into account. In fact, the Ministry study of the mobile market explicitly recognizes this point. The study concludes that in addition to normal market growth, a third operator – by increasing competition – will add 5 percent to the penetration rate by 2005. This represents some 200,000 subscribers.[2]

## VI. Regulatory Considerations

The above analysis indicates that the current mobile market in Jordan is not as competitive as it might be and is more concentrated than would be expected at this point in the liberalization process. Prices are high by regional and world standards and this is constraint on demand, which results in low average subscriber usage and reduces overall use of telecommunications services in Jordan.

A few regulatory factors have also affected the competitiveness of the mobile services market in Jordan. For example, the combination of the interconnection regime and on-net pricing by Fastlink along with the lack of mobile number portability has positioned Fastlink to influence the development of competition in the mobile market as well as between landline and mobile.

Under the current numbering allocation scheme, the subscriber does not control the customer identifier and is precluded from partial number portability. Introducing full number portability is a complex issue with significant implementation requirements. Even so, several regulators consider full mobile number portability a complement that enhances competition among network operators and can lower market concentration to some extent. However, it is not a substitute for strong network-based competition among operators.

Accordingly, there would be significant value to consumers when the TRC further opens the market. Additional licensing should lower prices and increase usage for existing mobile customers as well as raise the mobile penetration rate.

The next section of this report indicates the major regulatory factors that the TRC should address to ensure that any additional licensing of mobile operators is successful in increasing the degree of competition.

[2] Ministry of Information and Communications; Jordan Wireless Sector, Market Liberalization Final Report, p.19.

Success Factors for a New Entrant

Success factors for a new entrant can be broken down into necessary, sufficient and enhancing categories to indicate priority for successful entry. Necessary conditions are critical to address prior to introducing competition. Sufficient conditions are important for growth of a new entrant. Enhancing elements can improve overall conditions in the market.

1. Necessary conditions: *prerequisites for competition generally*

    a) cost-based interconnection rates
    b) prohibition of below-cost pricing of on-net service

    These two issues are currently before the TRC, one of which has been raised in a complaint by MobileCom.

    The TRC is working with an international consulting firm to address the interconnection regime and is expected to develop a means of establishing LRAIC-based prices (long run average incremental cost), for both mobile-to-mobile and fixed-to-mobile termination. Both of these termination rates must be cost-based to permit the development of enhanced competition.

    The peak termination rate for Jordan Telecom to Fastlink has recently been changed as of July 1, 2003 from 120 fils/minute and 75 fils/minute off-peak to 70 fils/minute for both peak and off-peak usage. The termination rate for Jordan Telecom to MobileCom remains unchanged at 70 fils/minute at all times. Mobile-to-mobile rates are 70 fils/minute at all times.

    These rates, and the associated retail pricing, seem to be effectively holding back the development of competition by creating a bias in the decisions of both mobile and fixed line consumers – with regard to the selection of a service provider. For example, low Fastlink prices for on-net calls and the large subscriber base work to its advantage because new subscribers are lured to Fastlink service rather than MobileCom. In addition, fixed line consumers do not want to pay the high termination charges to mobile numbers so consumers will most often become Fastlink customers and take advantage of the large on-net subscriber base. Therefore, market distortions are apparent as MobileCom has experienced no net growth in its customer base during the six months of 2003, while Fastlink has grown and Jordan Telecommunications has experienced a decline of 7 percent in its fixed line revenue in 2002.

    Once termination rates are cost-based, the TRC must prevent below-termination rate pricing by the dominant mobile operator, as this is a strong disincentive for any additional entry.

Resolution of these issues is essential to provide the regulatory certainty necessary for potential entrants to be comfortable about submitting a bid for the new license.

As these matters are being addressed by other project and reports, this analysis will not focus on them.

2. Sufficient conditions: *required for the development of a new competitor*

a) national roaming

So that a new entrant can fully compete when it initiates service, it must be able to provide national coverage. This can only be accomplished by imposing a national roaming requirement on the incumbents. The availability of such a service, however, should not be structured in a manner that would slow the network build-out of an entrant so there should be a 'sunset' provision that is tied to the timing of the roll-out requirements contained in the license of the new entrant.

Additionally, an entrant should not be entitled to earn a profit on resold facilities, so some cost basis such as Efficient Component Pricing (often approximated by 'retail minus avoidable cost') should be used during the obligation period. This would, again, provide an incentive for an entrant to build a network, as profit would only be earned on its own facilities.

Next Step:

- Initiate a proceeding on roaming to allow national coverage for new entrants through adoption of roaming requirements.

b) shared backhaul facilities

Related to national roaming, it would be useful for the new entrant if incumbents were required to share backhaul facilities, if requested by the entrant, prior to the 'sunset' date for fixed line competition. This issue, however, involves consideration of the current JT leased line monopoly.

Next Step:

- Conduct a legal analysis to determine the possibility of introducing shared back haul facilities for mobile providers.

c) fees/revenue share

To make the mobile market more competitive, the TRC should also examine the current revenue share levels, especially in light of the 'special' 4 percent tax recently introduced. Assuming an elastic demand function for mobile service, the price reduction that will be generated by additional competition should actually

result in higher industry revenues so that a lower revenue sharing arrangement can maintain government revenues while simultaneously supporting industry development and indirect government revenues.

Next Step:

- Study current revenue sharing scheme and determine the impact of reduction of revenue sharing with introduction of third mobile operator.

d) full mobile number portability

The TRC should review its mobile numbering plan with an objective of maximizing consumer choice as soon as possible. Any plan that facilitates network identification eases the ability of the dominant operator to devise on-net plans that serve as a barrier to entry for other operators and hinder the development of competition. The TRC should conduct a cost-benefit analysis of introducing full mobile number portability, as has been done elsewhere and will be introduced in Ireland this month (July 2003) and in the United States later this year.

The lack of number portability and other issues such as on-net pricing limit customer choice and result in insignificant changes in market share. This situation has created a segmentation of the cellular market where customers almost act as "captured" customers of a particular network with limited calling occurring between mobile networks (e.g., mobile-to-mobile interconnection accounted for only 8 percent of overall interconnect minutes).

Next Steps:

- Undertake a study on number portability for Jordan.
- Consider having the TRC announce an inquiry on this subject in 2004.

e) spectrum

Sufficient spectrum should be assigned to the new entrant so that complete substitution of customers among operators is possible. The TRC currently has 30 MHz of 1800 MHz spectrum availably for a new entrant – as well as 10 MHz of 'expansion' spectrum available at 900 MHz – which should be sufficient to fully support the needs of the industry.

Next Steps:

- Develop a band plan to provide the new entrant with unoccupied spectrum.
- Consider offering several spectrum options from which the new entrant will be able to select.

- Address any relocation matters, including costs, immediately.
- Identify spectrum that can be used by incumbents to address additional spectrum needs of existing operators.

3. Enhancing elements: *to improve overall conditions in the market*

a) resale class license

The TRC should introduce a class-license regime for airtime resellers and add a resale requirement to all mobile licenses. Resellers can arbitrage non-cost-based price differences in network operator tariffs and provide some additional options, particularly in regional or niche markets such as affinity programs.

Next Step:

- Study the viability of introducing a resale market in Jordan.

b) technological neutrality.

The TRC should review its current licensing regime that incorporates specific technology. One of the immediate issues is the restriction in the GSM licenses from providing a 'push-to-talk' (PTT) functionality and the restriction in the trunking radio license from providing 'cellular' service. Technology currently exists that combines these functionalities in a single handset and traditional cellular carriers around the globe are introducing the PTT feature. Furthermore, PTT roaming across large geographic areas is under development.

A licensing regime that maintains specific technology requirements will be increasingly at odds with market developments and technological advancements, which will harm consumers and will be viewed negatively by potential entrants.

The TRC should also eliminate any specific technology standard such as radio air interfaces (e.g. GSM, CDMA etc.) in its mobile licensing framework and let the market dictate which technology operators choose to deploy or migrate to in the future.

Next Steps:

- Introduce technology neutrality in new mobile license.
- Revise existing licenses to permit more flexibility to operators.

c) examination of Mobile Virtual Network Operator (MVNO) licensing and network access

MVNOs are a recent development and, to date, have only been introduced in: the United Kingdom, Australia, Hong Kong, Sweden and the United States. The

TRC should consider conducting a consultation on licensing MNVOs. An examination of global developments of the role that MVNOs play in the market – and the financial impact on network operators – should be undertaken prior to any such consultation.

Next Step:

- Study the need and viability of creating a framework to permit MVNOs in the Jordanian market.

## VII. Conclusion

The current Jordanian mobile market is not sufficiently competitive to generate the best outcome in terms of price and service development. The addition of another network operator – supported by airtime resellers – will result in lower prices and, importantly, increase the usage of mobile services throughout the economy. In doing so, the Jordanian economy will obtain further benefit from telecommunications infrastructure. Greater competition will encourage technological and service innovation and should provide an impetus to the introduction of data services to a far greater extent than currently exists.

Enhanced competition will also result in raising the mobile penetration rate so that 'late adopters' will find the service attractive and affordable. Entry, however, after three years of duopoly, will require some level of regulatory accommodation so that enhanced competition can develop as quickly as possible on a nation-wide basis.

Beyond the 'sufficient' conditions noted above, the regulatory regime needs to relax the existing specific technology licensing restrictions so that operators can utilize whatever features are consistent with their business plan. The technological blurring of the lines between mobile and trunking services should be eliminated so as to foster, rather than inhibit, technological change and advancements.

Increasing the degree of competitiveness in the market will serve the interests of all Jordanian users of telecommunications services and the economy as a whole.