

The Waterbed Effect Explained in Relation to Roaming

An Economics Perspective

Dubai, 18th January 2009

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Disclaimer

“The views expressed in this presentation are the views of the author and do not necessarily reflect those of Batelco. “

Overview

- Introduction
- What is the Waterbed Effect?
- The Waterbed Effect and Roaming
- Current Regulatory Roaming Initiatives in the Middle East
- Is the Waterbed Effect Good or Bad?
- Conclusion

Introduction

- Roaming Regulation was initially a European Debate
- Spill over into the Arab world:
 - AREGNET was keen to introduce EU-style Regulation
 - EU Regulation in all likelihood has had an impact on Arab Operators
- Keywords
 - Price Caps
 - Transparency via SMS
 - Price Index
 - Profitability
 - Waterbed Effect
 - Customer Welfare etc.....
- This talk is concerned with the Waterbed Effect, its theoretical foundation, significance for operators and consumers and its applicability to Roaming

What is the Waterbed Effect?

Definition

- The effect whereby **“regulation of one of the prices of a multiproduct firm causes one or more of its other unregulated prices to change as a result of the firm’s profit-maximizing behavior”** (Copenhagen Economics)
- the magnitude of the change depends on a number of factors such as intensity of competition, market dynamics, market position, elasticities of demand etc...
 - Imagine you plunge into a pool (or you sit in the middle of a waterbed) – the water level simply rises at the edges
 - Pressing down prices in one part of a firm’s operations causes another set of prices to rise
 - The term “waterbed” was first “coined” by the UK Competition Commission’s late chairman Prof. Paul Geroski in relation to interconnection charges in 1997



What is the Waterbed Effect?

Theoretical Foundation

- Roots found in MTR Regulation:
 - The theoretical literature has demonstrated that unless termination rates are regulated, mobile operators (independently of the intensity of competition) will unilaterally set excessively high termination rates (Armstrong 2005 – in 2008 Armstrong and Wright find in a further study that the rationale for regulation of MTRs is reduced)
- This generates a competitive bottleneck and gives justification for regulation to impose a cap on MTRs with the aim to improve customer welfare
- The Waterbed Effect says that a reduction in the level of MTRs may increase the level of retail prices to mobile subscribers; regulation would thence have a negative impact on customer welfare
- There has been a hot debate about the waterbed effect and its existence; magnitude; significance; and implication for regulatory intervention:
 - NZ Commerce Commission in 2005; OFCOM 2006/2007 both accepting the existence but not assigning much significance; the EU Commission in its recent MTR Impact Assessment

What is the Waterbed Effect? Theoretical Foundation

- No systematic evidence until Genakos & Valetti;
- Mobile subscription prices decrease steadily over time, despite regulation of MTRs
 - But: industry has become more competitive, with additional entry, tougher competition as a countervailing force
 - Observation that MTRs in France have been cut steadily over the years, but prices to medium user customers have remained more or less constant
- Genakos & Valetti examined the impact of FTM regulation on prices and profit margins on a newly constructed dataset of mobile operators across more than 20 countries during the last decade
 - They find that although regulation reduced MTRs by about 10%, this also led to a 10% increase in mobile outgoing prices on average
 - They also found that the waterbed effect is not full, given that accounting measures of profits are positively correlated and therefore mobile firms suffer from cuts in MTRs
- Both competition and market saturation, and most importantly their interaction affect the overall impact of the waterbed effect on prices:
 - The waterbed effect is stronger the more intense competition is in markets with high levels of market penetration and high MTRs

What is the Waterbed Effect?

Theoretical Foundation and Mechanics

- The most debated question is whether termination revenues generated by excessively high termination charges translate straight into operators' profits or are passed on to consumers through lower retail prices
- Termination revenues are at least partly competed away on the retail market due to more aggressive pricing, because:
 - Fixed revenue per subscriber reduces the net fixed cost of servicing a customer
 - In response subscription prices are lowered
- Increase in termination rates and revenues results in:
 - lower acquisition costs
 - intensified competition for subscribers
 - lower net subscription prices and enhanced participation
 - Overall, profits are shared between the firm and their customers
- The significance of the waterbed effect depends on (among other things) the degree of competition that prevails, i.e. strong/perfect and imperfect competition (monopoly)..., and the shapes of the demand and cost functions

What is the Waterbed Effect? Implications

- Mobile telephony is a typical 2-sided market
 - subscriptions and outgoing services are closely interlinked
 - regulatory analysis must take these linkages into account
- Welfare analysis of MTR regulation cannot ignore the presence of the waterbed effect
 - MTR should only be at cost when demand for mobile subscriptions is very inelastic
 - If market not saturated and still growing, great care needs to be taken when setting the optimal MTR
- Serious implications for Roaming (see later slides)



What is the Waterbed Effect?

Empirical Relevance

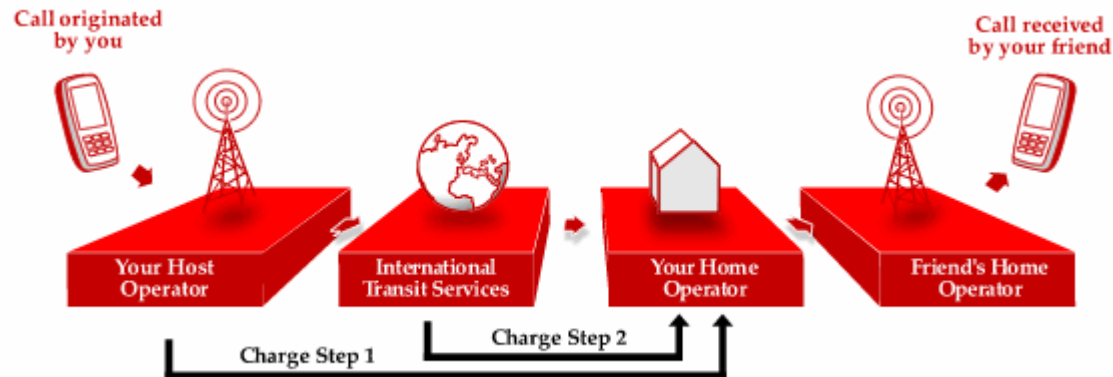
- Individual price setting on interdependent products seems to play a major role in many industries such as banking, supermarkets, restaurants etc...
- Observed “waterbed effect” in other industries, e.g. banking
- First systematic evidence in relation to MTRs (FTM): Genakos and Valletti (2007) found that the introduction of regulation resulted in a ten percent waterbed effect on average under general conditions of competition
- Lab experiment on international roaming price regulation by Copenhagen Economics
- Incidental evidence

The Waterbed Effect and Roaming

- The EU capped roaming charges for making and receiving phone calls within the EU with the aim to lower the costs of making a call when abroad
- Is the waterbed effect also applicable to Roaming?
- Valetti's & Genakos believe so and their 2007 Waterbed Effect study implies that a reduction in Roaming charges:
 - may cause prices of domestic calls to increase, as operators seek to compensate for their lost revenue elsewhere
 - may cause IOTs of affected operators to increase vis-à-vis non-affected operators (i.e. Europe vs Rest of World)
- Under the first scenario, the mobile subscriber of the affected operator bears the burden of regulation
- Under the second scenario, the mobile subscriber of the non-affected operator bears the burden of the regulation, which is a severe negative externality, given that increased IOT rates will be passed on to customers in their entirety

Roaming Explained (from “GSMW Roaming Website” Presentation)

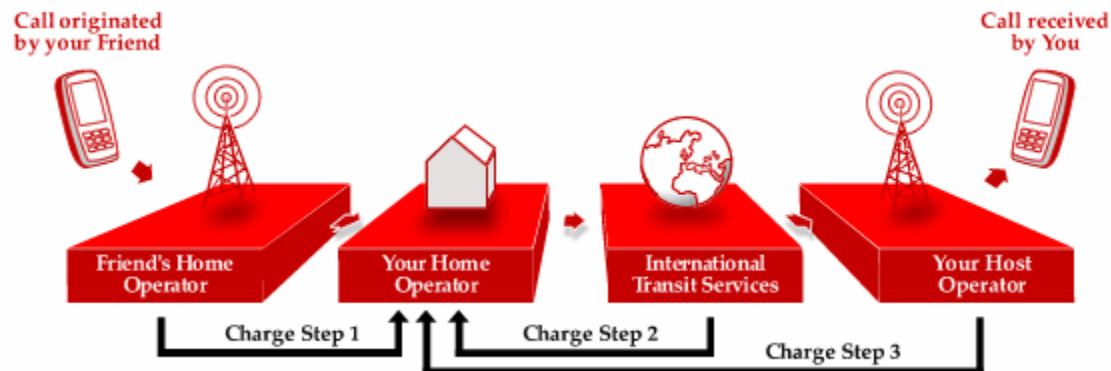
- **How does mobile roaming work?**
- Roaming is technically supported by mobility management, authentication and billing procedures. Establishing roaming between network operators is based on - and the commercial terms are contained in - Roaming Agreements. If the network visited is outside the home country, this is known as International Roaming.
- GSM Roaming, which involves roaming between GSM networks, offers the convenience of a single number, a single bill and a single phone with worldwide access to over 210 countries. The convenience of GSM Roaming has been a key driver behind the global success of the GSM Platform.
- **When abroad and “Calling Home”**
- **What actually happens when you “Call Home”, and what are you paying for?**
- When abroad and “Calling Home” to a friend, your call is managed by the host operator.
- The host operator passes the call via 'international transit' to your home operator.
- Your home operator connects you to your friend’s operator and establishes your call.



- **Who pays for what?**
- **Steps 1 and 2** The host operator charges your home operator a **wholesale rate** which includes the interconnection costs (“International Transit” and costs for terminating the call) and its own network costs..
- **What you pay**
- Your next bill will include the above charges, plus other costs sustained by your operator (i.e. commercial costs, overhead costs, IT costs), plus a “profit margin” applied by your operator

Roaming Explained (from “GSMW Roaming Website” Presentation)

- **When abroad and being called from home**
- **When a friend calls you from your home country, you are charged an international roaming price.**
- A friend calls you on your mobile phone while you're roaming.
- His operator routes the call initially to your home operator (which may or may not be the same).
- Your home operator forwards the call to the host operator you are currently roaming on in the destination country, via 'international transit'.
- The host operator receives the forwarded call, connects you using its network and establishes your friend's originated call.



- Who pays for what?
- Step 1 Your friend will be charged a normal call by his home operator for calling you.
Steps 2 and 3 Your home operator will charge you a tariff which includes inter alia the international transit fees to forward the call to you in the destination country and the cost for terminating the call on the host network.
- **Your friend pays the standard national rate (step 1).**
You as a roamer pay the above charges (steps 2/3), plus other costs (i.e. commercial costs, overhead costs, IT costs), plus any additional charge to provide a reasonable return on investment by your home operator.

The Waterbed Effect and Roaming

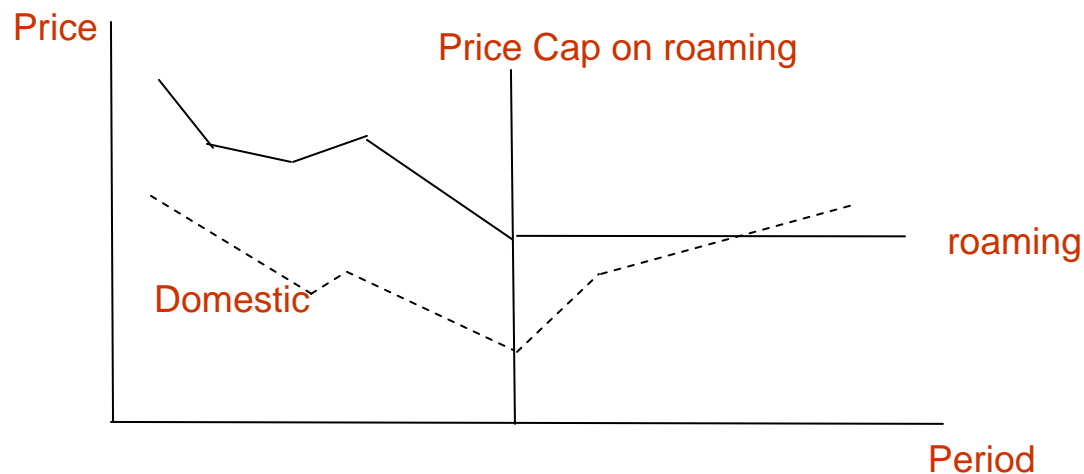
- There has been no empirical study regarding a discernable waterbed effect with regard to Roaming yet
 - It is not clear whether European operators have indeed increased domestic call services; however given the complex structure of tariffs, it is difficult to discern without detailed study;

Also, not all operators will be affected equally by regulation, given that some operators have little roaming revenue, and therefore will not increase prices on domestic services, which would make it harder for other operators to do so

- Copenhagen Economics did a lab experiment in 2008, which modeled the impact of a price cap on roaming
 - Two operators competing through two services (roaming and domestic) over 10 periods, where a roaming price cap is imposed in period 5
 - The experiment shows that domestic prices increase significantly after period 5

The Waterbed Effect and Roaming

- Graph adapted from Copenhagen Economics
- Domestic prices increased substantially after period 5
- Important to look at impact on profits and consumer welfare



The Waterbed Effect and Roaming

- Altex (study for UFC – Que Choisir and BEUC, February 2007) found that:
 - “In relation to the so-called waterbed effect, the reductions announced by the operators on the IOTs have not led to any reduction in the retail prices. Furthermore, the systems to guide traffic to favored visited networks have broadly expanded. However, contrary to the expectations of certain regulators, these solutions have not resulted in a lowering of prices for the final users.”

- There is anecdotal/incidental evidence that European operators have increased their IOTs vis-à-vis non-European operators
 - the effect on customers of non-European network operators however will differ by country, given a number of reasons including different roaming patterns and volumes of roaming traffic as well as preferred network partner agreements etc...

Current Regulatory Initiatives in the Middle East

- In the Middle East Roaming Rates are not yet regulated, although AREGNET was keen to do so in 2007

- There has been a lot of debate in the Middle East regarding Roaming Regulation and it is obvious from a number of industry-led competitive ongoing Roaming initiatives in the Arab Region that operators are reducing retail roaming rates in the absence of regulation:
 - Zain's One Network which is envisaged to cover 17 countries and provides free receipt of calls, local call rates and top-up at local rates while roaming
 - Orange Jordan's 10p/minute offer for receipt of calls in 9 foreign destinations; 10 % discount on all roaming activities
 - Tunisie Telecom: new roaming prices based on zones
 - Batelco's free receipt of calls while roaming in 21 countries and local call rates for making calls while roaming in Jordan
 - Temporary promotions of reduced roaming rates by a number of operators (Algeria has special offers with France and Spain)

- SMS Roaming Transparency Regulation

Is the Waterbed Effect Good or Bad?

- Regulators need to be careful
 - Increasing other prices may be an optimal response in a competitive market with interdependent products
 - Competition vs Monopoly – the more intensive competition, the more incentive for operators to compete for customers in the first place
 - Symmetry vs Asymmetry – regulation must affect all operators equally; if some operators have little roaming revenue, they will not increase prices on domestic services making it harder for other operators to do so
- Focus should be on “interdependency” of products
 - Firms set prices according to consumer preferences
 - Waterbed Effect may be a competitive reaction to regulation
 - It is paramount that the level of competition and consumer welfare based on price and cost of a single product should not be judged



Is the Waterbed Effect Good or Bad?

- An interesting example is Switzerland (Study “International Roaming in Mobile Telecommunications Networks” in 2006 by Copenhagen Economics for the State Secretariat for Economic Affairs in Switzerland)
 - Incentive for EU operators to charge higher prices to non-EU operators
 - No direct waterbed effect assessment but mentions that it should be considered by regulators when deciding whether regulation should be implemented or not
 - What should Switzerland do in response to European Regulation?
 - “EU intervention” (= bilateral agreements – too onerous) vs “laissez-faire” (= new technologies and pan-European groups and alliances emerge as a solution to lower WS and retail prices) vs “national intervention” (= regulate only at the retail level)
- Switzerland decided for “soft regulation” (increasing transparency)
 - Found that retail prices are unlikely to change with falling wholesale rates, as they are not correlated
 - The incentive is weak for mobile operators to reduce international roaming retail prices to attract customers (only partly pass-on lower WS prices to consumers)

Conclusion

- Regulators in the Arab Region should carefully weigh the pros and cons of Roaming Regulation
- The “waterbed effect” may exist and may be significant; it is important to gain distance from solely a cost focus and look instead at interdependency of products and corresponding pricing and competitive market conditions
- Account for the absence of EU-like internal market provisions – the Swiss example and study may provide good insight for the Arab World
- The effect of EU Roaming Regulation has not been entirely studied – more needs to be done in terms of examining operator and customer welfare effects
- It appears that lower wholesale charges will not guarantee a pass-through to customers
- MTR and Roaming Rate Regulation may have important implications for incentives to invest into network coverage (3G) and quality of service

Thank You!



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