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Mobile Termination Rates

A Market Scan within the Context of the Telecommunications Industry in South Africa

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The regulation of mobile termination fees has been the subject of many inquiries and academic studies and continues to receive intense scrutiny from regulators and telecommunications authorities. Our study spans a range of jurisdictions which differ in their geography, economic development and market structure. Lessons learned and insight from these countries are brought to bear in regard to termination fee regulation, specifically in South Africa and other developing nations. There is one prevailing viewpoint that arises when reviewing practices across these jurisdictions: the effects of high termination fees can potentially destabilize competitive markets. Consequently, the need for concentrated, targeted regulatory measures is imperative in developing nations where growth in mobile services continues to outpace growth of other telecommunications services.

The countries considered in this paper include the United States, United Kingdom, Ireland, Germany, France, Australia, Turkey, Mexico, Korea, Japan, Malaysia and Pakistan. Statistics compiled for each country included GDP per Capita (as a measure of consumer purchasing power and general economic well-being), Inflation Rate, Mobile Network Operator (MNO) Revenue per Subscriber, People per Mobile Phone, Teledensity (the number of fixed communications lines per 100 inhabitants), Number of Mobile Operators and market share, by segment and operator.

	GDP / Capita	Teledensity	People / Mobile Phone	Avg. Peak Termination Fee / Minute**	Number of Mobile Operators	Mobile % Total Telecoms Revenues	Market Share of Top 3 Mobile Operators
South Africa	\$13,018	14	1.47	\$0.19	3	66%	55-35-10
Median	\$24,512	104	1.60	\$0.14	7	49%	44-30-17

* 2006 \$U

** 2004-06, \$US

Detailed profiles of each country appear at the end of this article.

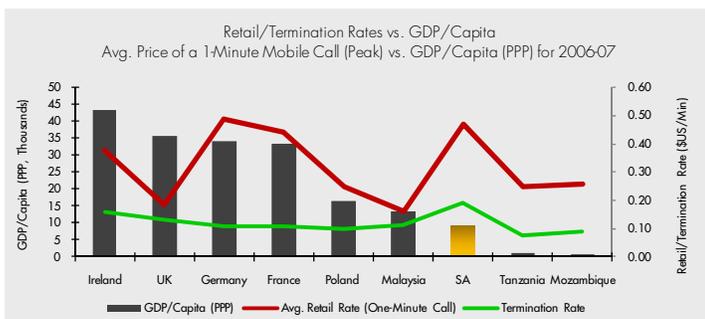


SOUTH AFRICA IS UNIQUE

Both the South African economy and telecommunications sector are unique among the nations included in this study. GDP per capita is considerably below the median, and the telecommunications sector is more reliant on a comparatively uncompetitive mobile telephone market. South African teledensity is low, with only 14 fixed lines per 100 people. Mobile phone ownership is high and almost 70% of the population relies on mobile phones as a primary means of communication. The mobile phone industry is an oligopoly; the two largest operators control over 90% of the total mobile market and account for almost two thirds of total telecommunications revenues in South Africa. Perhaps most striking is the revelation that the average peak termination rate in South Africa is almost 30% higher than the average rate of the international jurisdictions included in this study.

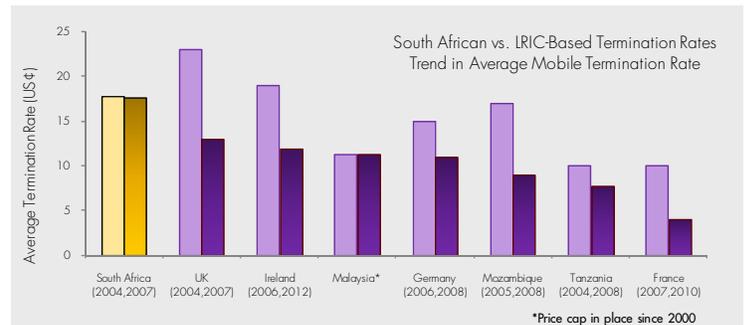
Contrary to expectations, nominal South African termination rates are most similar to those in more countries such as Germany and Ireland. In countries economically comparable to South Africa, like Malaysia and Korea, nominal termination rates are typically much lower, between 20-30% of the South African rate.

Based on the data collected for this study, the effective termination rate in countries that set cost-based termination charges were found to be an average of 33% lower than jurisdictions in which termination rates were unregulated, or regulated using another method (i.e. benchmarking).



The difference between cost-based fees and other pricing methods was most pronounced in developing countries. For instance, South Africa and Malaysia share comparable economic and telecommunications market data, however the cost based termination rates were also price controlled in Malaysia, resulting in rates 300% lower than the peak termination rate in South Africa as of 2008 (approximately \$US 0.04/minute versus \$US

0.177/minute respectively). Alternative regulatory methods, particularly benchmarking, did yield some of the lowest observed termination rates, but there are concerns that benchmarking may not account for differing market conditions in other jurisdictions, resulting in a termination rate that does not reflect the actual cost of termination.



THE NEGATIVE EFFECTS OF HIGH TERMINATION RATES

Many issues associated with high termination fees emphasize the need for their effective regulation in South Africa. High termination fees discourage competition and inhibit entry into the market. Termination fees typically represent one of the most significant costs for small mobile operators – they often tend to be “net payers” with their lower market share; a higher proportion of their traffic represents off-net calls to larger operators. Operators of larger networks would not only enjoy higher revenues but they could potentially be earning “economic profits” – the incremental cost of terminating a call on a large, established network is negligible compared to the cost of outgoing calls.

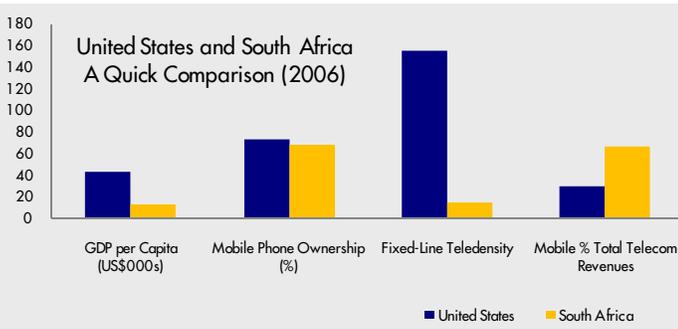
In a “calling party pays” (CPP) interconnection regime, such as South Africa, where operators bill each other, not their customers, for terminating calls, this revenue advantage allows operators with the largest networks to not only offer greater dividends to their shareholders, but also offer more attractive billing rates, greater handsets subsidies, etc. Consumers are, in effect, discouraged from signing with new or small mobile operators. Essentially, the larger operators transfer termination costs to their least portable customers, affording them the opportunity to cross-subsidize more competitive services.

Lastly, high fixed-to-mobile (FtM) termination rates and low fixed-line density discourages the use of fixed-line telephones in favour of mobile phones. This inhibits further entry into the fixed-line market and stunts the growth of fixed-line infrastructure. More importantly, it prevents cost effective and efficient provision of broadband services to consumers.

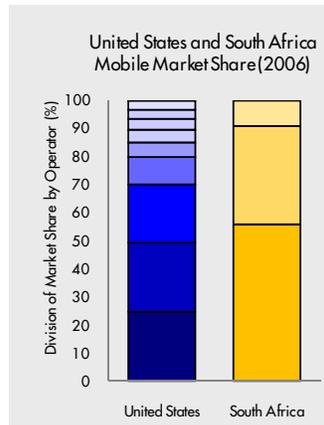


THE AMERICAN CASE

In the United States, termination rates are not set by the regulator, yet they are lower than termination rates in many developed and developing countries. The low, unregulated termination rates found in the United States are due to its particular market conditions and the unique billing method used; 'mobile party pays' or MPP. Under the American MPP system, several concerns associated with termination fees are eliminated. Firstly, concerns regarding FtM termination are eliminated, as FtM termination is non-existent under an MPP system. However, the efficacy of MPP in the United States is mostly derived from the more favourable economic conditions in the United States. Americans enjoy, on average, much higher incomes, fixed-line teledensity and Internet penetration (including VoIP calling) as well as a far more competitive mobile phone market containing over 100 operators.



American consumers are, on average, wealthier, enjoy more substitutes for mobile calls and can afford to be more selective mobile consumers. These conditions place greater pressure on American operators to compete on price by lowering rates where possible.

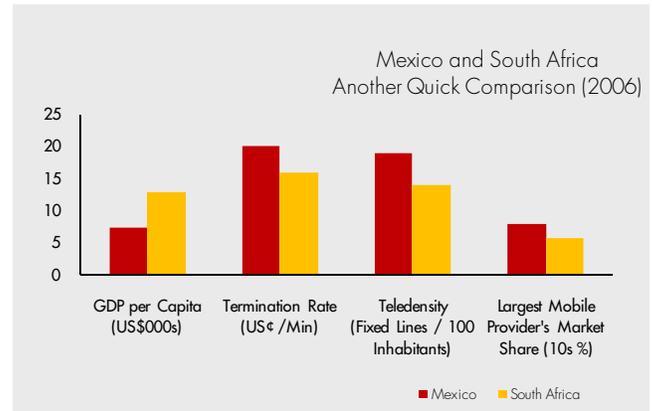


With the vast number of mobile operators, it is likely that most, if not all, American operators are net payers of termination charges and would hence prefer low termination rates and seek to reduce termination costs/raise termination revenue through customer incentives, such as offering unlimited incoming calls or unlimited calling between individuals on the same network, which are commonplace in the United States. These economic and market conditions make unregulated termination rates far more viable in the United States than in South Africa.

THE MEXICAN CASE

Compared to the United States, Mexico provides a contrasting view of unregulated termination rates. In Mexico, GDP per capita and fixed-line teledensity is low, and the mobile phone market is monopolistic, with the single largest carrier controlling almost 80% of the market. In Mexico termination rates are neither regulated nor published and termination fees are among the highest in the world. Relative to GDP, Mexican termination rates were the highest of any country included in this study.

Poor teledensity and the *de-facto* monopoly in the Mexican mobile market have created an environment in which Mexicans have few alternatives to mobile telephony. In the absence of competitive pressure or regulatory constraints, the dominant operator has no incentive to lower termination rates as they provide revenues and help to consolidate its dominant position by raising competitors' costs, while discouraging potential fixed or mobile operators from entering the market. In this regard, the Mexican case suggests that high termination rates, poor fixed-line access and mobile market monopoly are both interrelated and mutually reinforcing.



Economically, Mexico resembles South Africa more closely than many of the countries included in this study, and the monopolistic mobile market, poor fixed-line development and high termination rates in Mexico serve as an illustration of the potential negative effects excessive termination fees could have on the South African telecommunications market.

THE BRITISH CASE

The United Kingdom is economically and technologically advanced, has exceptionally high teledensity and GDP per capita and a highly competitive mobile phone market. However, British

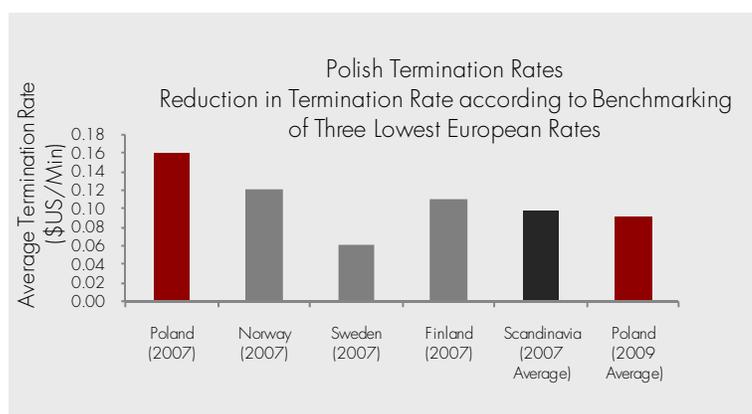


termination fees are the highest of any country in this report in nominal terms, which is only partly attributable to the high price index in the UK.

Although British termination rates are regulated according to long-run incremental cost (LRIC) based pricing, mark-ups for fixed and common costs and a unique allowance for “network externality benefits” (a mark-up to account for the benefits derived from owning a mobile phone) increase the British termination rate beyond cost-basis, perhaps by as much as 30%. This practice has been rejected by academia and national regulators alike because additional mark-ups effectively defeat the purpose of cost-based pricing. Some argue that non-cost-based regulation serves only to increase regulatory costs without effectively constraining termination rates (similar to what economists call a “government failure” or “non-market failure”). Furthermore, network externality mark-ups are difficult to justify in South Africa and other countries where mobile phones are an essential commodity upon which many rely as a primary means of communication.

THE POLISH CASE

In Poland, after an acrimonious regulatory transfer of power, the new national regulatory authority, UKE, adopted an unusual approach to regulating mobile termination rates. Dismissing more conventional cost-oriented regulation, the Polish regulator instead lected to cap the Polish termination rate at a figure determined by benchmarking the three lowest rates in Europe, which, at the time, would have been the Scandinavian countries of Sweden, Norway and Finland. Using this method, the Polish regulator set a glide path that would fix termination rates at approximately nine cents



(US) in 2009 and eight cents per minute by 2010.

The Polish method of benchmarking had the desired effect of reducing termination charges to a level close to the lowest in Europe. However, this method had several shortcomings.

Foremost, operators protested that the benchmarking method did not accurately reflect the circumstances of the Polish mobile telecommunications market. Mobile telecommunications networks in Scandinavia are largely composed of efficient, technologically advanced 3G networks and Scandinavia has among the highest mobile penetration rates in the world. These factors allow Scandinavian mobile networks to operate at lower incremental costs than Polish networks, which are exclusively comprised of less efficient 2G networks, are able. As such, some Polish operators indicated that the termination rate imposed by UKE would force them to operate at a loss with respect to interconnection, and argued instead for the setting of cost-oriented termination rates.

THE FRENCH CASE

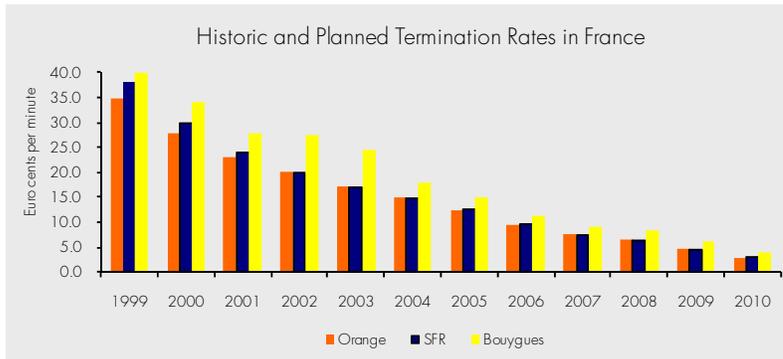
Despite being the second largest economy in the European Union, France’s mobile penetration (83% in 2007) is one of the lowest in the European Union (which had an average penetration of 111% in 2007). This is mainly due to the rather static mobile market consisting of two large (Orange and SFR) and one small operator (Bouygues), with only limited activities of Mobile Virtual Network Operators (“MVNOs”). In 2005, all three mobile operators were fined €534m (US\$630m) by France’s Competition Council for price fixing through sharing commercial information between them, thus distorting competition.

The French regulator (ARCEP) has implemented an aggressive strategy towards lowering mobile termination rates, which by 2010 will be among the lowest in the Europe. Employing a modified version of the LRIC model used in the UK, ARCEP concluded that a reduction in termination rates to a strict cost-orientation was necessary to prevent market distortions and promote competition. Specifically, ARCEP was concerned that excessive termination rates would create an environment in which larger operators (which typically have a positive balance of on-net to off-net calls) would have a significant advantage over operators who do not (smaller or new operators). Such a system causes operators to distort competition by cross-subsidising on-net calls at the expense of off-net calls.

Orange and SFR have shared the same termination rate since 2002. ARCEP allows Bouygues a higher mobile termination rate (€4 cents versus €3 cents in 2010), due to its later market entry and, as consequence, smaller market share. Although Bouygues was in favour of the reduction in termination rates, Orange and SFR objected to several implications of using the LRIC methodology. They argued that the termination rate imposed provided no incentive to provide network coverage to underserved areas and would cause a “waterbed effect” whereby they would be forced to raise the prices of services subsidized by termination, effectively



forcing the poorest and most price-sensitive customers out of the market.



THE GERMAN CASE

In Germany, mobile penetration has risen rapidly and is above the EU average. The main reason for this ongoing dynamic is falling retail prices due to low-cost service providers entering and expanding the market by offering a minimum service, often with particularly low costs for on-net calls. As of 2008, all supermarket chains as well as one national newspaper offered MVNO services.

Up until 2006, the German regulatory authority (BnetZA) used international benchmarking to set mobile termination rates. As of 2007, these rates have been set using LRIC models. This led to an immediate reduction of termination rates by 20% in 2007 and another 10% in 2008 for the two largest operators; the 2008 reduction for the two smaller operators was around 11.5%. BnetZA maintains higher termination rates for the two smaller operators due to a higher cost base caused by later market entry, lower market shares and the use of GSM 900/1800 networks that are less efficient and more costly to operate than the 3G networks employed by the larger operators.

BnetZA acknowledged that, in line with recent EU policy developments, the first two reasons for allowing higher termination rates will become less relevant over time. As an initial step towards harmonizing mobile termination rates, BnetZA reduced the differential between the rates from 13% to 11% effective 2008.

According to a report by the European Commission, not all end-users in Germany have been able to benefit from the lower rates as the incumbent apparently does not pass on the reductions in termination rates to its customers (or passes them on with significant delays).

THE NEED FOR COST REGULATION

One of the main governmental objectives is to create and increase overall welfare in a country. This can usually be achieved by allowing market forces to create such welfare in a competitive environment. Regulation is needed in cases where market failure leads to a sub-optimal level of total welfare or even to a reduction in welfare.

In the case of telecommunications, operators with significant market power ("SMP") in a given market have the power to set prices at will in that market. This, in turn, leads to higher consumer prices, as the SMP operators try to maximize their own profits, which then leads to lower consumption levels, reducing overall consumer welfare. Typically, the increase in producer welfare (of the SMP operators) does not offset the loss of consumer welfare.

WHAT IS THE BEST PRICING REMEDY?

There are several critical issues that arise with regard to competition in telecommunications. Key among these issues is the *denial to interconnect, productive inefficiencies, tacit collusion, excessive pricing* and *price discrimination*. Firstly, an incumbent operator or an operator with significant market power could *deny* any form of interconnection. This forecloses the market for any new entrant, establishing a de facto insurmountable barrier to entry. In reality many incumbent or SMP operators find "creative" ways to delay interconnect or provide insufficient capacity or unacceptable quality of service due to "technical reasons". Alternatively, an SMP operator might often fail to produce efficiently. Given the market leader position, there is little incentive or pressure to increase efficiency rapidly.

If left on their own, operators may agree on reciprocal high termination rates, which in turn will lead to profit maximization for the operators at the expense of their customers. This tacit collusion is very likely to lead to a sub-optimal level of total welfare (i.e. consumer welfare will be reduced more than the producers' welfare will increase). Coupled with tacit collusion is the possibility of excessive pricing on the part of the SMP operators. Without regulatory intervention, operators might set higher fixed-to-mobile than mobile-to-mobile termination rates. This surplus could, for example, be used to subsidize handsets. This may lead to an increase in total welfare, albeit at the expense of fixed operator(s).

Finally, if the largest mobile operator is allowed to set excessive mobile-to-mobile termination rates, this will increase the on-net/off-net differential for the smaller mobile operator and thus leads to a faster growth of the large operator, as the smaller operator typically



will depend on a much larger proportion of off-net calls. The large operator will be able to offer an overall cheaper service given its high proportion of on-net calls.

These issues underline the necessity for regulatory intervention, which falls into two main categories; the imposition of an access obligation to the SMP network (i.e. impose the obligation to interconnect) and price setting for areas where there is a lack of competition. Price setting is able to address several of these key problems. Tacit collusion and excessive pricing may be addressed by setting termination rates at cost level. In addition, productive inefficiencies are addressed assuming a reasonably efficient operator to determine the cost level. Price discrimination may also be addressed by accounting separation into a wholesale and a retail business, performing margin squeeze tests.

THE CASE FOR LRIC

Termination fees that correspond to the Long Run Incremental Costs (LRIC) of providing those services allow operators to recover portions of common costs, such as costs that are common to all network services, (e.g. shared ducts between the access and the core fixed networks), and costs that are common to the whole business, (e.g. corporate functions supporting both the retail and the wholesale (or network) division). If an operator offered interconnection at pure incremental cost, competitors buying from it could potentially undercut it and drive it out of business, or decrease its incentives to invest in infrastructure. Above all, an LRIC-based cost model must be based on a reasonably efficient operator and should offer maximum transparency.

Cost modeling carries with it several implications including, the use of current costs (instead of historic costs), the use of a bottom-up approach (instead of top-down), the use of a “scorched node” approach (instead of “scorched earth”), the use of long-run incremental costs (instead of fully allocated costs), allowing for asymmetric termination rates (if justified).

Cost models can be prepared using either *historic costs* or *current costs*. Historic costs are the value of assets contained within the fixed asset register and represent the actual value that was paid. Current costs are obtained where the assets are re-valued to represent their value at current purchase prices. Adjustments can also be made to the asset base to reflect the cost of a modern equivalent asset where a cheaper, more efficient substitute asset is now available. Historic costs are usually favored for commercial decision-making purposes since they also form the basis for measuring accounting profit. The current cost approach is considered best practice by regulators as it provides a better representation of the true economic cost and hence leads to

economically preferable prices. However, the estimation of current cost values is highly subjective, time consuming and resource intensive.

The primary motivations for why costs have to be current and not historic for regulatory modeling are twofold. Firstly, in an environment of *decreasing asset prices*, termination rates based on higher historic costs would provide the wrong investment incentives as alternative operators would be better off building their own network, thereby replicating the incumbent’s network, leading to an inefficient expense. Secondly, in an environment of *increasing asset prices*, termination rates based on lower historic costs would not allow the incumbent to replace its assets and lead to an obsolete, dysfunctional network.

A *top-down approach* uses accounting data of an operator, and allocates costs to different services on the basis of views as to the relationships between costs and services. Establishing these cost-volume-relationships (CVRs) require assumptions on the scope for efficiency improvements and replacement of historic costs with current values. In addition, this approach requires that existing infrastructure elements and operating resources be replaced by new and optimal types of equipment and operating methods. Top down models are robust and easy to develop, however, they may include inefficiencies in the outputs, they provide little understanding of cost relationships and they are usually rather inflexible.

A *bottom-up* cost analysis should start from what it will cost to produce the interconnection products in question in a network with an ideal configuration which is operated by an ideal company and is based on the newest technological solutions and an optimally structured organization. To a large extent, bottom-up analyses are based on engineering models which determine the ideal network configuration for a given level of demand. Based on these engineering principles, bottom-up models provide a very good understanding of cost-volume relationships and produce optimized results. However, there is a risk of underestimating costs through over-optimization and these models require more resources to build and populate. Bottom-up models are useful for a range of purposes such as calculating economic depreciation, normalizing costs for different technologies and network traffic, and for non-uniform allocation of common costs.¹

¹ Bottom-up models can adopt a “*scorched earth*” assumption, which assumes a “green field” approach, with no limitation on where to place network nodes. There is no requirement to use the SMP operator’s existing node locations when modeling an optimized network. Theoretically, optimizing networks without any constraints in terms of their design, allows eradication of any inefficiencies, which is one of the main goals of LRAIC methodologies. However, scorched earth models are very data intensive and could result in networks that bear little resemblance to existing networks. “*Scorched node*” is the preferred approach to bottom-up models in many



The most common methods of allocating costs are the *fully allocated cost ("FAC")* basis and the *long run incremental cost ("LRIC")* basis. A fully allocated cost model takes all the costs of the business, whether they are directly attributable to a particular service or common, and allocates them to services. A LRIC model considers the incremental costs of providing a particular service by measuring the costs incurred by providing that service. This approach removes any sunk costs (i.e. past costs that cannot be recovered) and hence is economically preferable when making investment and pricing decisions, including the determination of interconnection prices. A mark-up to cover (unallocated) joint costs is usually allowed by regulators but the overall service costs allowed does not usually represent the cost base of the company.

Whereas FAC is modeled as top-down, LRIC may be modeled from a top-down or a bottom up perspective. However, since LRIC adopts an economic approach to costing, there can be a number of key differences between the two approaches. The table below summarizes the main differences based on typical approaches to the two costing methodologies:

Parameter	Fully Allocated Cost ("FAC")	Long Run Incremental Cost ("LRIC")
Value metric	Historic costs	Current costs
Scope	Fully-allocated	Excludes common costs
Perspective	Historic	Forward-looking (excludes irretrievable/sunk costs)
Operational efficiency	Reflects operator's (in)efficiency	Based on (ideal) efficient operator
Cost allocation	May be arbitrary in places	Should be based on cost causation

The methodology recommended by international standardization bodies is LRIC or Long Run Average Incremental Cost ("LRAIC") for setting interconnection prices. LRIC is defined as the marginal costs of adding or removing a certain increment of traffic. LRAIC is broader than LRIC that include all types of costs related to a certain increment such as "all services in the access network" or "all services in the core network". While the majority of African countries have adopted the same termination rate for each of their mobile operators, European Union countries (most of which

countries. This approach requires equipment to be placed at existing locations, but does not constrain the type and configuration of the equipment.

implemented LRIC) have been using (and many still use) *asymmetric rates*, if this can be justified economically.

Essentially, termination rates should be based on the costs of an efficient operator. The cost base of efficient operators can be substantially different for several reasons. First of all, later market entry, due to later license acquisition leads to higher (initial) costs to roll-out and provide a service similar to the established operator, who already acquired large parts of the market. Moreover, the resulting lower market share leads to lower economies of scale, thus increasing the unit production costs of a smaller operator (who still operates efficiently, given his size and market position). Also, the use and/or access to different resources, namely the amount and type of spectrum: a typical example is the limited availability of 900MHz and 1800MHz GSM spectrum: third or fourth operators may only be allocated spectrum in the 1800MHz range, which requires a significantly higher number of base stations to cover the same geographic region compared to using 900MHz spectrum.

If all conditions for all mobile operators are the same or comparable (same date for granting of license, same amount of spectrum, same license fees etc.), then symmetric termination rates are easily justifiable. However, if one or more of these parameters differ significantly operators should be given a different (higher) termination rate to allow them to recover the actual cost of service for an efficient operator based on these parameters.

ALLOWING FOR NETWORK EXTERNALITIES

The United Kingdom is an economically and technologically advanced country, featuring high fixed-line penetration, GDP per capita and a highly competitive mobile phone market. However, nominal British termination fees are among the highest of any country included in this study, which is only partly attributable to the high price index in the UK. Although British termination rates are regulated according to LRIC based pricing, mark-ups for fixed and common costs and a unique allowance for a 'network externality surcharge' (a mark-up to account for the benefits to the market derived from owning a mobile phone) increase the British termination rate beyond cost-basis, currently. The practice of allowing termination rates to include network externality surcharges has been contentious and studied by academics and national regulators alike in recent years.

In their determination, the British regulator stated that the purpose of network externality surcharges ("NES") is to provide an incentive, in the form of a subsidy, to marginal non-subscribers to purchase a mobile phone. It was reasoned that such charges are justified, as they provide a benefit to the current subscribers who bear their cost, as each additional mobile subscriber represents an additional



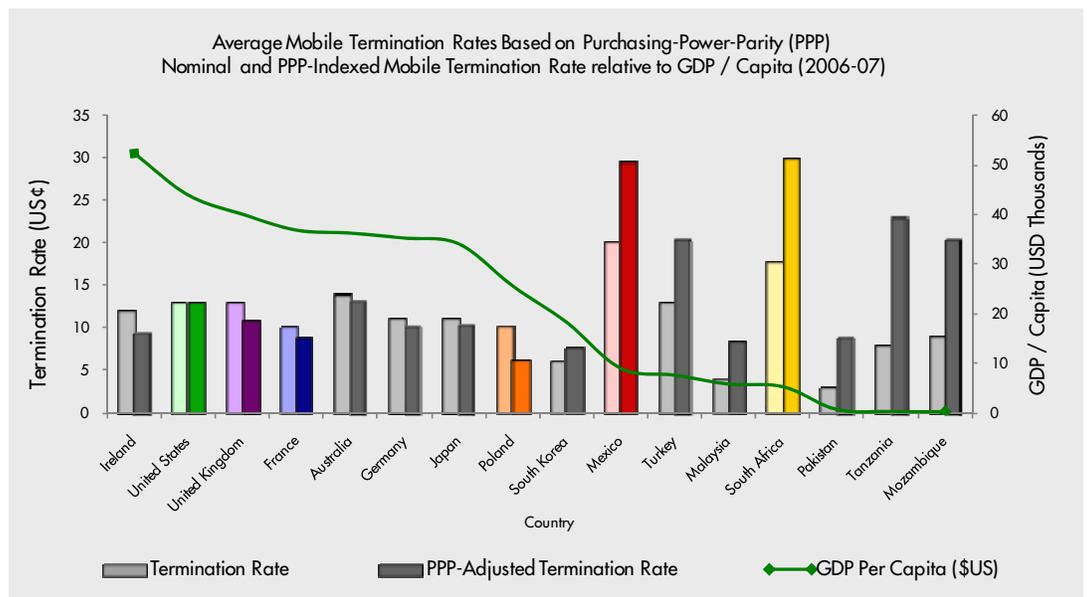
externality benefit to current subscribers by creating an additional person who they may reach by mobile phone.

Similar studies into NES conducted elsewhere reached different conclusions. The Tanzanian regulator (TCRA) concluded that NES ought to be omitted from termination rates (at least pending future establishment of pertinent standards by the ITU or TCRA) on the grounds that the theoretical gains realized by subsidizing marginal customers through externality surcharges do not justify the disadvantages they create in the form of large cross-subsidies and market distortions. Similarly, the Israeli Ministries of Communications and Finance conducted a NES study using the same model applied in the UK. According to this analysis, it was determined that the high mobile penetration rate in Israel (approximately 95%) rendered the marginal benefit of an additional subscriber infinitesimal. Furthermore, census data implied that given the high mobile penetration rate, only those who are very young (or extremely price sensitive) do not already own a mobile phone, hence the number of marginal subscribers attracted by NES would be practically zero. As such, regulators dismissed considerations of a NES from the LRIC-based termination rate set in Israel. Inquiries into the merits of NES reached similar conclusions in Norway, Sweden and Australia, all countries where mobile penetration are near or in excess of 100%.

As such, it can be seen that NES are best suited to jurisdictions with adequate fixed line penetration that wish to promote mobile penetration. Hence, the case for NES in countries like South Africa is as a means to increase mobile network penetration and subsidize new mobile customers, many of whom may be poor and reliant on mobile phones as their primary means of communication. Others argue that NES are difficult to justify where mobile phones are already widely owned and anti-competitive market distortions caused by NES may outweigh the potential benefits.

highest of all those observed in this study. It is worth noting that there are several similarities shared by the three developing countries with the highest termination rates relative to PPP: South Africa, Turkey and Mexico. In all three jurisdictions, termination rates were determined by operators and largely unregulated, fixed-line access is poor (fixed-line penetration is below 25% in each country), no more than three mobile operators are active and the largest mobile operator controls 56% or more of the total market. This trend further suggests that there exists a positive correlation between high termination rates and an uncompetitive mobile telecommunications market, especially in jurisdictions where poor fixed-line access fails to provide a viable substitute for mobile telephony.

When measured relative to GDP per capita (a more objective measure of the true cost of termination fees as it accounts for



national economic conditions and the wealth of the average consumer) South African termination fees are even more excessive, between 150-300% higher than the average in the study. This trend further suggests that there exists a correlation between high termination rates and a poorly developed, stagnant and uncompetitive telecommunications market.

As a result of significant entry barriers to the oligopolistic mobile market and low fixed-line teledensity, South Africans have no alternative to using current mobile providers. Without substitutes to mobile phone use there is no consumer pressure to moderate prices, impeding both competition and the development of fixed-line infrastructure. Effective regulation would benefit South Africans by setting fair prices for call termination, in turn encouraging competition and promoting new entry into the mobile market. In

THE SOUTH AFRICAN IMPERATIVE

The figure following illustrates, when measured relative to purchasing power parity (PPP), (which provides a better representation of the "real" cost of termination fees in each jurisdiction) the termination rate in South Africa was (in 2007) the



In addition, regulated termination rates would create the incentive for dominant telecommunications operators to develop new revenue sources, while providing smaller operators with greater means to compete in the provision of both new and existing services. In addition to providing consumers with newer and better options, the development of new services would likely include the development of infrastructure missing or under-developed in South Africa, like new fixed-line cable networks for high-speed Internet services, a sector that remains largely undeveloped in South Africa.

The challenges facing both the Independent Authority of South Africa and the Department of Communications, while working within the framework of the Electronic Communications Act, are not insurmountable. A firm regulator, supported by an equally steadfast government, is critical now to manage and achieve meaningful reductions in mobile termination rates.

ABOUT THE AUTHORS

Brendan Thompson specializes in business modeling and international telecommunications regulatory policy, having assisted clients in Canada and South Africa. Mr. Thompson has a background in finance, regulatory economic policy and statistical analysis.

Alka Sood is the President of Cogna Management Solutions Inc. With over over twenty years of management consulting and international experience she assist clients around the globe on a wide range of business and regulatory issues.



AUSTRALIA AUSTRALIAN COMPETITION AND CONSUMER COMMISSION RECOMMENDATION (2003-5)

	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 1.15 People/ Mobile 2. GDP/Capita: \$33, 3. Inflation: 2.4% (2005-07 4. MNO Revenue/Subscriber: \$ 5. MNOs: 6. Teledensity: 7. Mobile % Telecom Revenues: 44 8. MNO % Market Share: 45-33-17-5 9. Termination Fee / Minute: 0.14	<ul style="list-style-type: none"> ▪ Consumer ignorance necessitates direct regulation of TF prices. ▪ Despite benchmarking of aggregate wholesale-to-retail rates, TFs had continued to rise ▪ Recommended that MiM TFs should be reduced by almost 50% by Jan. 2007 (from approx. \$0.21/min to \$0.12/min). FiM calls remain fixed at \$0.49/min 	<ul style="list-style-type: none"> ▪ Regulation needed in order to i) promote competition ii) increase connectivity and iii) produce economically efficient investments in technology. ▪ In the absence of regulation, consumer ignorance allows MNOs to raise TF prices to unreasonably high levels without fear of consequence 	<ul style="list-style-type: none"> ▪ Prof. S.C Littlechild of U of Cambridge argues that given competitive nature of the mobile phone industry, emphasis should be placed on promoting entry into the market and not the imposition of price controls. Littlechild suggests that increasing consumer awareness and providing SIM card details of mobile subscribers to all competing MNOs would effectively foster competition and reduce mobile rates 	<ul style="list-style-type: none"> ▪ MNOs MCI and AAPT, who were unsuccessful in entering the MNO market in 2001 requested that TFs be lowered to European levels ▪ Larger, established MNOs argued that MNO industry was already very competitive and that lower TFs would result in higher usage fees for mobile customers



FRANCE AUTORITÉ DE RÉGULATION TÉLÉCOMMUNICATIONS (ART) INQUIRY (2002)

	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 1.31 People/ Mobile 2. GDP/Capita: \$31,825 3. Inflation: 1.6% (2005-07) 4. MNO Revenue/ Subscriber: \$ 5. MNOs: 6. Teledensity: 7. Mobile % Telecom Revenues: 40 8. MNO % Market Share: 47-36- 9. Termination Fee / Minute: 0.14	<ul style="list-style-type: none"> ▪ "Bill-and-Keep" interconnection method was used, therefore no money is exchanged between MNOs. Each MNO bills its own customers for the off-net calls they make. Therefore FiM TFs are primary regulatory concern ▪ MNOs determined to be significant market powers (SMPs), defined by ART as MNOs with >25% market share, subject to graduated 40% reduction in TFs between 2002 and 2004 and introduction of indivisible minute (per second) billing 	<ul style="list-style-type: none"> ▪ ART wished to have more time to consider alternatives to the "Bill-and-Keep" billing method. ▪ Initial 40% reduction (in three stages) negotiated with three major MNOs ▪ Formulating an exit strategy for the "Bill-and-Keep" method would be complicated. ATR decided additional time would have to be devoted to considering how to best extricate the French telecommunications industry from "Bill-and-Keep" method should that course of action be taken 	<ul style="list-style-type: none"> ▪ Patrick DeGraba, former deputy chief economist at the Federal Communications Commission, is perhaps the greatest proponent of the "Central Office Bill-and-Keep" (COBAK) method. DeGraba believes that 1) Preventing a called party's carrier from charging an interconnecting carrier for termination and 2) Making the calling party's network responsible for cost of call termination between the two networks' central offices will eliminate (or at least reduce) the inefficiencies and inequalities of other CPP TF pricing schemes 	<ul style="list-style-type: none"> ▪ MNOs and FNOs largely support the removal of the "Bill-and-Keep" method. MNOs dislike the tax implications that stem from "Bill-and-Keep" revenues, while some FNOs have argued that "Bill-and-Keep" creates market discrimination and may even be fiscally illegal



GERMANY REGULIERUNG ELEKTRIZITÄT GAS TELEKOMMUNIKATION POST (REGTP) DECISION (2002)

	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 1.04 People/ Mobile Phone 2. GDP/Capita: \$31, 3. Inflation: 2.3% (2005-07) 4. MNO Revenue/Subscriber: \$ 5. MNOs: 4 6. Teledensity: 157 7. Mobile % Telecom Revenues: 35% 8. MNO % Market Share: 37-37-13-12 9. Termination Fee / Minute: 0.16	<ul style="list-style-type: none"> ▪ RegTP did not regulate TFs, only total transit cost of phone calls (Telekom 0.3 Service) ▪ Detailed price structure of Telekom 0.3 Service not publicly available, therefore difficult to establish specific cost of TFs. Price reductions the result of bi-lateral agreements among MNOs and FNOs and reductions in peak rates to off-peak levels ▪ As of 2007, Bundesnetzagentur (BNetzA), the Federal Network Agency, must approve FiM TFs in Germany 	<ul style="list-style-type: none"> ▪ RegTP was happy with the level of competition exhibited in the German mobile market ▪ German mobile transit costs were 10% lower than those in the UK even in the absence of TF regulation ▪ Introducing regulation would have been unfair to new entrants into the MNO market as their financial forecasts were based on existing unregulated environment 	<ul style="list-style-type: none"> ▪ Prof. Mark Armstrong of Oxford University argues that even in a market where MNOs compete vigorously for subscribers, they still enjoy a monopoly in providing termination services. Therefore, MNOs could earn monopolistic revenues from TFs and use these revenues to lower retail prices in order to attract more subscribers. Prof. Armstrong argues that TFs should be based on cost, plus a factor to account for network externalities (as seen in the UK) 	<ul style="list-style-type: none"> ▪ MNOs generally support non-regulatory environment. Newer MNOs fear regulation would have a disproportionately negative impact on their finances ▪ FNOs argue that non-regulation fosters non-competitive behaviour in MNO market



IRELAND COMMISSION FOR COMMUNICATION REGULATION (COMREG) (2004-2007)					
	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 1.02 People/ Mobile Phone 2. GDP/Capita: \$44,676 3. Inflation: 3.0% (2006-07) 4. MNO Revenue/ Subscriber: \$570 5. MNOs: 4 6. Teledensity: 150 7. Mobile % Telecom Revenues: 47% 8. MNO % Market Share: 49-38-13 9. Termination Fee / Minute: 0.23	<ul style="list-style-type: none"> ▪ In 2004, MNOs Vodafone, O2, and Meteor designated as having SMP in wholesale mobile termination market and resolved to impose 'obligations' including system access requirements, cost transparency, non-discrimination and cost-oriented pricing based on a LRIC model. In August 2007, Vodafone, O2 and Meteor agreed to a glide path whereby TFs would be reduced to an average of 0.799€/min by January 2012 	<ul style="list-style-type: none"> ▪ MNOs were determined to have SMP based primarily on several characteristics of the mobile market in Ireland. i) Consumer ignorance of termination rates and consumer apathy regarding the termination rates charged to others. ii) The lack of viable alternatives to mobile voice calling (fixed-line calling, 'texting', VoIP etc.). iii) The lack of countervailing bargaining/buyer power (CBP) on the part of those who pay TFs (FNOs) 	<ul style="list-style-type: none"> ▪ Ken Binmore and David Harbord argue in <i>The Journal of Competition Law and Economics</i> that FNOs do not lack CBP, as neither party has an alternative to mutual interconnection in order to terminate shared calls. As evidence they cite past examples, notably in the UK and Europe, where FNOs have refused to pay TFs to 3G MNOs that were higher than those TFs already paid to 2G MNOs. As such, Binmore and Harbord dismiss the assertion that FNOs lack CBP, and therefore dismiss the need for regulated TFs in order to protect FNOs and their customers. 	<ul style="list-style-type: none"> ▪ Vodafone and O2 proposed a reduction in TFs of 3.5% (in nominal terms) for each of the five years from 2008-2012
		<ul style="list-style-type: none"> ▪ In 2007, Hutchinson 3G designated as having SMP in call termination on its 3G network, and ComReg determined Hutchinson should be subject to the same 'obligations' as those prescribed for Vodafone, O2, and Meteor 	<ul style="list-style-type: none"> ▪ 'Obligations' to be imposed on MNOs were based on those outlined in Article 8(2) of European Commission Access Directive 		<ul style="list-style-type: none"> ▪ Meteor committed to reduce their TFs by 5% in 2008 and 2009 to be followed by 6.5%, 10.5% and 13% reductions in 2010, 2011 and 2012 respectively



JAPAN MINISTRY OF PUBLIC MANAGEMENT, HOME AFFAIRS, POSTS, AND TELECOMMUNICATIONS (MPHPT) DECISION (2002)

	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 1.35 People/ Mobile Phone 2. GDP/Capita: \$32,530 3. Inflation: -0.03% (2005-07) 4. MNO Revenue/Subscriber: \$850 5. MNOs: 17 6. Teledensity: 132 7. Mobile % Telecom Revenues: 58% 8. MNO % Market Share: 53-24-16-3 9. Termination Fee / Minute: 0.11	<ul style="list-style-type: none"> ▪ Although Japanese TFs lower than those in the EU or Australia, MPHPT responded to pressure from United States Trade Representative (USTR) to lower TFs further ▪ MPHPT worked with MNOs to reach a voluntary reduction in MtM TFs over 2 years of 12.5% and 5.5% respectively with option to regulate if TFs were to rise to an 'unreasonable' level ▪ MPHPT granted some FNOs power to set FtM TFs pending further in-depth review of FtM TFs 	<ul style="list-style-type: none"> ▪ Direct regulation unnecessary due to the low TFs already in place and conciliatory approach of Japanese MNOs ▪ Allowing FNOs to set interim FtM TFs ensured low FtM TFs while MPHPT studied the issue further 	<ul style="list-style-type: none"> ▪ Prof. James Mirlees of U of Cambridge argues that minimally regulated or unregulated are of greatest welfare benefit, both to consumers, who enjoy benefits of lower mobile rates through competition among MNOs and MNOs, who benefit from increased subscriptions and revenue 	<ul style="list-style-type: none"> ▪ MNOs expressed concern that allowing FNOs to set their FtM termination fees could have a profound negative effect on their revenues ▪ MNOs argued that the emergence of VOIP phones would naturally constrain FtM TFs. ▪ In response to USTR pressure: High cost of international calls mostly comes from int. carrier surcharges, not TFs.



MALAYSIA MALAYSIA COMMUNICATIONS AND MULTIMEDIA COMMISSION (MCMC) - PUBLIC ENQUIRY PAPER ON ACCESS PRICING (2005)					
	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 0.13 People / Mobile Phone 2. GDP/Capita: \$15,042 3. Inflation : 3% (2005) 4. MNO Revenue Per Subscriber: \$267 5. MNOs: 3 6. Teledensity: 17 7. Mobile Revenues as percentage of total sector revenues: 56% 8. MNO Market Share: 41-38-21	<ul style="list-style-type: none"> ▪ TFs are a 'bottleneck' service (a service that is essential and cannot be duplicated by a competitor) in which MNOs have SMP. ▪ 'Bottleneck' services should be subject to cost-based price regulation. 	<ul style="list-style-type: none"> ▪ SMP determined according to 2004 inquiry according to market structure, competition and barriers to entry. 'Bottleneck' services defined in same legislation and applies to a number of services in addition to TFs. 	<ul style="list-style-type: none"> ▪ Andrew Dymond wrote in <i>Telecommunications Challenges in Developing Countries</i> that high termination fees could have a positive downstream effect by enticing operators to offer more termination-fee generating services, benefitting the consumer. 	<ul style="list-style-type: none"> ▪ Celco argued LRIC does not allow for full cost recovery. The other MNO's and FNO agreed to LRIC pricing in principle but differed in their opinions of the exact methodology that should be used in developing a LRIC model.
		<ul style="list-style-type: none"> ▪ TFs to be regulated according to a LRIC model for a fixed period of three years. 	<ul style="list-style-type: none"> ▪ LRIC pricing, although mostly used in developed countries, was seen to be easily adapted to fit the particular circumstances in Malaysia. 		



PAKISTAN TELECOMMUNICATIONS AUTHORITY DETERMINATION (2005)

	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 3.36 People/ Mobile Phone 2. GDP/Capita: \$2,744 3. Inflation: 8.6% (2004-2006) 4. MNO Revenue / Subscriber: \$63 5. MNOs: 4 6. Teledensity: 53 7. Mobile % Telecom Revenues: 48% 8. MNO % Market Share: 40-21-19-17 9. Termination Fee / Minute: 0.03	<ul style="list-style-type: none"> ▪ Mobile Termination Rates (MTRs) were 46-68% in excess of 'fair' price. ▪ Prices for MTRs should be set according to a LRIC model, and be subject to a two-step reduction: 45% immediately and an additional 20% in one year ▪ Only costs directly or indirectly caused by Mobile Termination (MT) services to be considered in setting 'fair' MTRs ▪ Both MiM and FiM MTRs to be set at a single rate, billed on a per-second basis 	<ul style="list-style-type: none"> ▪ Cost estimates for MTRs provided by mobile providers included large provisions for costs unrelated to MT services, violating the 'cost-causation' principle ▪ A provision for network externality benefits is subjective and not applicable due to the nature of the Pakistani economy ▪ Anticipated growth in mobile telephony due to reduced MTR should more than offset associated loss of revenue for mobile service providers ▪ Info needed for alternative pricing methods lack objectivity and/or reliability as mobile providers are not publicly-listed companies 	<ul style="list-style-type: none"> ▪ Prof. Julian Wright of U of Auckland determined that above-cost MTRs are beneficial in increasing market penetration through resultant low customer rates as MNOs compete for subscribers. Wright suggests allowing FNOs to set MTRs or allowing FNOs ability to negotiate their own MTRs as preferable, non-regulatory measures to keep MTRs at a reasonable price 	<ul style="list-style-type: none"> ▪ Established MNOs wanted MTRs to include provisions for sunk costs (licenses, marketing etc.) included in calculating cost of termination services ▪ New MNO licensees did not want a change in MTRs as it would adversely affect their financial outlook, and unfairly favour MNOs with established networks and client bases



REPUBLIC OF KOREA KOREA COMMUNICATIONS COMMISSION (KCC, (2004-2006))					
	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 1.25 People / Mobile Phone 2. GDP/Capita: \$16,443 3. Inflation : 2.75% (2005) 4. MNO Revenue Per Subscriber: \$460 5. MNOs: 3 6. Teledensity: 49 7. Mobile Revenues as percentage of total sector revenues: 47% 8. MNO Market Share: 51-32- 9. Termination Fee / Minute: 0.06	<ul style="list-style-type: none"> ▪ Up to 2004, termination rates were regulated according to historical cost or fully distributed cost (FDC) basis. ▪ After 2004, The Korean Communications Commission directly determined termination rates for each MNO according to a LRIC-based framework. The Korea Communications Commission publishes the exact methods by which call termination prices will be determined for each year. 	<ul style="list-style-type: none"> ▪ LRIC-based regulation better reflects the true cost of call termination as it excludes other fixed costs from the calculation of the cost of termination. ▪ Emphasis is placed on making policy consistent. Accordingly, both termination rates and system access fees are determined according to the same 'efficient cost' method. ▪ To encourage development, regulatory provisions will be made for MNO investment in 3G networks when determining MNO costs. 	<ul style="list-style-type: none"> ▪ Seon-Kyou Choi, Myeong-Ho Lee and Gyu-Hwa Chung of the University of Communications (S. Korea) wrote in <i>Telecommunications Policy</i> No. 25, Issue 1-2 that the Korean mobile telephone market is not price-competitive as a result of regulatory barriers. They argue that without complete de-regulation of the Korean mobile telephone market, the mobile market will remain uncompetitive and will risk quality over-provision and poor financial performance by Korean MNOs, resulting in high mobile prices, which would ultimately harm the Korean consumer. 	<ul style="list-style-type: none"> ▪ SK Telecom, the largest MNO, hired an independent consultant to assist them in producing a 'hybrid LRIC' model that would, in their opinion, better reflect the cost of fixed infrastructure than the 'bottom-up' LRIC model espoused by the KCC.



TANZANIA TANZANIA COMMUNICATIONS REGULATORY AUTHORITY (TCRA) (2007), INTERCONNECTION DETERMINATION No. 2, 2007					
	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 4.59 People / Mobile Phone 2. GDP/Capita: \$1,256 3. Inflation : 9% (2007) 4. MNO Revenue Per Subscriber: \$58 5. MNOs: 6 6. Teledensity: 22 7. Mobile Revenues as percentage of total sector revenues: 76%* 8. MNO Market Share: 48-29-13-7-3 9. Termination Fee / Minute: 0.08	<ul style="list-style-type: none"> Originally based on interconnection agreements between operators, TFs now determined by regulator based on a LRIC model and a Weighted Average Cost of Capital of 22%. 	<ul style="list-style-type: none"> LRIC-based TFs protect customers, promote competition among MNOs and encourage new entrants to the mobile market. 	<ul style="list-style-type: none"> Jerome Bezzina of the World Bank wrote in <i>Policy Implications for African Telecommunications Regulators</i> (2005) that, in order to create a competitive and fair telecommunications market, emphasis needs to be placed on increasing teledensity in nations such as Tanzania, and enacting efficient and effective measures that can be enforced. Regulatory effectiveness is of particular importance in Africa, where Bezzina asserts a gap between nominal and 'real' regulatory power exists. 	<ul style="list-style-type: none"> Vodacom, the largest MNO, complained that there was not enough time given to prepare a submission outlining their views.
<ul style="list-style-type: none"> One termination rate to be applied to all NOs. Reduction to a TF of 7.16 US¢ to be achieved via a 5-year glide path. 		<ul style="list-style-type: none"> There are both positive and negative elements of mobile phone ownership, therefore a mark-up for externality benefits is not applicable. 			
<ul style="list-style-type: none"> No mark-up for externality benefits to be included in regulated TF level. 					



TURKEY TURKISH TELECOMMUNICATIONS AUTHORITY (TTA) (2006)

	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 1.62 People/ Mobile Phone 2. GDP/Capita: \$9,240 3. Inflation: 10.7% (2003-07) 4. MNO Revenue/ Subscriber: \$140 5. MNOs: 3 6. Teledensity: 88 7. Mobile % Telecom Revenues: 52% 8. % Market Share: 63-22-15 9. Termination Fee / Minute: 0.13	<ul style="list-style-type: none"> ▪ TFs are negotiated and agreed upon between commercial operators (MNOs and the FNO). If negotiation fails after three months, then TA may be asked to arbitrate the dispute ▪ If asked to arbitrate, TA determines appropriate TF terms, conditions and prices based on information/documents provided by both parties and delivers verdict within four months 	<ul style="list-style-type: none"> ▪ TFs are to be cost-oriented for telecom providers deemed to have SMP, which includes the FNO and all three current MNOs ▪ If TA feels that commercially-agreed rates are not cost oriented, TA may request proof of cost-orientation in setting TFs ▪ If it is determined that TFs are not cost oriented, TA may take action to regulate TFs 	<ul style="list-style-type: none"> ▪ Fahri Ulusoy and Dr. Izak Atiyas of Sabanci University argue that regulation must focus on curtailing the disproportionate power that the single FNO, Turk Telecom, enjoys if TFs are to be regulated through commercial agreements. Dr. Atiyas notes that FtM rates in Turkey are at low level comparable to those in Europe, only MtF TFs are higher than global averages 	<ul style="list-style-type: none"> ▪ MNOs objected to a 2003 court decision in favour of setting symmetric FtM, MtF and MtM TFs on the grounds that mobile networks were more expensive to build and operate, and therefore justified higher FtM TFs. Although the current arrangement is deemed preferable to price symmetry, MNOs argue that they lack CBP compared with the single FNO, which also owns a stake in one of the three MNOs



UK COMPETITION COMMISSION DECISION (2003)

	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 0.99 People/ Mobile Phone 2. GDP/Capita: \$35, 3. Inflation: 2.3% (2005-07) 4. MNO Revenue/Subscriber: \$380 5. MNOs: 5 6. Teledensity: 170 7. Mobile % Telecom Revenues: 49% 8. MNO % Market Share: 26-23-23-22-5 9. Termination Fee / Minute (\$US, Avg. Peak): 0.28	<ul style="list-style-type: none"> ▪ Termination Fees (TFs) were 30-40% in excess of 'reasonable' price with no incentive to lower them in the absence of regulation ▪ TFs best regulated by an immediate 15% price reduction with further reductions to follow, based partly on mobile provider's size and according to a Long-Run Incremental Cost (LRIC) model 	<ul style="list-style-type: none"> ▪ Consumers should only pay for the costs they cause, plus a small mark-up to account for fixed and common costs and network externality benefits ▪ Excessive TFs constitute an indirect subsidy to some mobile phone customers at the expense of those who make many FtM or MtM calls 	<ul style="list-style-type: none"> ▪ Yale Journal on Regulation study (Crandall & Sidak) concluded that TFs need to be kept at a reasonable level, but preferred a different solution: instituting a change from the existing Calling-Party Pays (CPP) billing system to the Mobile-Party Pays (MPP) system. Under a CPP system, high TFs are caused by customer ignorance regarding the high price of call termination. Switching to an MPP system results in higher consumer price awareness (as they pay the fees), and is easier than direct regulation 	<ul style="list-style-type: none"> ▪ Regulation is unnecessary in so competitive an industry as the UK mobile phone market ▪ Prices should be evaluated on aggregate, not according to individual components. Overall mobile prices are low and continuously falling



UNITED STATES FEDERAL COMMUNICATIONS COMMISSION (2007)					
	Market Structure	Conclusions/Assertions	Rationale	Academic Perspective	Industry Perspective
	1. 1.38 People/ Mobile Phone 2. GDP/Capita: \$43,223 3. Inflation: 2.1% (2005-07) 4. MNO Revenue/Subscriber: \$420 5. MNOs: 155 6. Teledensity: 120 7. Mobile % Telecom Revenues: 30% 8. MNO % Market Share: 25-24-21-10-5 9. Termination Fee / Minute: 0.13	<ul style="list-style-type: none"> Mobile Party Pays (MPP) Billing system used, whereby a MNO's own customer pays the cost of TFs resulting from incoming and outgoing calls, therefore direct regulation of TFs is unnecessary so long as MNOs and FNOs are able to agree on TF prices 	<ul style="list-style-type: none"> Unlike under the CPP system, MPP subscribers bear the cost of TFs, therefore there is less incentive for MNOs operating in a MPP system to raise TFs as it would raise retail prices paid by customers, resulting in loss of customers and therefore revenue Fs are typically 'bundled' into calling plans that allow customers a certain number of minutes at a certain cost per minute. Competitive pressures to offer the lowest rates ensures that TFs remain at a reasonable level 	<ul style="list-style-type: none"> Prof. Jerry Hausman of MIT notes that 'bundle' plans have tempered MPP subscribers' reluctance to use mobile phones. Hausman further argues that high TFs, under MPP or CPP systems, are caused by customer ignorance and could therefore be solved by informing customers of the rates they pay for termination services 	<ul style="list-style-type: none"> Some MNOs favour abandoning the MPP system in favour of CPP, likely as a means of increasing revenue through the higher TFs associated with the CPP system Many MNOs generally content with current largely deregulated environment under the MPP system



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MARKET STRUCTURE DATA

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- 2) GDP/Capita (PPP): IMF figures (2006)
- 3) Inflation Rate:
 - Turkey: Turkish Consulate (UK)
 - UK: Eurostat
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 - Germany: Eurostat
 - France: Eurostat
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