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Conference Paper

Freemium Internet: Next Generation Business Model to connect next billion

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Title: Freemium Internet - Next Generation Business Model to connect next billion Steve Esselaar, Steve Song and Christoph Stork

Keywords: Universal Service, Next Billion, business models

Abstract:

This paper analyses a business model for providing free basic-rate Internet to everyone with a data capable phone, living in mobile coverage areas. The model is called Freemium Internet. The term “freemium” refers to a well-known business model for digital services, where free services or applications provide basic functions and more advanced functions are available by paying a fee. We examine the impact of applying the freemium business model to the provision of mobile Internet access and discuss net neutrality issues, mobile operator strategies, benefits for consumers, and the potential impact on government e-service programmes. The paper further investigates policy options and regulatory incentives to facilitate the adoption of Freemium Internet.

1. Introduction

The skills required to use the Internet have been dramatically reduced by the arrival of mobile broadband in Africa.¹ Using a browser or search engine on a mobile phone does not require formal ICT training or knowledge of how to install anti-virus software. The affordability barrier has also been reduced compared to the wired-only Internet age, where the equipment to use the Internet was expensive (computer or laptop) and required reliable electricity at home, two things most Africans today still cannot afford. Smart and feature phones are available at a much lower cost and can be charged by solar, car battery and other ways.

While 90% of the population in Africa is currently covered by 2G signal, only about 20% use the Internet. This has many reasons. One reason that would be addressed by Freemium Mobile Internet is that data in many countries it is expensive to use and poor people are afraid of trying out the Internet as it may use up their precious airtime. Cost can be managed for a call or an SMS but it is more difficult to manage the cost of data: Sudden software updates or a click on the wrong link may wipe out the data budget for the week or month.²

¹ While Freemium Internet is suitable for developing countries in general we mostly focus on Africa due to our work and hence access to data. We rely on experiences in India and Malaysia for African policy makers and regulators.

² See Text Box 1 with a response of Investor Relations of DIGI (27 June 2017) with regard to the rationale for Free Basic Internet.

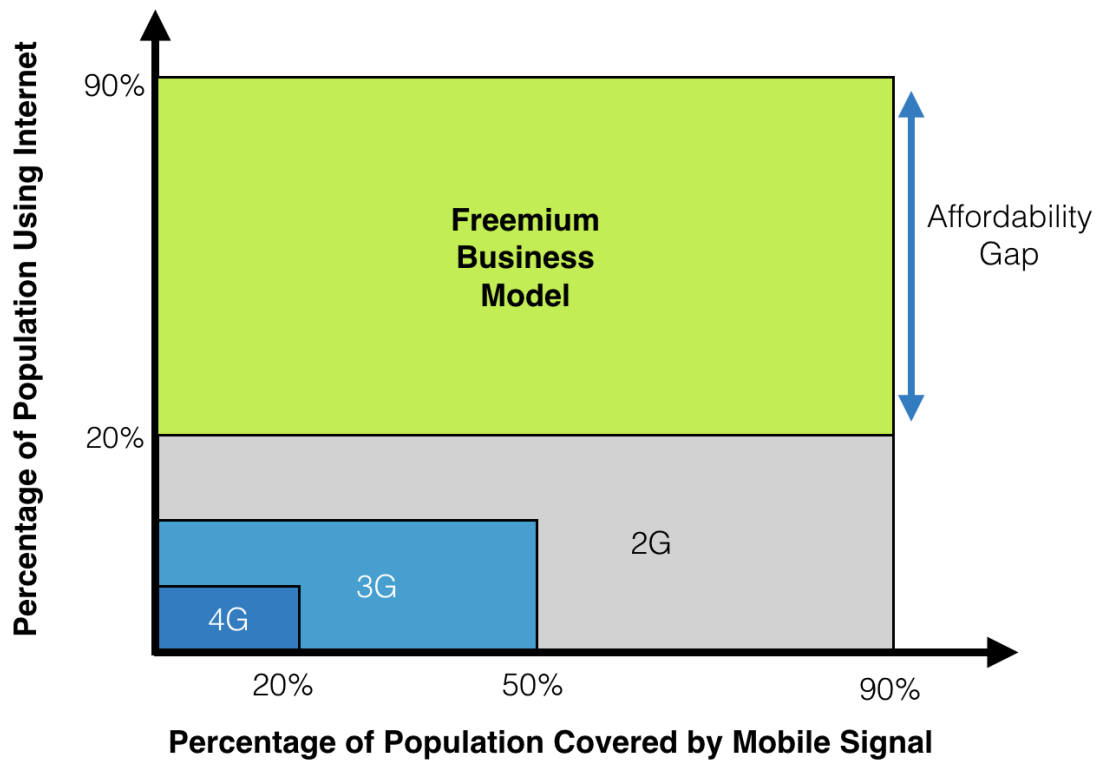


Figure 1: Freemium Internet: Connecting everyone to the Internet

Freemium Internet would allow those that currently live within the mobile coverage area to explore the Internet without the risk of budget shock. The idea is to provide free basic-rate³ Internet service to everyone. This would have the impact of immediately transforming the number of data subscribers from the current 20% levels to 90% (Figure 1). While it is easy to see the benefits for consumers, in order for Freemium Internet to be adopted, it would need to serve the business interests of mobile network operators.

Text Box 1: Investor Relations of DIGI (27 June 2017):

“The rationale for Free Basic Internet (FBI) for Prepaid customers is to enable customers to have the flexibility of having “Always On” internet access for social messaging services and mitigate bill shock. This is important to give prepaid customers a worry free internet experience and drive higher internet adoption among the prepaid customers who represents more than 80% of the mobile customers in Malaysia.

This FBI feature is designed for a speed of 64kbps thus for customers who require high speed internet for their other digital needs, then they will have to purchase internet passes options which are affordable for daily/weekly/monthly basis.

We have more than 64% of prepaid customers who are active internet users and internet revenue from them contributed to more than one third of the total prepaid revenue.”

³ Basic-rate refers a best-effort service that would offer speeds similar to that which may be experienced on a 2G network e.g roughly 64kbps.

The freemium business model is well established for mobile applications as well as Internet services, where basic use is free but the user has to pay for advanced features. The same model applies to Freemium Internet: basic-rate Internet is free and subscribers have to pay for faster access.

Freemium Internet would be fast enough for basic interactions and public services such as e-gov, e-health, e-farming and e-education, but not fast enough for making VoIP calls or multimedia content. Various stakeholders would benefit from Freemium Internet:

- **Citizens in general and the poor in particular:** Free access to the Internet would allow the poor to experiment and discover online valuable services without compromising their limited resources;
- **Mobile Operators:** In Malaysia, where Freemium Internet-like services have been implemented, data revenues have shown strong growth;
- **Governments:** Freemium Internet would significantly leverage millions of dollars spent on e-government services by dramatically expanding their reach and enabling equitable access to those who need it most.
- **Economy:** Positive impacts on GDP growth and job creation.

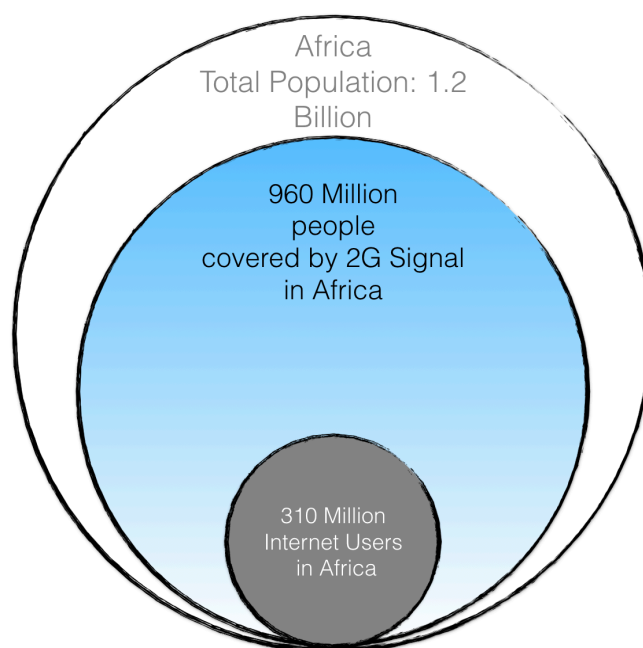


Figure 2: Universal Service Challenge - Internet (GSMA data for Q4 2016)

In Africa, less than a third of people covered by mobile signal use the Internet (Figure 2). This paper argues that by removing the affordability obstacle, and providing always-on connectivity, the number of people can use the Internet can be rapidly and exponentially increased.

2. Freemium Internet vs Free Basics

Facebook offers Free Basics⁴ as a zero rated⁵ suite of Internet services; principally Facebook itself but also a range of other services and applications. In 2016, less than two years after its introduction, this service was rejected by the Indian regulator because content was limited to Facebook and a select suite of other services.⁶ The consequence of this decision is that the cost of communication is now higher in India because access to even basic messaging services like Facebook Messenger, WeChat, or WhatsApp requires the subscriber to have purchased a data plan.

	Free Basics	Freemium Internet
What is free	zero rated content	Internet access
Content	controlled by Facebook	open
Speed	any	2G speeds, eg up to 64 kbps
Initiated	MNO	MNO / Regulator
Defaults	Facebook	None

While Free Basics is also a freemium model, restricted content for free, open content at a fee, Freemium Internet as proposed in this paper does not restrict content. General access to the Internet is free, in our model, for speeds up to 64kbps. Faster speeds are payable. As such, the Freemium Internet model proposed in this paper is net neutral. Speed is something the Internet user can choose based on what he can afford and it does not link speed to specific services (which would be a net neutrality issue).

More and more influence is attributed to social media platforms in terms of their public opinion and political processes. The lack of transparency through which news is filtered to citizens through social media platforms make the importance of consumer choice in platforms ever more critical, unencumbered by defaults set by zero-rated programs that target specific platforms.

3. Next Generation Business Model

This section analyses how the Freemium Internet fits in with current global trends⁷ and analyses the technical and practical implementation issues for mobile operators. Two trends are discussed here:

- The transition from regular voice and SMS services to Over The Top (OTT) services;
- The value of non-telco OTT services.

⁴ <https://info.Internet.org/en/story/free-basics-from-Internet-org/>

⁵ Zero-rating refers to network operators offering customers free access to specific applications or Internet services on an otherwise metered data network

⁶ <https://www.theguardian.com/technology/2016/feb/08/india-facebook-free-basics-net-neutrality-row>

⁷ See Stork et al, (2016) for global trends and Christian (2017) on declining international voice traffic.

3.1. Transition from regular voice and SMS services to OTT

Deloitte (2016) predicted that a quarter of smartphone users in developed markets will not make any traditional voice calls in a given week in 2016. Instead, calls are made with OTTs like Skype, WhatsApp and FaceTime and texts are sent with messaging applications like Facebook Messenger and WhatsApp. Christian (2017) marked 2015 as the turning point for international voice growth, which turned negative for the first time since the Great Depression. He argues that the decline is a permanent structural shift due to the mass adoption of OTTs.

INTERNATIONAL CARRIER AND OTT TRAFFIC, 2004-2016

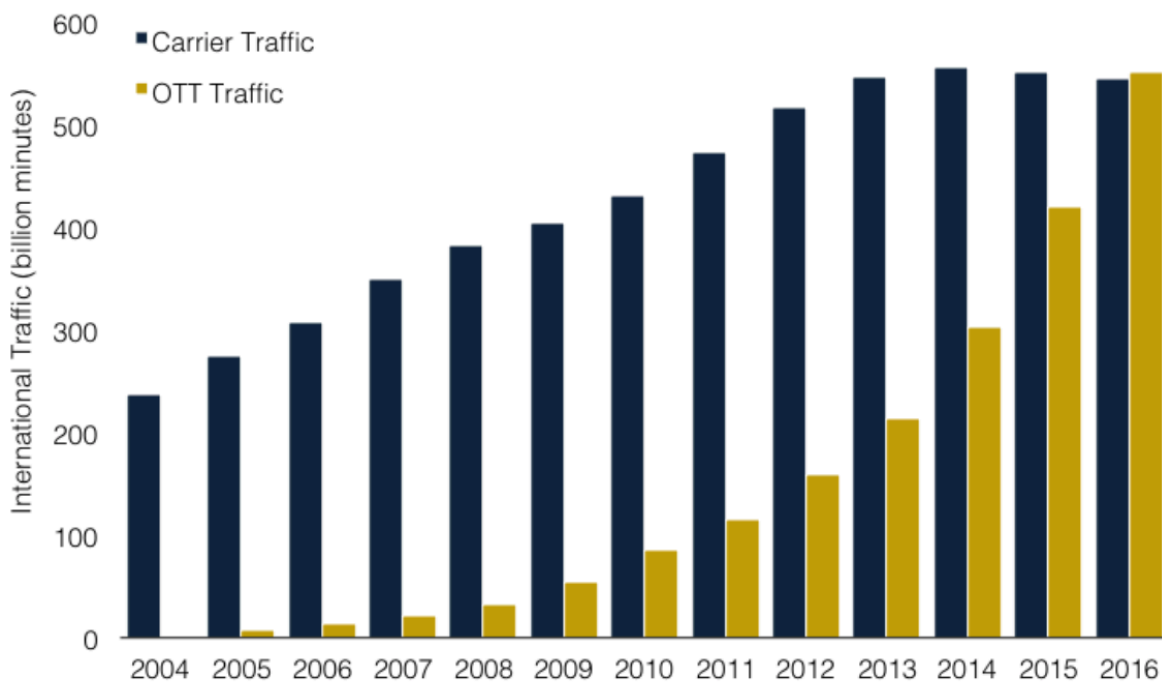


Figure 3: Carrier vs OTT traffic (Source Telegeography)⁸

Figure 3 shows that, in terms of traffic, OTTs overtook regular carrier traffic in 2016 for the first time.

We predict that OTTs will replace regular voice and messaging services in the near future. Figure 4 depicts the transition from traditional to data access only services, which rely on OTTs for communication. The x-axis is an average period of time because some countries may reach a phase sooner than others, and some countries will lag behind these trends for a longer period of time, depending on the level of competition within the ICT sector of each country.

⁸ <https://www.telegeography.com/research-services/telegeography-report-database/>

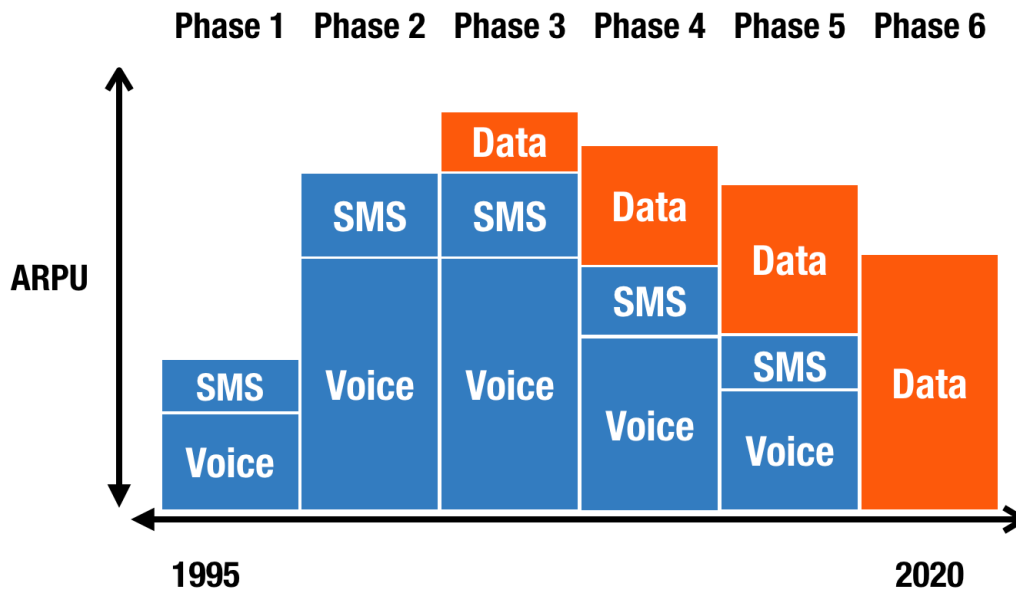


Figure 4: Trends towards "Access" only business models (source: Authors' own graphic)

The general trend is a shift away from analog voice and SMS revenues towards data revenues, driven by OTT services, such as social media and other IP-based services, which will be increasingly used for voice and message communication. The trend described in Figure 4 depends on smartphone penetration and 3G+ network coverage. The migration to a data-only business model will take longer for countries that have little 3G and 4G coverage and low smart phone penetration.

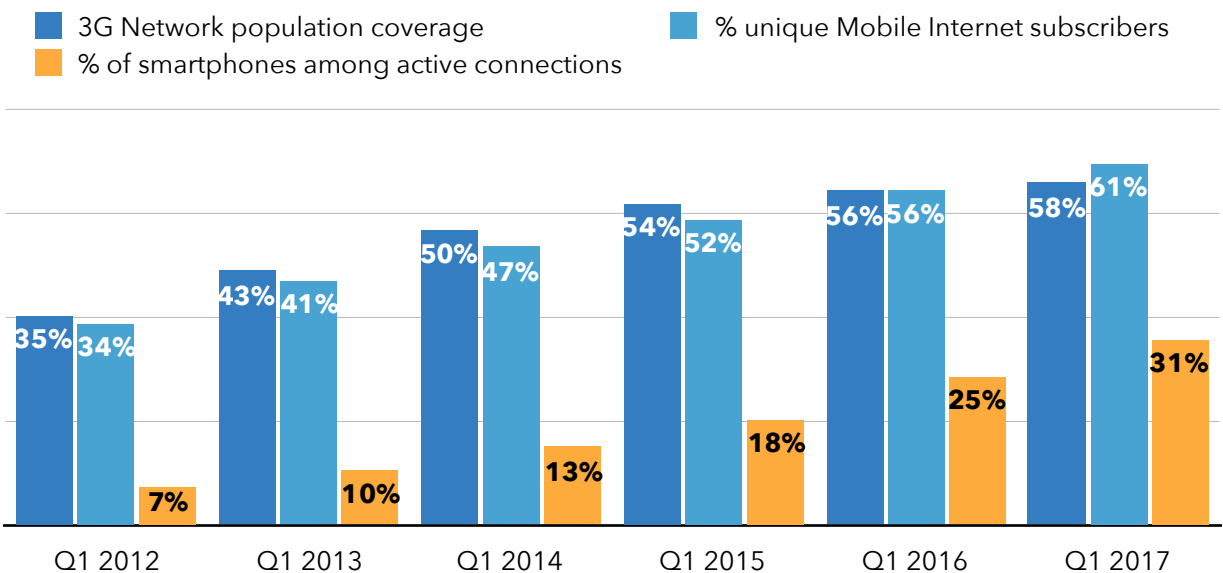


Figure 5: Next business generation model indicators for Africa (Source GSMA Intelligence)

Figure 5 shows that mobile Internet subscribers track 3G network coverage in Africa and even slightly exceed it, which is possible since EDGE (2.5G) networks are enough for basic mobile Internet. Smartphone penetration among active users is slower to catch up with network

coverage mostly due to the cost of smartphone handsets.⁹ In Africa, a third of active connections were using a smartphone. The actual number of unique users is thus higher by a third since there are many more active SIM cards in circulation than there are unique subscribers.

Mobile operators will eventually become “access” providers¹⁰, distinguishing their products simply by speed and quality of service, and competing with other forms of access, such as Public WiFi and connectivity in places of work, study and home.

As OTTs become the dominant form of communication, billing and marketing functions rapidly simplify - one MB of data is easier to bill, as opposed to voice, data and SMS billing, which is dependent on destination and time of day.

Operating costs can be lessened by reducing both the number of retail locations and commissions to agents, since there would only be one product to sell, namely data.¹¹ The Authors predict that a significant number of mobile operators will have transitioned to the Access + OTT Phase 6 by 2020.

Table 2: Transition to a next generation business model		
Item	Traditional Voice, SMS and Data business Model	Next Generation Business Model
Services	Voice, SMS, Data	Data
Billing	Access and usage billing: Detailed billing systems for voice and SMS that can distinguish between off-net / on-net, peak / off-peak	Simple access billing
Traffic Monitoring	Detailed traffic monitoring as part of the billing system	Usage monitoring limited to data use
Post paid subscribers	Detailed vetting to reduce risk or revenue loss and expenses that arise from call termination and subsidised handsets	<ul style="list-style-type: none"> • Postpaid risk limited to revenue of one billing cycle • No external expense risks • Prepaid and postpaid do not need to be distinguished by pricing • Postpaid may be extended without significant vetting

Table 3 compares the traditional business model with the next generation business model.

3.2. The value of OTT to other sectors

Basic-rate data is valuable both to consumers and operators. On the one hand, it grows data subscriber numbers, on the other, it opens up new ways of offering non-telecommunications services to a large number of people. Mobile money and advertisements are obvious examples but there are endless possibilities. The success of Uber in Kenya, Uganda, Nigeria, and South

⁹ Feature phones sales still make up half of total handsets sold in 2016, 120 million out of 215 million total handset sales (<https://www.idc.com/getdoc.jsp?containerId=prCEMA42378517>)

¹⁰ The term “Dumb pipe” has sent shockwaves down the splines of fixed line engineers for many years. A mobile data access provide would better be categories as a smart utility, since the network provides location and QoS data among many other information in the access model.

¹¹ JIO, an Indian operator, launched services based on this model in September 2016. It only offers mobile data services at different speeds and does not charge for voice or SMS, which is left to OTTs. See eg: <http://in.reuters.com/article/reliance-telecoms-jio-idINKCN11611V>

Africa is an example how connectivity can transform a non-ICT sector and lead to more efficient taxi services providing better, cheaper and more secure taxi rides for customers while helping taxi drivers to earn a more predictable income.¹²

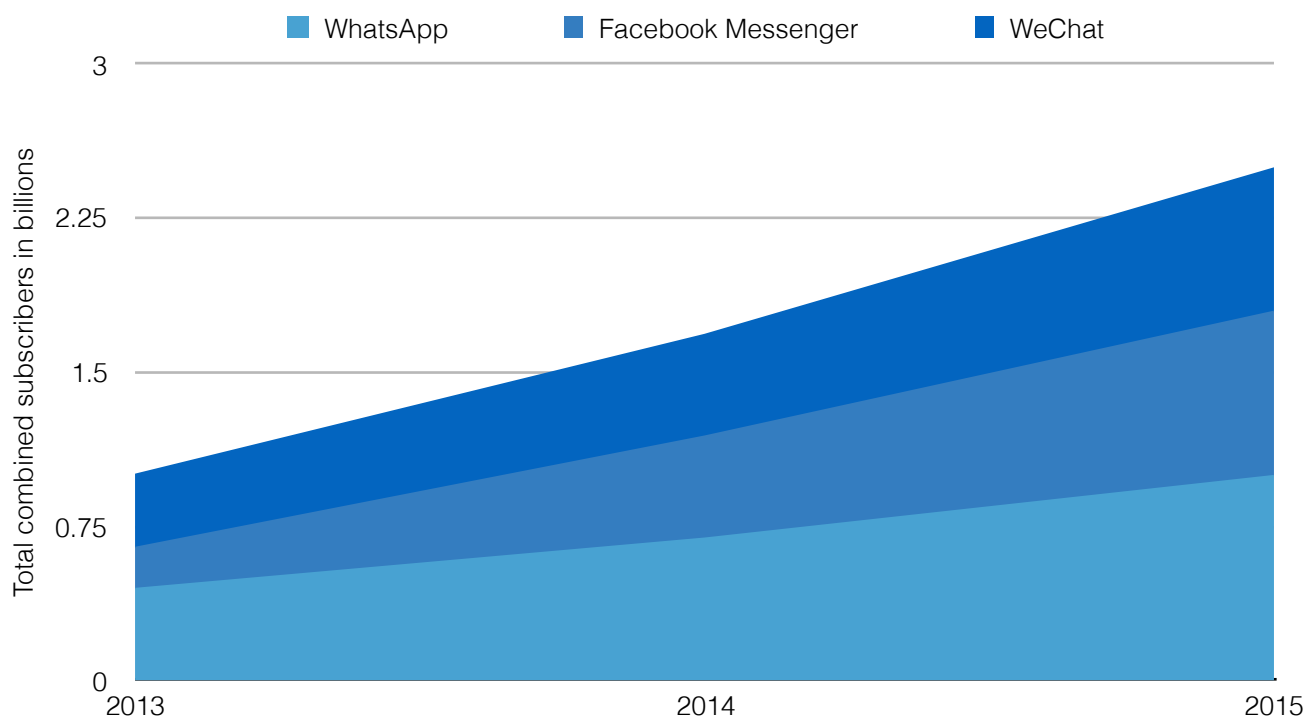


Figure 6: Slow Internet is valuable (Source: Facebook and WeChat)

Figure 6 show the combined growth of WhatsApp, Facebook Messenger and WeChat subscribers. All three are free OTT services that generate revenues from non-telecommunication services.

Mobile operators tend to focus on high net-worth individuals, advertising the increase in network speeds. It is easier to get an existing subscriber to increase their data usage than to convert a non-user (Aydin & Özer, 2005). But, from an economic perspective,

"[t]here is a misperception that the economic benefits of broadband require significantly higher speed networks. Contrary to those who insist that gigabit fiber networks are a national imperative, study after study repeatedly shows that the economic benefits of broadband are greatest when adding additional users even if at lower speeds, not upgrading networks to supposedly "future-proofed" technologies. There is a clear and extremely large diminishing marginal utility to additional network speed" (Brake, 2017, p.4).

FMI directly addresses the cost constraint of attracting new data subscribers. In Zambia, for example, over 50% of the population is a mobile voice subscriber, but only 8.3% are data subscribers (Stork et al, 2017, forthcoming). In Africa, as Figure 2 shows, there are 960 million people covered by a 2G signal but only 310 million Internet users.

¹² Interviews with several Uber drivers in Kampala, Nairobi and Cape Town during 2016 and 2017. While Uber rates are cheaper than regular taxis, the drivers saw Uber as very positive since they did not have to wait for rides and also get rides back from where the first ride takes them.

4. Freemium Business Model

Freemium Internet is a business model that accelerates the inevitable transition of network operators to a next-generation data-driven business model. It increases the number of data subscribers and facilitates OTT use. A quick transition to this new model is of advantage for MNOs because it allows them to switch off legacy billing systems and capture significant cost savings.

It remains a challenge to estimate the business impact of Freemium Internet by assessing the direct and indirect revenue impacts, from telecommunications and non-telecommunication revenue sources. Content provided via mobile broadband and the use of mobile networks to link up devices and provide services such as Uber on top of a connectivity platform, all drive data revenues for an MNO. Table 4 shows three types of OTTs that can drive data demand for mobile operators.

Table 3: Different types of Over the Top (OTT) services			
	Communication OTTs	Mobile Content OTTs	Non-Telco OTTs
Description	Applications using VoIP or IP driven instant messaging	Audio, video, and other media over mobile broadband. They may be provided by MNO directly or by third parties.	Sectors other than the telecommunication sector benefiting from an IP based connectivity platform
Examples	WhatsApp, Facebook Messenger, Twitter, Skype, WeChat	Facebook, ringtones, Youtube, Instagram	Uber, Internet of Things (IoT), e-Gov, e-Health, e-Edu, mobile money
Data volume	Significant potential	None: MNO content mostly offered zero-rated	Modest potential
Other revenues	Low potential	Modest potential	Significant potential

Communication OTTs lead to a decrease in voice and SMS revenues while in particular non-telco OTTs provide an attractive revenue source. Mobile money and other financial services are the best example of that. The next section provides a few examples.

4.1. Non-telecommunication revenue - Platforms

An alternative source of revenue from Freemium Internet comes from applications that use Freemium Internet as a platform, such as mobile money and advertising. There are very few examples of where a significant source of revenues is not telco-based, i.e., selling airtime or data. The most successful is M-Pesa in Kenya. Safaricom, M-Pesa's owner, charges transaction fees for mobile money transfers. This model has been enormously successful with M-Pesa revenues twice as large as mobile data revenues (see Figure 7).

■ M-Pesa revenue as share of total ■ Mobile data revenue as share of total

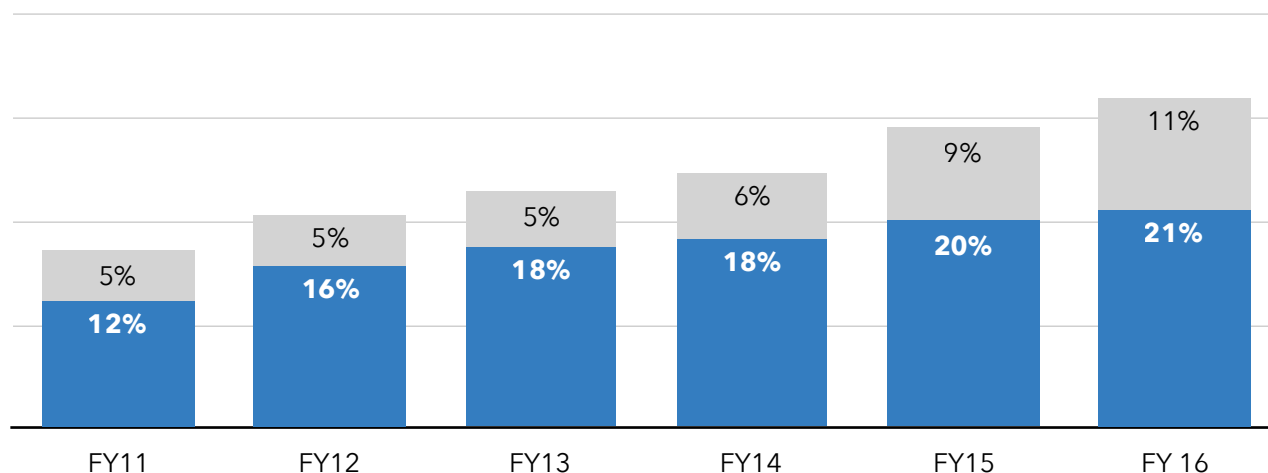


Figure 7: Safaricom’s M-Pesa and mobile data revenues as share of total revenues (Source, audited financial statements)

The ability of mobile operators to manage airtime for their customers, similar to managing money by banks for their clients, provides a host of revenue opportunities including airtime loans, airtime savings accounts, micro insurance and micro venture capital. Similarly mobile money can be used to extend formal financial services to clients. While Safaricom does not offer loans currently, many service providers do via the M-Pesa platform.¹³

4.2. Telecommunication Revenue

Telecommunication revenues would be impacted by Freemium Internet in several ways through the following mechanisms:

- Traditional voice revenues are unlikely to decline through Freemium Internet since 64 kbps or lower is not fast enough for VoIP calling. However, the general trend of falling voice revenues due to OTTs will continue. MNO thus need to think of how to generate additional revenues, which is mostly through data. Freemium Internet widens the subscriber base for data use.
- SMS revenues are likely to decline as they can be easily sent through messaging services like WhatsApp. SMS revenues will decline in either case but the decline may be accelerated by Freemium Internet. In the short term, SMS may still be more reliable in many parts of Africa, in congested or 2G only areas since SMS’s use a different channel than data.
- Data revenues will increase due to:
 1. More subscribers being introduced to mobile data and eventually breaking out of Freemium Internet and becoming regular data subscribers in order to enjoy faster speeds.
 2. The general increase in data consumption per subscriber through cloud services (such as Uber) that require users of that service to use data, transition from voice to video calling and consumption of digital content (Youtube, Facebook etc) will be accelerated.

¹³ <http://www.loans.info.ke/2017/02/safaricom-mpesa-loans.html>

increase in data subscribers. More data subscribers also mean more user generated online content and more data use of existing subscribers.

- Operators with mostly 2G networks and low backhaul capacity may, however, initially see a decline in data revenues through Freemium Internet since their data services are slow and paid mobile broadband may not offer much of an improvement over Freemium Internet. The rate by which subscribers would migrate from Freemium Internet to paid services depends, to a large extent, on the quality of the network.
- Network quality is also the main factor in the level of current data ARPU (average revenue per user) and how much data new subscribers will be consuming, on average.

The expected revenue impact of Freemium Internet would need to be modelled both by country and by operator. However, even when looking at a single operator there are many factors that together influence revenues. Factors include: current customer profiles, network coverage and quality, own prices and promotions, prices and promotions of competitors, branding and economic factors. The paper uses selected case studies of Malaysian operators to derive the potential impact of Freemium Internet in Section 5.

4.3. MNO Profiles for Freemium Internet implementation

This section analyses the suitability of Freemium Internet for three generic profiles of MNOs, based on some of the most important differentiating factors (Table 4).

MNOs with predominantly 2G networks will have to undertake considerable investment to upgrade to 3/4G and increase the backhaul capacity of their 2.5G base stations in order to provide Freemium Internet and benefit from paid data revenue growth. However, these investments are inevitable (i.e., would have take place in any case) and should not be a deciding factor on whether to offer Freemium Internet or not.

MNOs with fully converted 3G/4G networks would not need additional investment to offer Freemium Internet.

Table 4: Freemium Internet implementation profiles			
Profiles	Mostly 2.5G network and poor network quality	Mostly 2.5G network but data channel is under-utilised	Mostly 3G and 4G network or better
Commercial Viability	No	Potentially	Yes
Strategy 1: drive data demand by getting all prepaid customers to use data	No	Yes	Yes
Strategy 2: OTTs will increase data demand	No	Yes	Yes
Strategy 3: Utilise 2G capacity for slow data	No	Yes	Yes
Strategy 4: Drive non-ICT value (e.g. mobile money)	Yes	Yes	Yes
Incentives upgrade to 3G and 4G networks:	Wide ranging incentive framework including spectrum allocations and fibre backhaul networks		Generally conducive investment climate
Direct incentives to offer Freemium Internet	Selected incentives to support faster adoption (foregone USF levies or licence fees or additional spectrum)		

While Freemium Internet can be offered using 2G networks only, the cost profile is significantly higher than 3/4G networks. Nevertheless, it is in the interest of governments and regulators that Freemium Internet is offered in 2G coverage area in order to reach poor people with e-government, e-health and other connectivity driven services.

Two levels of regulatory interventions can be distinguished that may facilitate the offering of Freemium Internet.

- **Incentives upgrade to 3G and 4G networks:** This may include spectrum allocations and initiatives to extend the fibre backhaul networks.
- **Direct incentives to offer Freemium Internet:** This could be in the form of foregone USF levies or licence fees or additional spectrum.

A policy and regulatory incentive framework to offer Freemium Internet is discussed further in section 6.

5. Freemium Internet Case Studies

Several MNOs already offer Freemium Internet-like services in India and Malaysia. The only requirement is an active SIM card, usually defined as having made or received a call or SMS in the last 30 days.

Table 5: Prepaid Freemium Internet implementations in Malaysia and India

	Malaysia				India
	Celcom (Axiata)	Digi	U Mobile	Maxis	Aircel
Smart Phone Penetration Q4 2016	64%	64.7%	NA	76%	
EBITDA margin FY 2016	38.6%	44%	NA	52.8%	NA
Product name	Xpax Free Basic Internet	Free Basic Internet	Free Internet	Hotlink Free social chat	Free Basic Internet
Launch Data	Q4 2016	Q3 2015	Q3 2015	2013	
Associated with prepaid product?	all-new Xpax	Digi Prepaid	Power Prepaid Plan	Hotlink prepaid	Any
Speed	General 64kbps Facebook high speed	64kbps	64kbps	64kbps	initially speed 64kbps for 500MB then 32 kbps
Monthly free data volume	10Gb any Internet + 10GB Facebook	500 MB	2 GB	500 MB	500 MB
Requirements	Active SIM card	Active SIM card	Active SIM card	Active SIM card	150 Rp recharge per month
Limitations	None	No file sharing VoIP, or Internet tethering	None	None	new customers only, 2G networks only
URL	https://www.xpax.com.my/xpax-tnc	goo.gl/Lv0ozk	http://www.u.com.my/tnc/6553	https://goo.gl/jjqbbb	goo.gl/M9sblv and goo.gl/XLG99n

5.1.Aircel and Jio - India

Two mobile operators offer Freemium Internet in India. Aircel to all customers, and Jio for an introductory period. Both test the market and allow each operator to gain a better understanding of the response to Freemium Internet.

Aircel in India does not publish audited financial statements and little is known about the success of introducing Free Basic Internet to new subscribers other than sporadic press briefings. In February 2016 one statement was released saying that it helped Aircel to attain 60% growth in data revenue.¹⁴

The Ericsson Mobility Report (Ericsson, 2017) found that the recent “introductory free data traffic offers in India have pushed up the global traffic noticeably”, and that India added 43 million data users in Q1 2017, largely thanks to Reliance Jio's free data offer. While the Jio offer was only introductory, it demonstrated two important points:

- Free Basic Internet significantly drives up user numbers and data traffic
- Free Basic Internet may be the next hygiene factor: if you don't have it, churn might increase as subscribers move to other operators.

5.2.Maxis - Malaysia

In Malaysia, Maxis was the first to offer Freemium Internet (called Free Basic Internet) on its Hotlink prepaid product in 2013.

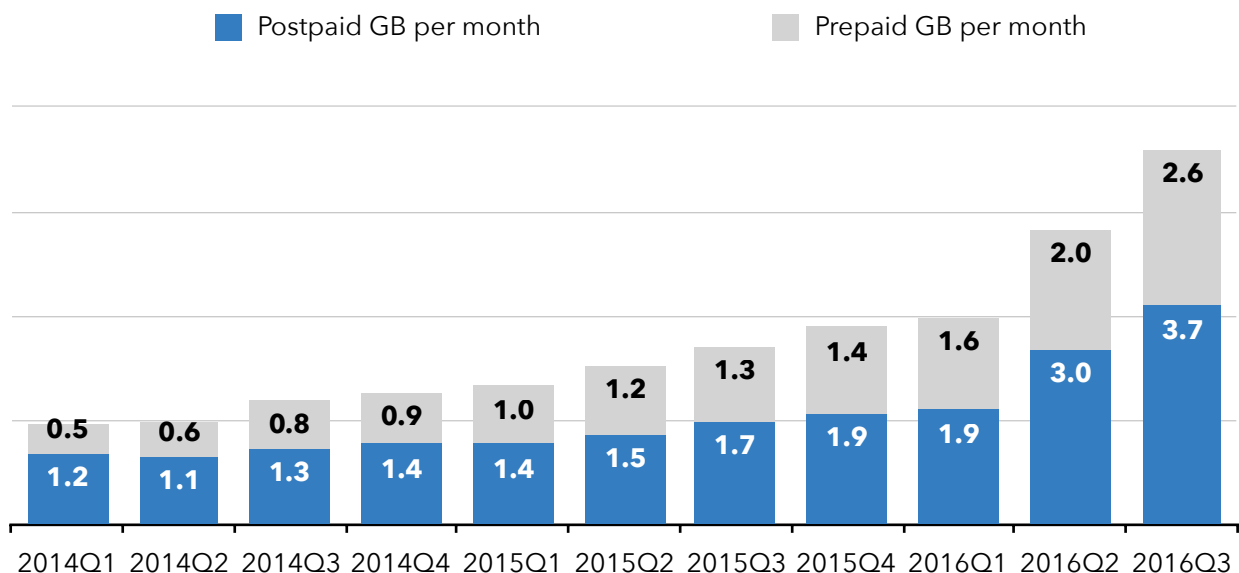


Figure 8: MAXIS growth in data use per subscriber in GB per month (Source: Maxis' quarterly reports)

Data revenues are not reported in Maxi's audited financial report or quarterly investor presentations. However, figure 8 shows that prepaid and postpaid data use per subscriber in GB per month has steadily increased over the last 3 years. Its EBITDA margin of 52.8% in FY 2016

¹⁴ <https://telecomtalk.info/be-online-with-aircel-helped-aircel-to-attain-60-growth-in-data-revenue/149524/>

indicates that it is very profitable and the Free Basic Internet that it introduced can be judged as successful. A further indication of its success is that all of Maxi’s competitors followed suit with similar or better offers by Q4 2016.

5.3.Digi - Malaysia

In Q3 of 2015, Digi along with U Mobile launched Free Basic Internet. Since the introduction of Free Basic Internet, data revenues have grown by 17%.

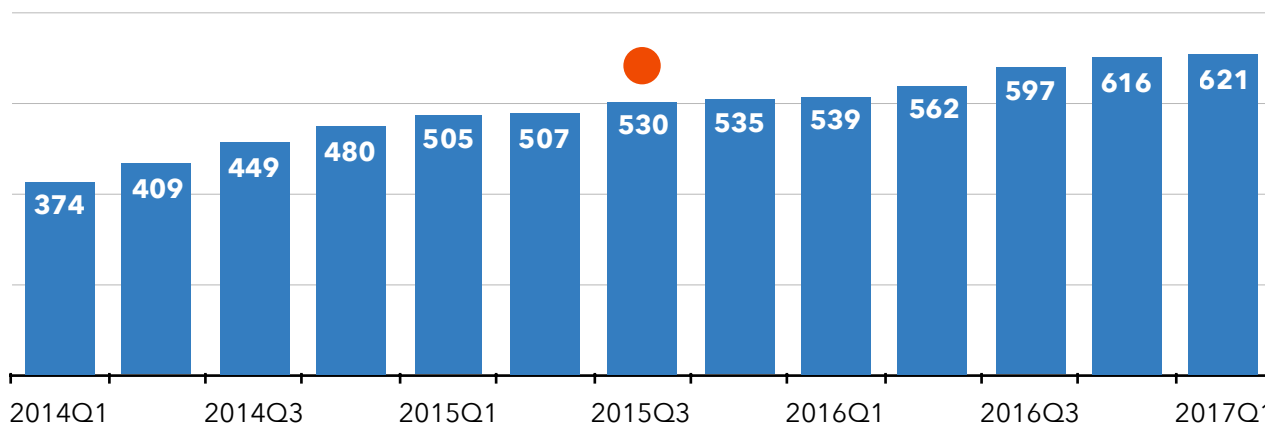


Figure 9: Digi Internet data revenues in RM million (Source: Digi quarterly reports)

At the same time, data usage per subscriber has grown by 233% over the same time period - Q3 2015 to Q1 2017. Digi estimates that data usage per subscriber will top 6GB per user by the end of 2017.

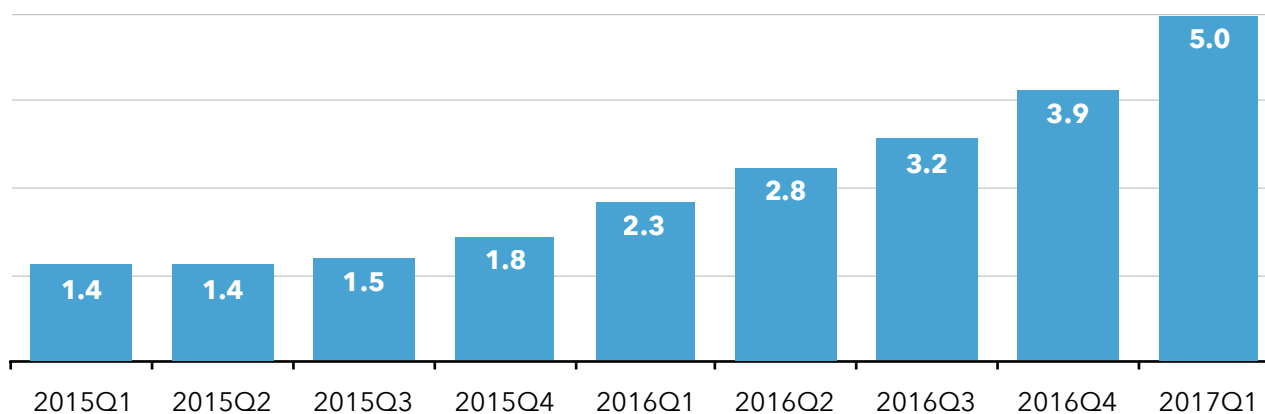


Figure 10: Digi data usage per data subscriber per month in GB (Source: Axiata Financials Q1 2017)

Concerns that Freemium Internet would cannibalise data revenues are unfounded, at least in Malaysia.

5.4.Celcom - Malaysia

Celcom lost 1.7 million subscribers in 2016, 600,000 alone in Q4 2016, which lead to the introduction of Free Basic Internet in order to retain customers¹⁵ in December 2016,, providing always-on, throttled Internet access, limited to a fair use policy of 10GB per month.

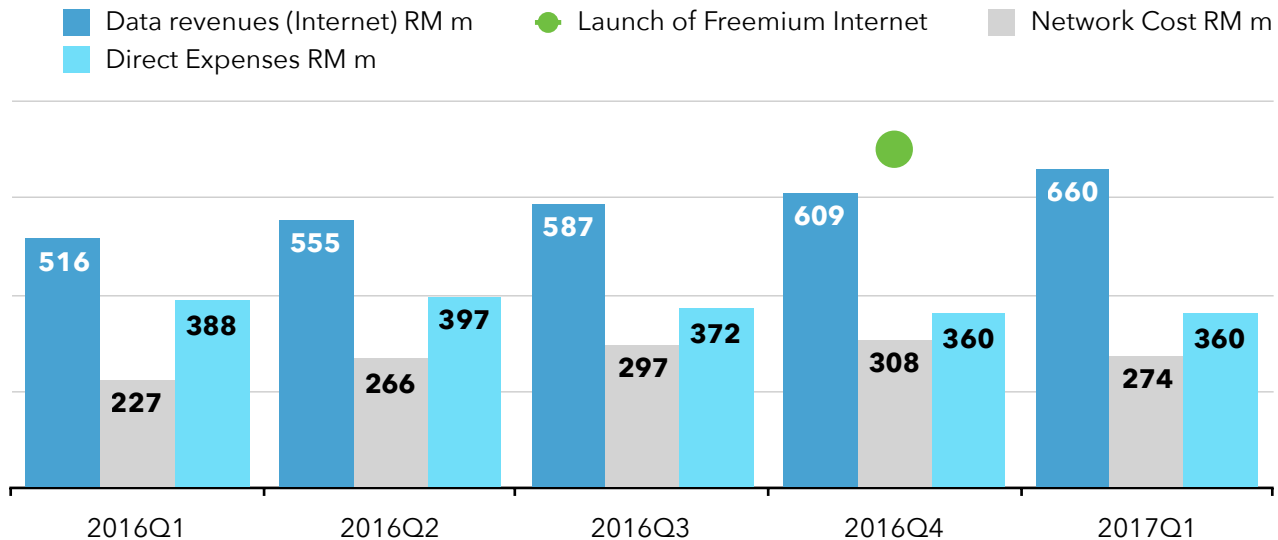


Figure 11: Celcom Internet data revenues in RM million (Source: Celcom quarterly reports)

Data revenues at Celcom have grown 8% since the introduction of Free Basic Internet in Q4 2016. Network costs have remained fairly consistent and have declined from Q4 2016 to Q1 2017. The expectation that Free Basic Internet would drive up network costs and lower data revenues are unfounded.

5.5.Summary

The main observation from these case studies is that Freemium Internet did not lead to lower data revenues. Malaysia shows that one operator offering Freemium Internet leads to other operators following suit in order to limit the initial operator's comparative advantage. Due to competitive pressure, Free Basic Internet has become a pre-requisite for keeping customers loyal, as Celcom has discovered.

6.Incentive Frameworks

Incentive frameworks to offer Freemium Internet will need to be the result of coordinated action between regulators and policy makers. Policy makers provide the overall guidance to regulatory intervention in the market. Universal Service Funds are often separate regulatory agencies yet have valuable funds that could be creatively allocated to Freemium Internet incentives. Table 6 provides an incentive framework for the introduction of Freemium Internet.

¹⁵ <https://www.malaysianwireless.com/2017/02/celcom-subscribers-4q16/>

Table 6: Regulatory and policy incentives			
	Description	Regulatory Impact	MNO Incentive
Reduced USF fee	MNOs are required to contribute to the Universal Service Fund a % of their revenues. These USF levies may be reduced or waived for MNOs offering Freemium Internet.	Lower USF revenues, which may be difficult to implement if controlled by treasury and not the regulator.	Direct monetary benefit to MNOs.
Dedicated Spectrum	Improvements in spectrum management can make valuable 4G spectrum available in selected parts of the country and this can be used to incentivise Freemium Internet	Improved spectrum allocation reduces opportunity cost of inefficient spectrum use at no significant expense to the regulator	MNOs hoard spectrum to prevent other operators from using it. At the same time, the shift to 4G and 5G means that operators that need new spectrum ranges, which will make them open to a dialogue about a new spectrum regime.
Reduced Licence fees	Operators that offer Freemium Internet could be offered a lower service licence fee.	Regulators are unlikely to go this route as it reduces their budgets and therefore power and influence.	Direct monetary benefit to MNOs.
Freemium Internet Licences	Separate licences including spectrum and rollout obligations may be awarded based on the condition that the new MNO offer Freemium Internet.	The regulatory burden is the same as for any other new licence	The New MNO would be limited to the next generation business model strategy but could immediately plan a mix of 4G and Wifi networks.

7. Conclusion

OTT traffic has surpassed carrier traffic. Data usage is increasing rapidly. Voice and SMS revenues are declining quickly and data revenue is becoming the major source of revenue for MNOs. In a data-only environment, MNOs need to find mechanisms to drive data demand in order to drive revenues.

Malaysia shows what the data-only world will look like, with Freemium Internet a basic requirement to retain customers. It showed that data revenues continue to grow and that competitive pressure leads to all operators adopting freemium internet once one major player has done so. In fact, Aircel and Jio show that Freemium Internet can accelerate data and subscriber growth so much that it has an impact on global traffic growth (Ericsson 2017).

Freemium Internet can also drive non-telco OTTs such as advertising, mobile money, and e-Government services using mobile data as a platform. By removing affordability as an obstacle, the number of internet users expands exponentially, enabling the delivery of e-services to all segments of the population instead of only the (relatively) wealthy.

In comparison to Malaysia, mobile networks in Africa are generally not as technically advanced (smaller 3/4G network coverage, lower smartphone penetration) nor as competitive. Where commercial incentives are insufficient, regulatory and policy incentives can be designed, such as the reduction of licence fees, the allocation of spectrum and reduced universal service fees. The impact of these incentives would be to dramatically stimulate data demand to the benefit of consumers, MNOs and a significantly positive effect on economic growth.

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