



Zero-Rating: Kick-Starting Internet Ecosystems in Developing Countries

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The power of the Internet has redefined the global economy for the 21st Century. As of 2014, over three billion people around the world were connected. The corresponding boom in Internet-based retailers, news and information providers, and online entertainment and video companies has been just as impressive.¹ Businesses go where the customers are, and increasingly the customers are online or mobile.

Unfortunately, the online revolution is lagging in many of the least developed parts of the world. Consider that as of 2014, fewer than 30 percent of Africa's 1.1 billion population used the Internet.² At the same time, relatively few African businesses have participated in the Internet business boom. Less than one percent of all existing domain name registrations in 2013 originated from Africa, meaning African-based businesses have very little local or global presence on the internet.³

The problems are multiple. Building a broadband infrastructure to all homes, especially in rural areas, is too costly for many low-income countries. And mobile broadband service, while more broadly available, is also relatively expensive to provide and high-priced compared to incomes. As a result, broadband markets are limited in many poor and developing areas. In 2013, for example, there were 20 mobile broadband subscriptions per 100 people in the Philippines, and just three for every 100 people in Kenya.⁴

At the same time, a low level of connectedness keeps the local Internet ecosystems stunted. Entrepreneurs are unwilling to start new Internet-based businesses because there aren't enough customers online. Conversely, without local Internet-based businesses providing relevant information, content, and services, potential customers have less incentive to invest in expensive data plans for their smart phones.

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Consider the obstacles facing a potential local business that would collect agricultural prices across a poor country, and post them online. Such Internet businesses have increasing returns to scale—expensive to collect the information in the first place, but relatively cheap to provide it to more and more customers. That means such a business—which would be very beneficial to farmers—is far easier to start and far more profitable if the pool of potential customers is large. But if the pool of potential customers is small, the business may never get started, and there will be even less reason for poor mobile phone users to buy a data plan.

The online revolution is lagging in many of the least developed parts of the world.

In other words, developing countries can get stuck in a low-connectivity equilibrium, where there are relatively few broadband customers and few local Internet-based businesses to serve them. How, then, can we jumpstart the local internet ecosystem in developing countries to move from a low-connectivity equilibrium to a high connectivity equilibrium where the number of users with data plans is higher and the country has viable local Internet-based businesses that both generate jobs and provide relevant content and services to mobile users? As more people connect to the Internet, local content and service providers will create and expand existing content to meet demand. This will boost growth in the local economy, which in turn will generate greater demand for local content and enable more people to connect to the Internet. This is a transition that many developed countries made in the late 1990s and early 2000s. How can we accelerate it in poor and developing countries?

This paper explores one approach for jump-starting local Internet ecosystems where connectedness is low—a practice known as “zero-rating.” Under this program, mobile operators

provide its customers with access to certain online content, or package of websites, for “free,” in that such content does not count against monthly data caps. There are several variations of zero-rating programs, many of which do not involve any exchange of funds among firms. One type of zero-rating outside the scope of this analysis is where content providers directly reimburse operators for foregone data costs is called ‘sponsored data.’ This paper contemplates programs more like Internet.org or Wikipedia Zero where content providers do not directly compensate operators for lost data revenue.

It’s important to note here that this paper focuses mainly on the use of zero rating in poor and developing countries, and the arguments are laid out with those situations in mind. In future work, we will explore the ways that zero-rating is useful in developed countries, and especially among less-connected populations.

The power of zero-rating to nourish an Internet ecosystem in poor and developing countries comes from its potential to increase connectivity by both people and businesses quickly and at low-cost. First, free access to popular sites like Google, Twitter, Wikipedia, and Facebook encourages more people to sign up for data plans, and enables greater data freedom to explore local content. Second, the increase in demand for local content spurs local businesses and entrepreneurs to create new online products and services—for example, information on Ebola outbreaks, typhoon warnings, or even wait times at local stores and government offices. Moreover, the higher share of population online justifies efforts of government agencies to go digital, which in turn encourages more business and individuals to join the internet ecosystem. Taken together, zero-rating can effectively jump start a virtuous feedback loop that moves the local economy into a high-connectivity equilibrium.

Zero-rating has already been adopted by mobile operators in poor and developing countries, including the Philippines, Turkey, India, and across Sub-Saharan Africa. And although these programs are relatively new, early indications show

more people are connecting to the Internet in these countries.

However, zero-rating has some detractors. Some argue for banning the practice, claiming that it violates net neutrality principles by prioritizing select content. Others argue that free access to select content is too limited to provide the digital literacy skills needed to fully participate in the data-driven economy.

Still, this paper argues that given the promise of early indications, it seems bad policy to squash the potential of zero-rating, especially in countries trapped in a low-connectivity equilibrium. Instead, this paper proposes several ways to enhance the potential effectiveness of zero-rating as a tool for growth for poor and developing communities. That includes being non-exclusive across mobile operators and transparent. We also suggest regular evaluation and reporting of zero-rating programs, to better inform mobile operators and relevant policymakers of the actual risks and rewards.

By banning zero-rating, poor and developing countries would deprive themselves of a possible avenue for economic growth and prosperity. They are closing a pathway for their citizens and businesses to harness the power of the Internet, moving them to a high-connectivity equilibrium. In the language of economics, that would mean forgoing one of the greatest positive externalities of having a vibrant Internet ecosystem: economic and social mobility.

LOW CONNECTIVITY EQUILIBRIUM

In a low-connectivity equilibrium, people and businesses have little motivation to connect to the Internet. A lack of access to Internet-based consumers keeps businesses away from online expansion and sidelines aspiring tech entrepreneurs. On both the consumer and business side of the market, being connected comes at a high cost and low marginal return.

A low-connectivity equilibrium is prevalent in many poor and developing countries. People have little incentive to spend precious income on data plans, given the lack of valuable content. It's no

accident that, of the estimated 4.5 billion people worldwide still unconnected to the Internet, 90 percent—over 4 billion—are in the developing world.⁵

With low-connectedness, businesses are limited to their existing consumer base, and have little incentive to invest in creating online platforms for their products. Internet entrepreneurs have no motivation to transform their ideas into new start-ups, lacking the promise of growing profits or the ability to get seed money. The dearth of business formation and growth traps the local economy in an unconnected low-growth state, without access to global online markets.

Advanced countries have about 84 active mobile subscriptions per 100 people, compared to about 21 per 100 people in developing countries.

Similarly, government agencies have little incentive to go digital if there are too few citizens with the capability to connect online. Why should they spend precious resources setting up webpages and digital access to services if only a small portion of the population have access?

It is easy to see why some countries get stuck in low-connectivity equilibrium, even as the benefits of being connected are great. A major reason for this is cost. Even in areas where fixed or mobile broadband is accessible, the price for a mobile broadband subscription is simply too expensive for many. According to one recent estimate, people in developing countries with mobile phones pay between 8-12 percent of their average monthly income on mobile connectivity, and that is often just for voice and text.⁶

Consider that a mobile data plan in the Philippines costs on average the equivalent of \$17 a month,

which does not seem like much. Yet this constitutes almost 10 percent of the per capita monthly average national income, according to International Telecommunications Union. That ranks the country as 87th out of 110 countries on affordability for mobile broadband.⁷ It is not obvious to the millions who remain unconnected that it is worth spending a large share of their income on something that may not be essential. And without the online customer base, it is not obvious to businesses that they need to spend the time and money to develop an Internet presence. Thus we have a negative reinforcing cycle.

HIGH-CONNECTIVITY EQUILIBRIUM

Conversely, other countries in the global data ecosystem are highly connected. In a high-connectivity equilibrium, people and businesses are integrated online, constantly feeding off each other to create new content and services that enhance consumer well-being. The result is a strong foundation for economic growth and shared prosperity.

Many advanced countries are in a high-connectivity equilibrium. These countries have enjoyed rapid growth in the number of online businesses, mobile subscriptions, and tech-related job creation. According to a 2014 report, developed countries account for over 80 percent of domain name registrations, which all websites must have.⁸ They have about 84 active mobile subscriptions per 100 people, compared to about 21 per 100 people in developing countries.⁹ High-growth tech clusters are sprouting up across the United States, and in leading global cities like London and Sydney, creating millions of high-wage jobs.¹⁰

That's because in a high-connectivity equilibrium, businesses and entrepreneurs thrive in a vibrant digital marketplace. They are able to meet strong consumer demand for online content and services through an ever rising number of apps, online retailers, social media forums, and new products unique to the Internet.

Some of today's largest companies around the world would never have been as successful had it

not been for a highly connected population. Some companies, like Apple and Samsung, produce sophisticated smartphones and other Internet-able devices. Others, like Amazon, provide consumers with a one-stop retail experience. Search and software giants like Google and Microsoft empower consumers and businesses with essential tools and services. All of these companies feed off each other's growth in a high-connectivity equilibrium.

Indeed, the power of online commerce has translated into an enormous rise in data-related consumption and trade. PPI has previously written on both these topics, showing just how important the Internet has become to driving productivity and national incomes.¹¹ In fact, the profound pace of data-driven innovation has been so rapid, researchers are still developing ways to accurately measure the Internet's impact on government economic statistics.

Another important part of high-connectivity equilibrium is having strong investment in the build-out of high-speed broadband networks. Such robust investment is evident in many developed countries, including the United States, whose private telecommunications and cable sector invests billions annually in fiber installation and high-speed 4G/LTE mobile networks. Overall, annual capital expenditures of mobile operators in developed countries well outpaces the developing world.¹²

SHIFTING FROM A LOW TO HIGH-CONNECTIVITY EQUILIBRIUM

It is possible to move from a low- to high-connectivity equilibrium. After all, developed countries were able to make this transition in the late 1990s and early 2000s. These countries also continue to enjoy a sustained momentum in the large share of the population purchasing a monthly mobile data plan, as the bevy of available online content and functionality grows and becomes more relevant in everyday life. In the United States, for example, there are more wireless connections than people, with many connecting to the Internet through multiple devices.¹³

The shift from a low-connectivity to high-connectivity equilibrium in developed countries occurred more organically than in developing countries. That's because a relatively large share of the population in developed countries had enough income that they could afford to sign-up for the Internet. It took a lower initial benefit from going online—less available online content—to convince many citizens in the developed world to spend their income on a fixed broadband connection. This led to an easy transition to mobile broadband plans once they became available.

In high-connectivity Internet ecosystems, consumers and businesses feed off each other to create new content, generating income, jobs, and more demand.

Some researchers also credit the rise in Internet demand in developed countries to a few initial “killer apps.” These offerings were widely believed to have helped influence on early Internet adoption. For example, the proliferation of social media is credited with encouraging people to spend on an Internet connection. Starting with online chat rooms and CompuServe, and continuing on through America Online, MySpace, Facebook, Twitter, Reddit, and LinkedIn, social media has transformed how people communicate, get the news, and create their own content to share.¹⁴ It has connected traditionally harder to reach segments of the population, like those in rural areas and the elderly, who want a low-cost way to stay in contact with family and friends.

In these high-connectivity Internet ecosystems, consumers and businesses feed off each other to create new content, generating income, jobs, and more demand. Since the introduction of the iPhone, the number of available iOS apps increased from 800 in July 2008 to a staggering 1.3 million in September 2014.¹⁵ The number of



Android apps in the Google Play store is just as high, if not higher. The rising demand for online video has resulted in companies designing an interactive watching experience across devices, with consumers able to watch movies, listen to music, and even catch their favorite shows on their tablet, phone, or TV.

GETTING FROM LOW TO HIGH-CONNECTIVITY

How can developing countries shift to a high-connectivity equilibrium? There are several forms of intervention that can encourage the transition. Each approach has its advantages and disadvantages, but the effectiveness will ultimately depend on how well it is able to jumpstart the Internet ecosystem. That is, how successful it is at getting more people and businesses connected to the Internet, by lowering the cost of access while encouraging more local content.

One approach is for governments to intervene directly, by providing subsidies to either people or businesses. Both have extensive histories of being employed in developing countries, with mixed success.

In developing countries, government subsidies are often used to get people to act in certain ways.

A well-regarded example is the Bolsa Familia program in Brazil, which gives poor families money if they vaccinate their children and send them to school.¹⁶

Some governments in developing countries have provided free broadband access to encourage greater adoption and improve the local business climate for content creation. In Macedonia, for example, the “Rural Broadband in 680 Locations” project has provided free WiFi access in 680 rural locations across the country since 2009. A World Bank evaluation considered the program to be successful at enabling greater access to agricultural and education information, and public online services.¹⁷

Governments can also provide subsidies to businesses, often in the form of what are generically known as ‘universal service funds.’ These government-controlled funds provide money to the private sector to build out broadband networks in poor or remote areas where there is no compelling business case. However, while popular, this approach has had limited success. According to a 2013 survey of 69 such funds, half reported little to no activity. The funds were collected but have yet to be utilized.¹⁸

Although it’s still too soon to assess the impact of many zero-rating programs, early results are promising.

Another approach to shifting to a high-connectivity equilibrium is more indirect. It involves the government allowing the private sector to offer Internet content people value at low-cost. Here, the private sector is providing the subsidy to consumers to increase the number of people purchasing a data plan, which will increase the amount of online content being created.

One such indirect approach is known as a practice called “zero-rating.” Zero-rating is where mobile operators offer select online content for free, in

that accessing it will not count against any monthly data caps (hence, it is “zero-rated”). In some cases, the mobile operator may offer zero-rated content to people even without data plans.

The idea behind zero-rating is simple: to get more people connected by providing access to popular websites, and to provide greater freedom to use data for local content, increasing demand. That is, when certain content is zero-rated, particularly high-demand services like Google and Facebook, people are free to use a higher percentage of their existing data cap on other content. This will jumpstart the local Internet ecosystem. And since the success of zero-rating is sparked by low-cost access to popular online content, it follows that the main sites being offered to date include social media giants Facebook and Twitter, along with Google and Wikipedia.

Zero-rating is widely offered across many developing countries. In fact, a recent study found that 45 percent of global mobile operators offer some form of zero rating. This includes offerings in many of the countries with the lowest incomes and broadband adoption rates, stuck in a low-connectivity equilibrium, like Tanzania, Cameroon, Ivory Coast, India, Moldova, Uzbekistan, and Pakistan.¹⁹

Zero-rating can take several forms, depending on the mobile operator. It can be offered on a temporary basis, over a few months, or it can be permanent. The content being zero-rated is also at the discretion of the mobile operator, which ranges from one high-demand website to several sites that may include local content.²⁰ Zero-rating is generally not monetized, so that there is typically no payment between the mobile operator and content provider. But there is usually a legal agreement between content provider and operator, that delineates terms of use and could include provision of technical assistance for implementation.²¹

ADVANTAGES OF ZERO-RATING

In shifting to a high-connectivity equilibrium, a zero-rating approach has several advantages over direct government subsidies. For developing countries that may have scarce resources, these

advantages are important in considering ways to effectively jump-start local Internet ecosystems.

First, zero-rating can jumpstart an Internet ecosystem at a faster and significantly lower cost. Direct government subsidy programs can be very costly, and spread out over many years. They may also be harder to contain, especially programs that fund public broadband networks or subsidize Internet-capable devices. That's because mobile broadband technology is constantly evolving, as are the devices that run on the networks. It is very expensive to successfully build, operate, and maintain government-owned broadband networks, especially when increased public-take up of broadband is not guaranteed. Even in developed countries, government-owned broadband networks have a very mixed record of success.

Zero-rating is cheaper because mobile operators subsidize the costs to provide zero-rated data. They internalize the costs through their billing processing operations. Moreover, even if these operators are government-owned, there are typically no direct payments to the zero-rated content creator.

Second, with zero-rating, an Internet ecosystem can flourish relatively quickly, because such offerings can be more easily implemented and maintained, or adjusted according to public response. It is much easier, and cheaper, for example, to extend the zero-rated offering beyond a trial period than it is to increase the amount of a monthly public subsidy.

Third, zero-rating comes with significantly less government control. That not only reduces the burden on governments with limited resources, but it also limits the possibility of mismanagement. Without a large cash transfer program, there is much less room for misallocation or waste of funds, or worse, corruption.

For example, a 2013 opinion survey covering seven African countries found a dramatic impact from the availability of more information on the Internet. When asking people what had changed in communications over the last five years, it

found that the Internet and greater access to information online “are interconnected as wider media generally drives a wider set of viewpoints and information[,] with the Internet acting as a backstop where people can get information not provided by traditional media or actually restricted by Government.”²²

The rise in Internet users in Kenya is also helping drive the creation of more local online content.

Finally, although it's still too soon to assess the impact of many zero-rating programs, early results are promising. In several developing countries where mobile operators have already offered zero-rated content, Internet ecosystems are taking off. Mobile operators are reporting an impressive rise in mobile data plan subscriptions and mobile data consumption.

The Philippines, for example, a country whose mobile operators actively engage in zero-rating, has recently begun to enjoy a prosperous Internet start-up culture. A basic search online shows a large and wide variety of Filipino Internet companies, offering services like digital queuing,²³ selling products like folding bicycles, and helping citizens monitor their electricity use in real time. Tech incubators are springing up, and injecting Internet businesses with capital.²⁴

Further, the Philippines has seen rapid growth in the population connecting to the Internet, including a double-digit rise in the last year.²⁵ So successful was a temporary offering of zero-rated Facebook content (known as Facebook Zero) by one of its main mobile operators, that it was later reinstated. According to reports, the original three-month program offered by Globe Telecom, a major carrier, led to a doubling of the company's mobile data user base.²⁶ The Globe's latest annual report also shows the number of mobile subscribers increased by 16 percent year over year, 74 percent stronger growth than in the preceding year.²⁷

Of course, the tremendous growth in Internet startups and Internet users cannot be directly attributed to the country's various zero-rating programs, but they certainly contributed. The Globe's annual report, for example, touts the program as a core component of its services offering.

Perhaps some of the most promising examples of early zero-rating success in jumpstarting Internet ecosystems are in Africa. Many African countries have mobile operators that offered some form of zero-rating, starting as early as 2010.

Without any exposure to the Internet, there is no chance of moving from a low-connectivity to a high-connectivity equilibrium.

Within the first year offering zero-rated content, the evidence of increased Internet adoption across Africa—using new subscriptions to Facebook as a proxy—was remarkable. According to oAfrica, a data service that tracks Internet progress in Africa, the number of Facebook users across the entire African continent increased by an average 114 percent.²⁸ This includes a 4,000 percent increase in Central African Republic and a 2,000 percent increase in Chad and Somalia.

Certainly an increase of Facebook subscriptions does not mean more Africans are purchasing mobile broadband plans, or that more people creating Facebook accounts are initiating local Internet ecosystems. But it appears to be serving as an important catalyst on both fronts. According to one take on a 2009 Inveneo conference:

The consensus of group, marketing and technical experts at African ICT companies, was that Facebook was creating demand for their services. Current clients wanted faster Internet connectivity to download all the images and video sent their way via Facebook, and more technology (cameras, video &

image editing software) to create content for their Facebook pages. All the chatter about Facebook accounts was also driving new customers to buy computers and invest in Internet connectivity. "I need to get Facebook," is becoming a common refrain at retail computer stores.²⁹

Egypt, in particular, has seen an impressive rise in their Internet economy over the last few years. While there may or may not be a connection, Egypt's participation in zero-rating programs began several years ago, and its main mobile operator Orange began offering Facebook Zero in 2012. Preliminary reporting showed a massive rise in customers connecting to the Internet, with 350,000 new subscriptions in the first month.³⁰

Concurrently, Egypt's businesses have made a dramatic shift to go online. According to data compiled by the United Nations Conference on Trade and Development, over 2008-2012 the share of urban businesses using the Internet increased from 29 to 56 percent, while the share of rural businesses online increased from 9 percent to 38 percent.³¹ The rise in rurally-located businesses on the Internet, serving the more vulnerable populations in terms of Internet connectedness, is especially promising.

Undoubtedly, the rapid adoption of Internet-based business models by businesses in urban and rural parts of the country was influenced by the rising number of people connecting to the Internet. Over the last year alone, the number of Internet users in Egypt rose 10 percent.³² Taken together, this suggests the beginnings of a flourishing Internet ecosystem that could shift the country into a high-connectivity equilibrium.

Progress in Africa on creating Internet ecosystems in countries that have employed zero-rating is not limited to the northern part of the continent. In Kenya, for example, another country whose mobile operators offered Facebook Zero, the number of Internet users is steadily rising. In 2014, the number of Kenyans connecting to the Internet increased by a whopping 16 percent.³³

The rise in Internet users in Kenya is also helping drive the creation of more local online content. According to an excerpt from the 2014 Ericsson Mobility Report:

New business opportunities that have been created by the Internet have been boosted by consumers' increased access via mobile phones. This has led to the development of new business models. In Kenya, Mozambique, and Nigeria, TV and media services are increasingly being accessed using smartphones...influencing the development of local and regional content. Innovations such as this give rise to further market trends such as multiscreen consumer behavior. The rise in sophistication of social networking platforms has played a role in the growth of mobile traffic.”³⁴

These early indications of successful development of Internet ecosystems in countries with a low-connectivity equilibrium point to a promising role for zero-rating programs. As more data continues to be collected and reported, it is possible we will see further success on the development of these and other Internet ecosystems in countries where zero-rating is available.

CRITICISMS OF ZERO-RATING

There are critics who oppose using zero-rating as an approach to shifting to a high-connectivity equilibrium. These critics argue it will do little to benefit the local population or economy, and that it could even harm competition in local markets.

First, critics of zero-rating see it as a form of content prioritization.³⁵ Some opponents, such as Susan Crawford, claim it discriminates against the creation of local would-be content providers of similar services.³⁶ In this scenario the Internet ecosystem is not stimulated, because businesses are unable to compete with the few sites that receive preferential treatment. This view posits a zero-rating spiral, where any business that wishes to succeed will have to negotiate their own zero-rated deals with operators. This would keep local content developers out of the market, or at the very least discourage creation of non-zero-rated content.

Fear of discriminatory practices is why countries like Chile have already banned zero-rating.³⁷ Other developing countries that are considering similar measures are doing so on the grounds that any prioritization is a violation of net neutrality.

Core principles encourage public and government trust in mobile operators' intentions when pursuing zero-rating programs.

Second, opponents of zero-rating argue that the shift to a high-connectivity equilibrium may not happen if consumers are unable or unwilling to go beyond the free content. Here, zero-rating forms a “walled garden” around the Internet, also referred to as a separate “Internet for poor people.”³⁸

The underlying presumption is that if people can't afford a data plan regardless of zero-rated content, even if they see the relevancy of having Internet access, then zero-rating is irrelevant. The ecosystem will never get off the ground, leaving people with a fragmented slice of the Internet. In this scenario, instead of bridging the digital divide, zero-rating will widen it, ultimately doing more harm than good.

These zero-rating opponents also point to evidence in some developing countries that people already believe sites like Facebook constitute “The Internet.” According to one Quartz article, “Facebook is literally becoming the Internet.” It cites the overwhelming share of Filipino citizens on Facebook as a share of those using the Internet, and details how a leading handset manufacturer even includes Facebook's logo in its advertising.³⁹

Interestingly, however, the same article also explains why these claims of “Facebook being the Internet” are exaggerated. Facebook has penetrated just 6.5 percent of the population in Asia, and less

than 5 percent in Africa.⁴⁰ Moreover, it is not clear why increased use of social media—and any other zero-rated content—is negative. That could actually be a sign of the zero-rating’s success in these countries at getting more people and businesses online.

Ultimately, exposure to ‘some Internet’ is far more likely to be a gateway to increased data consumption than to block Internet usage or reduce it. Without any exposure to the Internet, there is no chance of moving from a low-connectivity to a high-connectivity equilibrium. That makes it all but assured people will not be able to learn the digital skills they need to participate in the digital revolution.

Zero-rating also cannot work without basic broadband infrastructure in place, particularly for mobile broadband.

Moreover, people and businesses in poor and developing countries stand to gain the most from becoming connected. They are in some ways even more reliant on being connected than people in developed nations, and stand to lose out on more social and economic opportunities without it.

The popularity of social media sites like Facebook and Twitter is not the problem with zero-rating—it is an opportunity. According to a recent Pew survey, “Once people have access to the internet, they tend to engage in social networking.”⁴¹

Not counting popular social media content against data caps will give people the freedom and incentive to explore local content and services. And instead of competing with the social media giants for customers, local enterprises can work with them as part of the larger Internet ecosystem. They can take advantage of the ability for people to use any zero-rated social media platforms, as an opportunity to reach potential customers. They can create their own social media pages for customers to follow, and

even advertise their latest goods and services, at a relatively low-cost.

ENHANCING ZERO-RATING THROUGH POLICY

Rather than ban zero-rating, countries should follow certain core principles that will enhance its ability to successfully ignite a local Internet economy. That is, a set of characteristics for zero-rating programs to incorporate, as highlighted by the successes demonstrated in the preliminary evidence.

These principles will still enable the many shapes and sizes of zero-rating programs currently in practice. A one-size-fits-all approach to zero-rating simply does not make sense given the large variance in underlying social and economic demographics of the target low-connected populations.⁴²

Rather, these principles should incorporate lessons from current practice, to establish a base set of features that should be common to all zero-rating programs. We believe this will give future programs the best chance of becoming a successful ecosystem jumpstart, while addressing some of qualms voiced by zero-rating critics. Such principles encourage public and government trust in mobile operators’ intentions when pursuing zero-rating programs.

For example, we propose the following core principles for zero-rating programs:

1. **Transparency**—all zero-rating offerings should ban secret agreements between content provider and mobile operator.
2. **Non-exclusivity**—there should be no agreement that prohibits multiple operators from offering the same zero-rated content. This will mitigate fears of anti-competitive behavior.
3. **Local content**—when possible, mobile operators should also zero-rate some basic local content, such as local government services or local healthcare and weather alerts.
4. **Evaluation**—regular data collection and reporting from the mobile operators will help governments understand the effectiveness of zero-rating.

Finally, governments in developing countries must also continue and build on efforts to ensure adequate digital literacy skills across their population.⁴⁴ Such training must start early, in schools and at home. This includes efforts to better prepare teachers, and it includes making sure schools have access to the Internet.

A FUTURE OF HIGH-CONNECTIVITY

A country trapped in a low-connectivity equilibrium faces serious challenges in terms of future growth and prosperity. As the data-driven economy continues to govern global growth and high-wage job creation, these countries risk being completely left out of the Internet's tremendous social and economic opportunities.

Fortunately, it is possible for countries trapped in a low-connectivity equilibrium to make the transition to high-connectivity. However, some approaches

may work better than others, and one in particular may come with a cheaper price tag and more public trust: zero-rating.

In particular, this paper explains why zero-rating may be the most viable and low-cost approach in moving to a high-connectivity equilibrium. It has the power to boost local content and local demand for online goods and services, and early indications of its effectiveness are promising.

That's why, at the stage, it would be a mistake developing countries to dismiss the potential of zero-rating. Instead, there are ways governments debating the merits of zero-rating could think about core principles to make the practice more effective. Until these countries in low-connectivity equilibriums successfully make the transition to high-connectivity, it would be wise to keep all economy-boosting options on the table.

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