Making internet-enabled phones more affordable in low- and middle-income countries

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Author
Anne Delaporte

Contributors
Isabelle Carboni, Nadia Jeffrie, Dominica Lindsey, Claire Sibthorpe and Melle Tiel Groenestege.

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Contents

Executive summary

Around the world, 3.4 billion people are not using mobile internet despite living in areas with mobile broadband coverage.[1] Most live in low- and middle-income countries (LMICs) and are disproportionately women, rural residents and in lower income groups.[2]

The affordability of internet-enabled handsets is a key barrier to using mobile internet and is of growing concern. The COVID-19 pandemic and resulting economic fallout caused disposable household income to drop, making handsets less affordable for many. For those with limited income to save or limited access to credit, access to affordable handsets and to affordable finance will be a necessary condition to digital inclusion. In addition to reducing the absolute cost of an internet-enabled handset and support an individual's ability to pay, providers also need to ensure that devices meet men's and women's life needs and support their "willingness to pay" (see Figure 1).

This report provides an overview of approaches and business models that are improving the affordability of handsets for various underserved populations in LMICs.[3] It explores some of the nuances among these groups, considerations for meeting their different needs and variations between markets in Sub-Saharan Africa and South Asia. It also provides practical recommendations for stakeholders to make internet-enabled devices more affordable and an analysis of how the policy environment can contribute.

We identified two key levers to deliver more affordable handsets: reducing the price of the handset through efficiency gains and cost savings in the value chain and improving customer access to financing. Both need to be supported by an enabling policy environment. This report highlights the roles that stakeholders throughout the handset value chain can play in addressing the affordability barrier.

1 GSMA. (2021). The State of Mobile Internet Connectivity 2021.

2 *Ibid.*

3 This report builds on our 2017 report that explored various business models to accelerate smartphone ownership in LMICs. For more information, see: GSMA and Dalberg Global Development Advisors. (2017). Accelerating Affordable Smartphone Ownership in Emerging Markets.

In this report, we highlight the significant progress that has been made in reducing the cost of handsets, as well as partnerships throughout the value chain and the shift from savings products to handset financing plans that are better suited to underbanked populations. However, the extent to which these approaches will scale to reach the 3.4 billion people still not using mobile internet remains to be seen. While the performance of entry-level internet-enabled handsets is likely to improve, costs are not expected to decrease significantly in the coming years. Progress in handset affordability is more likely to come from even greater collaboration between industry stakeholders and a supportive enabling environment.

Key highlights

The affordability barrier is not just about the economic cost of purchasing a handset relative to income.

It is just as important to consider the cost of a handset in relation to a person's needs, preferences, and perceived value to their life. Non-income-related constraints also have an influence, such as awareness of mobile internet, digital skills, mobile-related safety and security and the social norms that constrain certain groups from accessing and using mobile and mobile internet, recognising that some of these constraints disproportionately impact on certain groups of the population, including women.

New technologies have emerged, disrupting the market and offering new opportunities to make handsets more affordable.

Over the past few years, two main innovations have driven down the cost of handsets: the development of lightweight operating systems (OS) and remote handset locking technologies. Lightweight OS have enabled the development of handsets that are less costly to manufacture, particularly smart feature phones and ultra-low-cost smartphones. This has narrowed the price differential between a basic 2G phone and a 3G or 4G handset. Similarly, the emergence of remote handset locking technologies has enabled a wider range of providers to offer financing with no or limited credit scoring by using the handset as collateral.

Lower prices can be offered by providing customised smartphones that meet local needs.

Several mobile operators, manufacturers and PAYG solar companies have been designing smartphones that are customised to the needs of end users in a specific market or region while simultaneously optimising the costs of smartphone components.

Procurement, distribution and marketing should not be overlooked when lowering handset costs.

It is possible to reduce handset costs by passing on the savings from more efficient procurement, distribution and marketing. The convergence of commercial interests to increase the availability and affordability of internet-enabled handsets has created new opportunities for partnerships, for instance, between the mobile industry and organisations that have developed last-mile distribution networks. Marketing partnerships can not only help reduce costs, but also reach a wider audience and raise awareness of the availability of affordable handsets and finance schemes.

The emergence of refurbished phone business models not only opens access to quality phones at a reduced price, but also helps the planet.

Keeping handsets in use for longer or giving them a "second life" can improve affordability. Those selling their handset receive money in exchange, thereby increasing their buying power. Those purchasing a refurbished handset can benefit from 10 per cent to 80 per cent discounts compared to buying one new.

Innovative finance schemes and payment models better suited to the livelihoods of people in LMICs are being developed.

There are context-specific factors to consider when developing an appropriate inclusive handset finance business model. Finance schemes that use alternative data for credit assessments or accept a handset as collateral allow customers to repay the handset in instalments, thereby reducing the upfront cost. Offering flexible payment terms, such as daily micro-repayments, are particularly well-suited to those who earn income on a daily basis.

Strengthening the enabling environment is key to improve handset affordability.

This report provides eight key policy considerations to improve access to internet-enabled handsets ownership for underserved populations. This includes reducing sector-specific taxes, providing subsidies to target user groups, developing public-private partnerships to de-risk handset financing, and stimulating demand by increasing awareness and willingness to pay.

There is no one-size-fits-all solution. Implementers should be mindful of the context in which they are operating and who they are aiming to reach.

Depending on the region or country, some solutions may be easier to implement than others. For example, a thriving mobile money ecosystem makes it easier to offer handset finance and good infrastructure is necessary for the collection of used phones in a refurbishment business model. Meanwhile, regulations such as high taxes on imported handsets and laws forbidding device locking inhibit innovation.

Definitions

Internet-enabled handset: For the purpose of this research, we define internet-enabled handsets as smartphones or smart feature phones that support at least 3G and are able to download apps from a universal online app store such as KaiOS, Google Play, etc.

Smart feature phone: A feature phone that has an operating system that supports a range of applications created by third-party developers and that are formatted to work on a smaller screen and accessed via a 9 key layout not a touch screen.

Smartphone: A mobile handset enabling advanced access to internet-based services and other digital functions. Smartphone platforms, such as Android, iOS, Windows Phone and BlackBerry, support a broad range of applications created by third-party developers.

1

Introduction

Owning an internet-enabled handset can be life changing.[4] Yet, for many living in low- and middle-income countries (LMICs), they are still unaffordable. For the 3.4 billion people who live in areas with mobile broadband coverage but are not using mobile internet,[5] affordability is a key barrier. According to the 2021 GSMA Consumer Survey, the affordability of handsets remains the top-reported barrier to mobile ownership in LMICs and a key barrier to mobile internet adoption, particularly for women and rural populations.[6] Ensuring that handsets are affordable for different underserved segments of the population is critical to enable access to mobile broadband and close the digital inclusion gap.

Mobile internet connectivity has a strong macro-economic impact; an increase of 10 per cent in mobile internet penetration results in an increase in 1.8 per cent of GDP in middle income countries and 2 per cent in low-income countries.[7] However, without a compatible device to access mobile internet, millions of people cannot reap the potential benefits mobile internet has to offer.[8]

Most of the unconnected[9] live in LMICs and certain groups are more excluded than others, including women and those living in rural areas.[10] Although smartphone adoption continues to increase across LMICs, penetration varies significantly by country and region. For example, in Sub-Saharan Africa, smartphones account for less than half of total connections while in South Asia they account for just over 60 per cent.[11]

4 GSMA. (2022). Mobile Internet Use, Well-being and Gender: Understanding the Links. Findings from Bangladesh and Ghana.
5 GSMA. (2021). The State of Mobile Internet Connectivity 2021.
6 GSMA. (2021). The Mobile Gender Gap Report 2021; GSMA. (2021). The State of Mobile Internet Connectivity 2021.
7 Research by the International Telecommunication Union (ITU) conducted between 2010 and 2017 in 139 countries. See: ITU. (2019). Economic contribution of broadband, digitization and ICT regulation: Econometric modelling for Africa.
8 GSMA. (2020). Legacy Mobile Network Rationalisation: Experiences of 2G and 3G migrations in Asia-Pacific.
9 The "unconnected" refers to people who do not use mobile internet.
10 GSMA. (2021). The State of Mobile Internet Connectivity 2021.
11 Note: the smart feature phone category of handsets is included in this data.

In most LMICs, the price of entry-level internet-enabled handsets had been declining over the past four years. However, in 2020, they simultaneously became less affordable in many countries as the result of the economic impact of the COVID-19 pandemic.[12] With income dropping, the economic impact of the pandemic has pushed more than 100 million people into extreme poverty.[13] While it is uncertain whether this trend will continue, the affordability of handsets will continue to be a barrier to mobile ownership, particularly for the lower income quintiles.

Definition: Internet-enabled handsets

For this research, we defined internet-enabled handsets as smartphones or smart feature phones that support at least 3G and can download apps from a universal online app store, such as KaiOS, Google Play or others.

In 2017, the GSMA published a report that explored various business models to accelerate affordable smartphone ownership in LMICs.[14] The landscape has changed since then as a range of exciting initiatives have sprung up to make internet-enabled devices more affordable.

This report builds on our 2017 report and provides an overview of approaches and business models that have made internet-enabled handsets more affordable and accessible to underserved populations. It explores some of the nuances between customer segments, identifies considerations for the industry to meet their diverse needs and highlights some of the differences between markets in Sub-Saharan Africa and South Asia. It also provides practical recommendations to make internet-enabled devices more affordable, including how policy and government can contribute (see Methodology in Box 1).

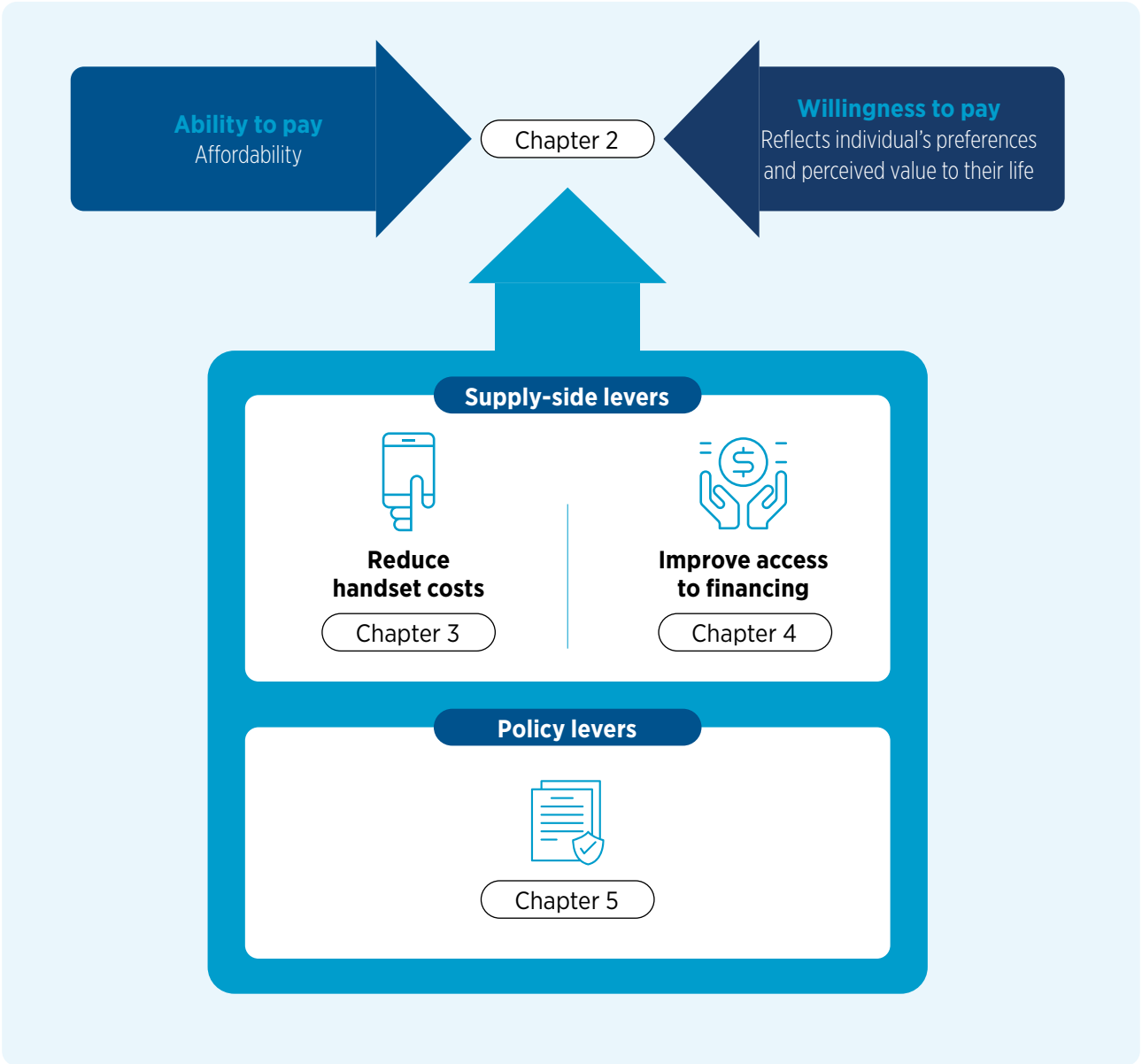
This report is not intended to be comprehensive. We have not included every business model, we do not set a threshold for what constitutes an affordable handset (see Chapter 2: Understanding handset affordability) nor do we explore the pricing strategies related to the featured business models. Rather, we have focused on dominant approaches to make internet enabled handsets more affordable and explored emerging business models with potential to scale, recognising that willingness to pay (WTP) should be considered alongside ability to pay when designing strategies to improve handset affordability (see Figure 1).

12 GSMA. (2021). The State of Mobile Internet Connectivity 2021.
13 United Nations. (2021). The Sustainable Development Goals Report 2021.
14 GSMA and Dalberg Global Development Advisors. (2017). Accelerating Affordable Smartphone Ownership in Emerging Markets.

WTP is the maximum amount a customer is willing to pay for a handset, and is influenced by a range of factors other than income, such as the perceived quality of the device, the value of being connected and the availability of various features. Typically, an individual who has already tried the internet on a friend's or relative's phone is likely to be willing to pay more for an internet-enabled handset than someone who has never experienced the benefits of being connected and who is likely to prioritise other purchases over an internet-enabled handset (preferring to purchase a 2G phone or other products rather than a 3G or 4G phone). Strategies that focus only on driving prices down may not be enough to attract first-time internet-enabled handset owners. It is important to also address other factors, such as issues related to awareness, relevance, skills, access and safety, all of which can have an impact on WTP.

Figure 1

A framework for handset affordability



Finally, increasing the availability of affordable handsets will not close the gap in mobile internet usage on its own. Unaffordable handsets must be tackled alongside other barriers for underserved populations, including low awareness of mobile internet, literacy and digital skills, a lack of relevant content and services, safety and security concerns and issues related to access. Strategies also need to consider prevailing social norms and underlying inequalities, including disparities in education and income, that limit access to mobiles and mobile internet for some segments of the population.

Box 1

Research methodology

The research was conducted in three phases in 2021, using a value-chain approach as a framework to examine the affordability barrier.

Desk research and interviews with GSMA experts

1

To identify new approaches and trends in LMICs to drive affordability of internet-enabled handsets and define priority areas for stage 2*

Industry expert interviews

2

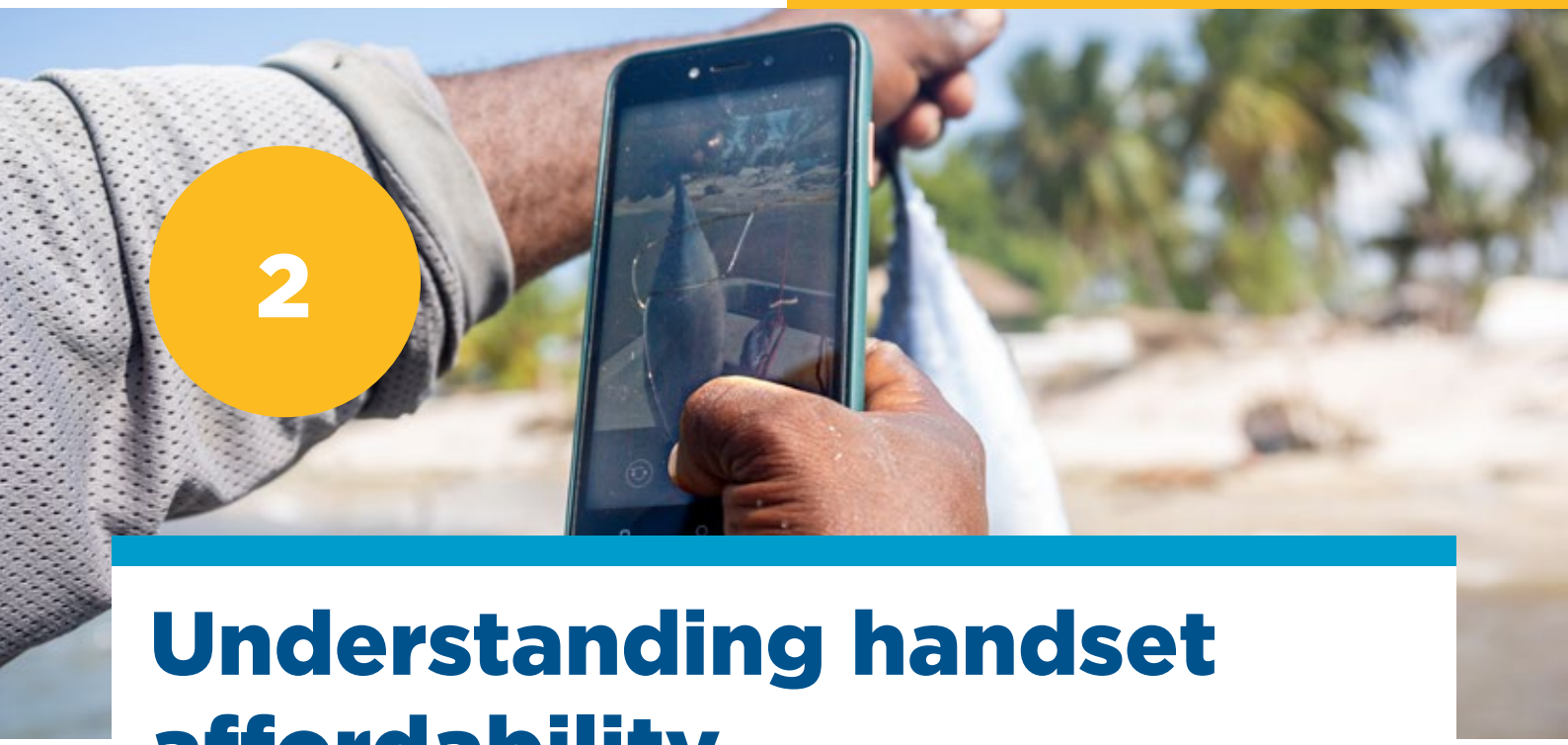
To gain a better understanding of the initiatives driving affordability of internet-enabled handsets identified in stage 1 including drivers of success, challenges, impact, enabling environment and scalability

Deep-dive on selected initiatives

3

To gather more detailed insights on promising examples of each of the main approaches to improving handset affordability covered in the report

* Note: In stage 1, no significant new approaches and trends were identified in Latin America. Therefore, stage 2 and 3 focused on Sub-Saharan Africa and Asia-Pacific.



2

Understanding handset affordability

Handset affordability, in the simplest terms, is the ratio between the price of a handset and a person's income. It is measured as the ability of an end user to pay for a handset.

A handset is deemed unaffordable if the price represents an excessive share of a person's income. While there is no commonly agreed threshold for the price of an internet-enabled handset as a proportion of monthly income, the cost of a handset is likely to be a significant barrier for those with limited purchasing power, particularly those with low or irregular incomes. For example, for an individual living on $5.50 a day or less, a $100 handset would account for 60 per cent of their monthly income or more. Affordability is a particularly high barrier for certain segments of the population, including women and people living in rural areas (see Figure 2).

Figure 2

Why affordability is one of the main barriers to digital inclusion for women and people living in rural areas

Women

- Women in LMICs tend to have lower income levels than men, be less financially independent[15] and have lower levels of financial inclusion,[16] all of which limit their options to save money, access credit and afford handsets.

People living in rural areas

- People living in rural areas tend to have lower incomes that are more prone to fluctuations and seasonal variations than their urban counterparts.[17]
- The price of a handset in rural areas tends to be higher than in large cities, due to high transportation and logistics costs, as well as the commissions taken by intermediaries (e.g. 15 to 20 per cent more for similar models in Bangladesh[18]).

15 Ortiz-Ospina, E. and Roser, M. (2019). "Economic inequality by gender".
16 International Monetary Fund. (2017). Women, Work, and Economic Growth : Leveling the Playing Field.
17 Castañeda, A., et al. (2016). "Who Are the Poor in the Developing World?" Policy Research Working Paper 7844. World Bank Group.
18 Key stakeholder interview.

Affordability is one factor influencing consumer purchase intention.[19] The definition of affordability as seen above does not consider consumer tastes, needs or aspirations, nor does it consider non-income constraints, such as digital skills, safety and security, and the social norms that often limit women's access to and usage of mobile and mobile internet.[20] Women and people living in rural areas tend to have lower digital literacy than men and people living in urban areas. Women also tend to be less confident in using mobile phones. They may fear they will break an expensive device or make a costly mistake, which hampers their willingness to use mobile handsets and mobile internet.[21]

Individuals have different perceptions of what is affordable, and needs, preferences and constraints vary among underserved groups and in different contexts. As such, there is no one-size-fits-all solution to handset affordability, and it is important to think about the cost of a handset not only as a share of income, but also in relation to a person's needs.

A consumer may be willing to allocate a relatively higher share of their income to an internet-enabled handset (and consider it affordable) if they perceive being connected as relevant, valuable and satisfying their personal needs or aspirations.

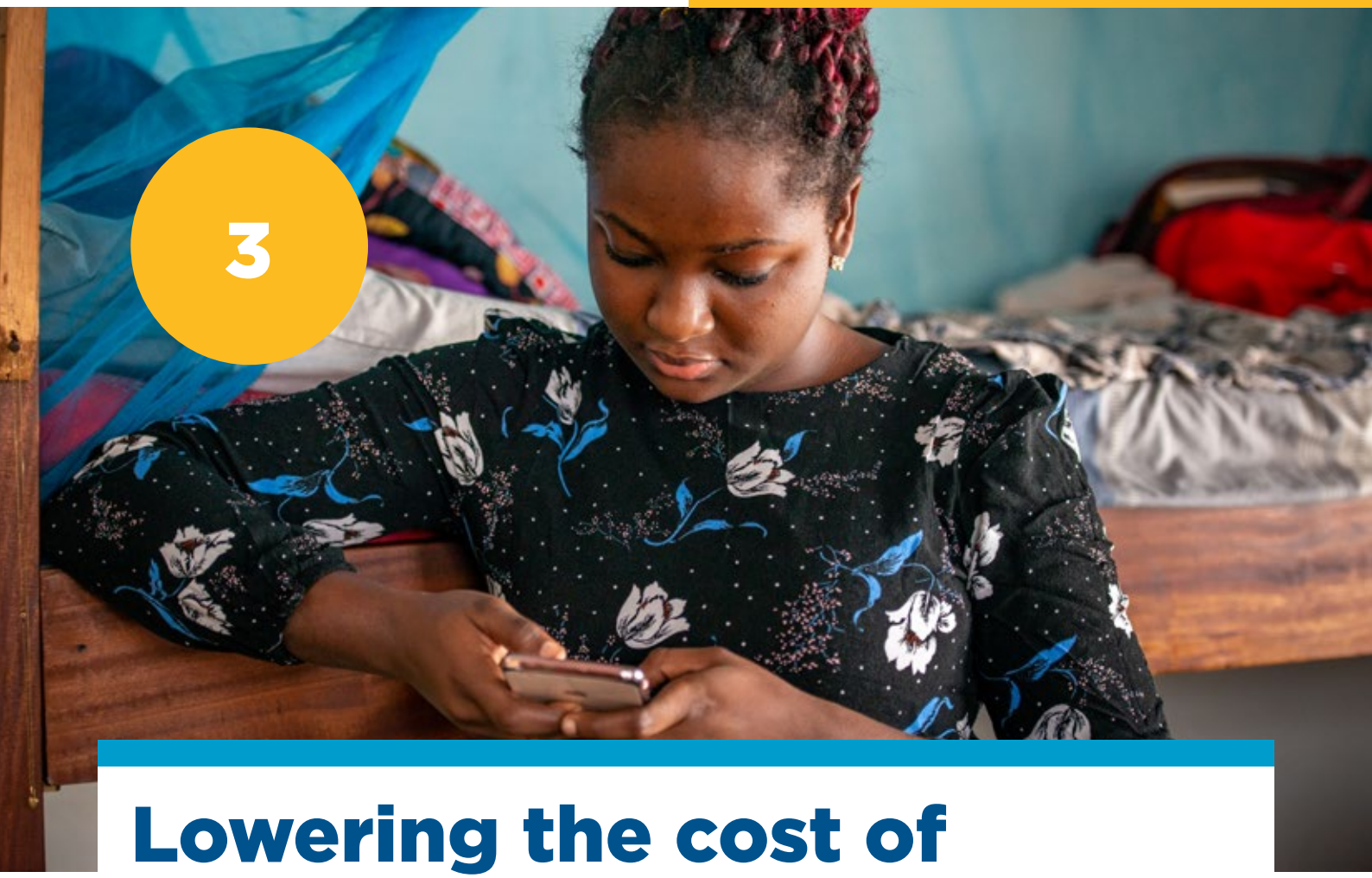
Approaches to tackle the handset affordability challenge will vary depending on whether end users are unbanked or underbanked, struggle to earn enough money at certain times of year or have enough money to pay for a handset in a lump sum or in instalments. For each of these profiles, different strategies exist to effectively offer internet-enabled handsets that consumers can purchase. Any approach should consider what a consumer segment wants and can afford at a given time based on their personal or household income (for those who are not financially independent). For example, while smart feature phones have been key to addressing affordability concerns in some markets for certain segments of the population (see Chapter 3), in other markets and demographic groups, the perceived status of a handset is more important, making smart feature phones less attractive than smartphones.

> "There is no real uptake of smart feature phones in Nigeria. Everyone wants to be socially relevant and socially connected while having a good experience on the internet. Customers focus way more on smartphones, which are an external sign of wealth."
>
> **Kelechi Nwankwo, Head of Academia Research Support, Nigerian Communications Commission**

There are two primary ways to make handsets more affordable: 1) reducing the price of the handset through efficiencies and cost savings in the value chain; and 2) improving customers' access to financing. These two approaches are explored in depth in this report (Chapters 3 and 4, respectively). Where appropriate, these approaches could be complemented with government interventions, and more details on enabling policy environments are covered in Chapter 5.

Any approach to making handsets more affordable needs to include an awareness-raising component. Consumers often have an exaggerated view of handset costs that leads them to believe that owning a handset is not an option. Common misconceptions of entry-level smartphones – that they are low quality, break easily and do not confer the desired social status – lead consumers to aspire to less affordable higher-end models. Consumers need to know there are cheaper handsets that can meet their needs and that financing solutions are available.

19 Other factors include, for instance, the quality of the device, the perceived value of being connected and the availability of various features.
20 GSMA. (2017). Triggering mobile internet use among men and women in South Asia.
21 GSMA. (2021). The Mobile Gender Gap Report 2021.



3

Lowering the cost of handsets for end users

One of the main ways to make internet-enabled handsets more affordable for underserved customers is to reduce the sale price. This can be achieved by identifying cost savings in the supply chain. In this section, we look at four approaches that offer the most promise to lower the absolute cost of handsets for underserved groups through more efficient supply chains:

1. Reducing the price differential between basic 2G phones and higher-end internet-enabled handsets by developing intermediate handsets that offer customers their first mobile internet experience at a slightly higher price (e.g. smart feature phones or ultra-low-end smartphones).
2. Customising smartphones to meet local needs at lower prices by optimising component costs.
3. Reducing procurement, distribution and marketing costs.
4. Applying circular economy principles to resell pre-owned handsets at a discount.

Box 2

What goes into the price of an internet-enabled handset?

A range of factors affect the price of an internet-enabled handset and understanding them is important to locate efficiencies.

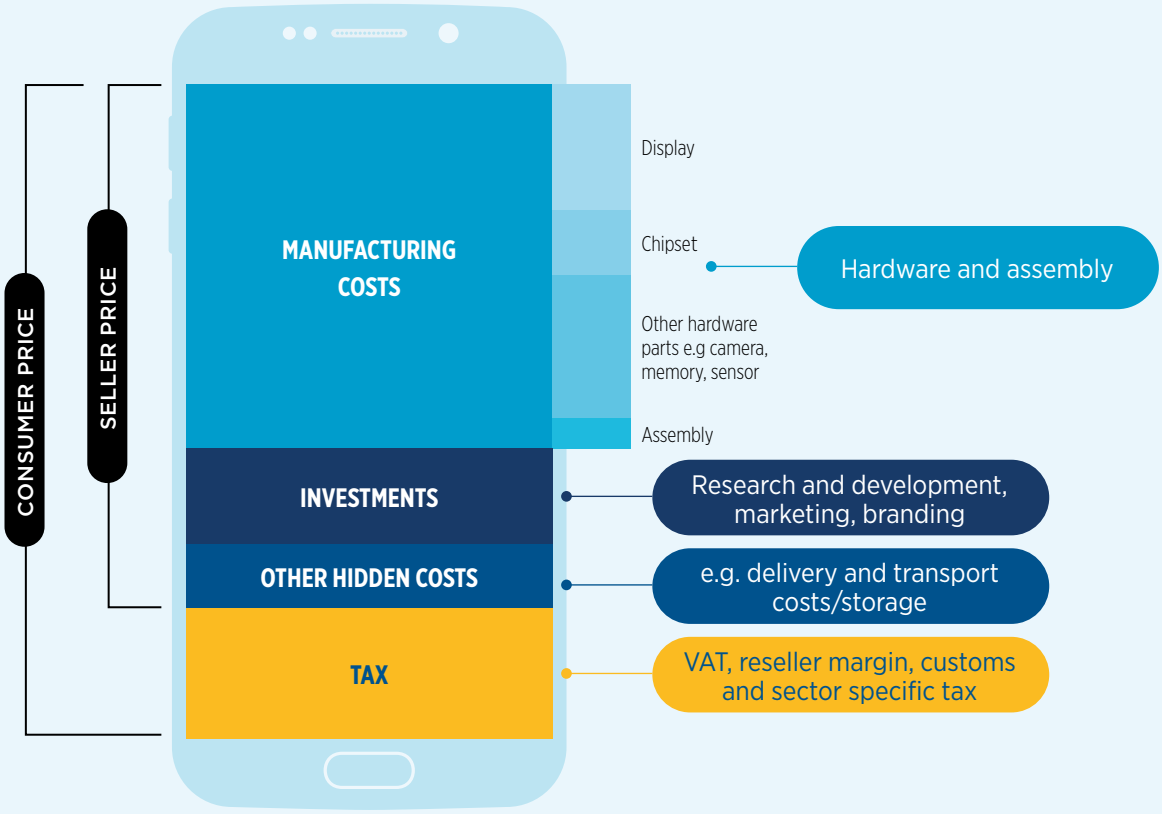
Depending on the handset, the proportion of the total retail price spent on manufacturing can vary from 35 percent[22] to 75 per cent.[23] The vast majority of these costs are for hardware and materials, with the display often accounting for a large proportion.

Post-production costs account for a significant proportion of the retail price. These include, but are not limited to, VAT, customs taxes, sector-specific taxes and reseller margins.

Other hidden costs, from research and development to distribution, also drive up retail prices for consumers (see Figure 3).

Figure 3

Price components of a smartphone*



*Proportions in the figure are rough estimates of what makes up cost of an internet-enabled handset. These proportions will vary between handsets and markets.

22 Alliance for Affordable Internet. (2020). From Luxury to Lifeline: Reducing the Cost of Mobile Devices to Reach Universal Internet Access. Web Foundation.
23 CounterPoint Research.

Reducing the price differential between basic 2G phones and higher-end internet-enabled handsets

To provide an entry point for low-income customers to experience the benefits of mobile internet, some mobile providers have developed intermediate handsets to bridge the price gap between 2G devices and higher-end internet-enabled devices. These handsets can be smart feature phones (~$20) or budget (ultra-low-end) smartphones (which can retail as low as $30) that offer customers their first mobile internet experience at a slightly higher price (about twice the cost of a 2G phone).

These devices have been made possible by lightweight operating systems (OS), a major innovation that has emerged in the past few years. Lightweight OS, such as KaiOS and Android Go, provide core smartphone functionality but require less expensive parts (less memory, less battery, lower-end chipset, etc.), lowering the cost of components needed to manufacture the handset. In addition to lower handset prices, lightweight OS also consume less data, making mobile internet usage more affordable for end users.

By bridging the price gap between basic/feature phones and mid- and high-end smartphones, intermediate handsets provide a more affordable way for first-time internet users to reap the benefits of connectivity. They can also be a stepping stone – if users see the value of being connected and want to invest more in an internet-enabled handset, they can upgrade to a higher-end smartphone (see Figure 4).

Figure 4

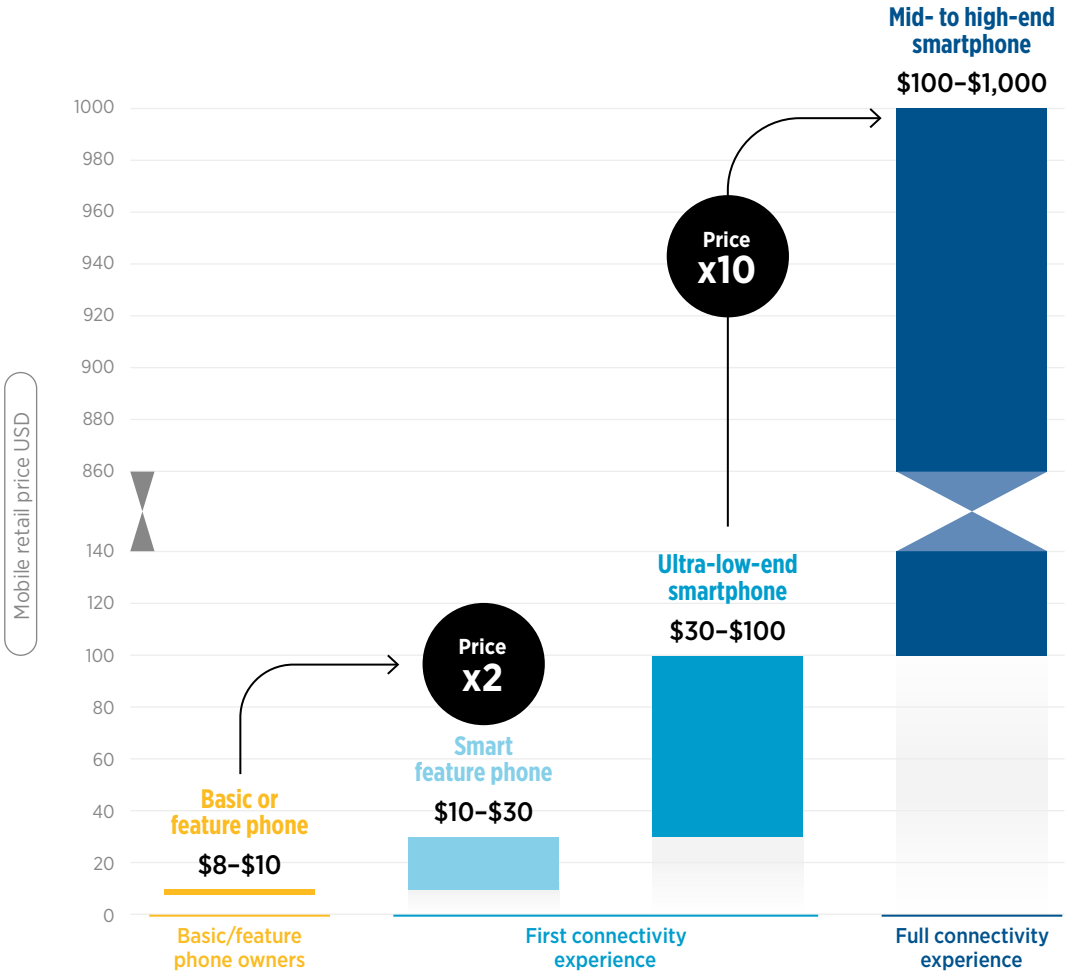
The pathway to mobile internet connectivity

Number of adults who do not own an internet-enabled handset

Sub-Saharan Africa	348m
Asia-Pacific (LMICs only)	1,165m

Number of adults to upgrade to mid- to high-end smartphone*

Sub-Saharan Africa	158m
Asia-Pacific (LMICs only)	293m



*Adults to upgrade: adults who own a smart feature phone or an ultra-low-end smartphone and could upgrade to a mid- to high-end smartphone. Calculations based on Altai Consulting analysis based on World Bank population data (2019); GSMA Mobile Economy SSA & Asia-Pacific 2020; IDC data for SSA (2019); GfK data for Asia-Pacific (2020); key stakeholder interviews.

The smart feature phone business model

The cheapest 3G/4G handsets available on the market are smart feature phones, powered by KaiOS. The smart feature phone business model is focused on functionality and appealing to segments of the population who are unable or unwilling to spend more than ~$20 for a device. Smart feature phones have the advantage of keeping the feature phone "form factor" (the same design as a feature phone but with a button keypad), which allows first-time internet users to access the internet on a device they are more familiar with, without having to learn how to use a touchscreen. As of March 2021, 165 million smart feature phones have been sold globally. Successful roll outs include the Jazz Digit 4G in Pakistan, Orange Senza, MTN Smart T, Techno T091 and Vodacom Smart Kitochi across Africa; and the Nokia retro series: 8110, 2720 Flip that are available globally.

In India, KaiOS formed a partnership with Reliance Jio to create JioPhone, an affordable 4G-enabled device. Branded by Jio as "India ka Smartphone" (India's Smartphone), the device has reached more than 100 million customers. JioPhone strikes a crucial balance between delivering content (e.g. live TV channels from all leading Indian broadcasters) and features (e.g. it can be set up in one of 22 vernacular languages available)[24] that appeal to first-time internet users through a device design which is familiar to the target audience, yet maintaining an aspirational factor.

Several mobile network operators (MNOs) have launched upgraded versions of their smart feature phones with a touchscreen for current smart feature phone customers. These ultra-low-cost smartphones are available in several markets (e.g. Orange Sanza Touch, JioPhone Next) and provide a way for customers to move gradually towards smartphone ownership.

> "Only a few new customers are buying [the Sanza Touch] as their first internet-enabled handset. Most of them already had the smart feature phone experience and now want a bigger screen, better battery and more memory."
>
> **Bertrand Gouze, VP Customer Equipment & Partnerships, Orange**

24 For more details, see: GSMA. (2020). Reaching 50 Million Women with Mobile: A Practical Guide.

Although the profitability of smart feature phone models can be difficult to assess and is commercially confidential, the number of launches in different markets indicate that the model can be financially sustainable for MNOs. This is most likely due to the increased average revenue per user (ARPU) generated from customers that have switched from a basic or feature phone to a smart feature phone. ARPU is typically multiplied two or three times when users upgrade from 2G to a 3G or 4G smart feature phone (depending on the market).[25]

For handset manufacturers, the benefits are less tangible since profit margins from smart feature phones are relatively low (on par with feature phones but lower than smartphones). High volumes of device sales are therefore needed to compensate for low margins.

Beyond the obvious benefit of smart feature phones providing a less expensive way to access the internet, other attributes make them particularly attractive to underserved groups, such as women and those living in rural areas:

- **Long battery life:** Typically lasts five days compared to one day for a smartphone. This appeals to individuals with limited access to electricity.
- **Robustness:** Smart feature phones are better adapted to rural environments where they are more exposed to heat, dust and risk of damage from being carried in the fields.
- **Familiarity:** Having the same form factor as a basic or feature phone makes it easier for customers to begin using immediately, and some are likely to feel more confident using a familiar-looking handset.
- **Pre-installed apps**: The apps that come with the handset are customised to increase its relevance for customers in different contexts, including popular apps (e.g. WhatsApp, Facebook) and locally relevant ones (e.g. public services or agriculture apps). For example, KaiOS is working with NGOs and international organisations in LMICs to develop content for specific customer segments, such as farming content for rural users.
- **Social acceptability:** In more conservative settings, the limited number of features and browsing options can make smart feature phones more socially acceptable for women to own than a smartphone, as male "gatekeepers" seek to prevent female family members from being exposed to "inappropriate" content online.[26]

However, there are some trade-offs with smart feature phones. These include:

- **The cost savings from optimising smart feature phones will attract some customers but deter others.** When developing these phones, it is valuable to survey customers to understand their needs and what they consider essential features. For instance, qualitative research in several markets has shown that low-income customers place high value on the camera and often complain about the low quality of cameras on cheaper mobiles.
- **Smart feature phones are more relevant for some market segments than others.** For example, persons with disabilities need a range of accessibility features, such as image recognition apps and screen readers. While KaiOS has integrated a few accessibility features (Google Assistant, text-to-speech, etc.), this may not be sufficient for most persons with disabilities to use these phones autonomously.

25 Key stakeholder interviews.
26 GSMA. (2020). Reaching 50 Million Women with Mobile: A Practical Guide.

Providing customised smartphones to meet local needs at lower prices

Low-income, price-conscious customers are likely to be more willing to pay for an internet-enabled handset if they have already experienced the internet on someone else's phone. Yet, their ability to pay remains limited, making it challenging to purchase a device with features that meet their needs, aspirations and preferences. A promising approach has been taken by MNOs, handset manufacturers and pay-as-you-go (PAYG) solar companies, which have designed smartphones customised to the needs of end users in a specific market or region while also optimising the cost of components. For example:

- **Safaricom Kenya** launched their more affordable Neon smartphone range, designed to appeal to first-time smartphone users. A partnership with an original equipment manufacturer (OEM), combined with market research to understand customer preferences, allowed them to design the phones to better meet customer needs. For instance, the Neon Ray and Nova smartphones have a bigger screen, longer battery life and higher quality camera than the previous Neon Kicka smartphone. A low-cost sourcing approach and subsidies have helped make this handset more affordable for lower-income customers and increased customers' willingness to pay. Lower prices have also stimulated demand and helped Safaricom achieve economies of scale.

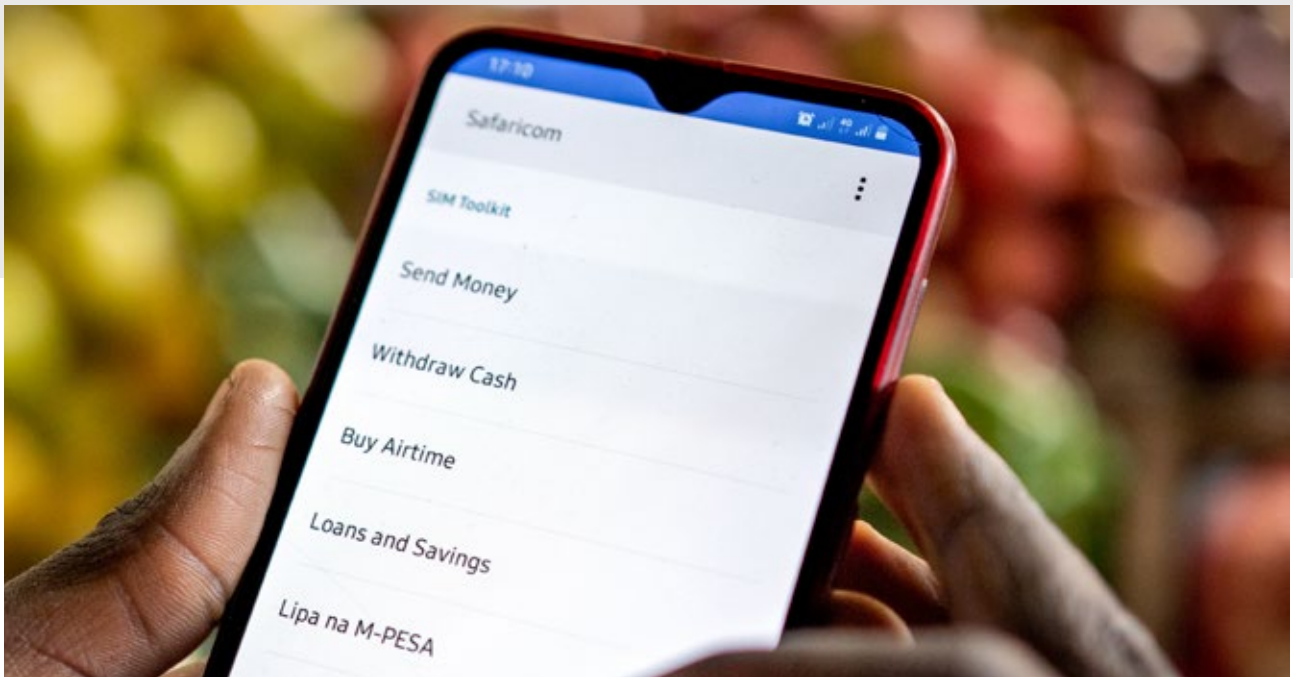
- **Transsion** has "glocalised" (i.e. adapted) their Chinese smartphones for African markets. The Tecno brand focuses on the specific needs of consumers in Sub-Saharan Africa, offering sophisticated handsets at lower prices. Transsion keeps costs down and lowers the retail price by leaving out high-end features, such as artificial intelligence (AI) assistants or cloud storage.[27] The handsets have a relatively long battery life, a dual SIM that gives customers the option to switch mobile operators to get the best signal and cost, a camera that is better calibrated for darker skin tones and local language scripts, such as Amharic.[28] Durability and customer care are a focus of the brand, and Transsion has for example created a partnership with Calcare to establish customer service centres in several African markets.

27 Adepoju, P. (3 October 2019). "How thinking and acting local took Africa's top-selling phone maker to a multibillion-dollar IPO". Quartz Africa; Dahir, A.L. (30 August 2018). "A low-profile, Chinese handset maker has taken over Africa's mobile market". Quartz Africa.
28 Jeffrey.W. (7 February 2021). "Why did Transsion become the Apple of Africa?" PandaYoo.

Key considerations when lowering production costs

As seen in Chapter 2, when driving the absolute cost of a handset, it is also important to ensure that the handset meets the needs, preferences and digital capabilities of the target end users. Considerations include:

- **Building more robust handsets to make them last longer.** For example, strengthening the outer shell of the handset by adding protective elements made of robust materials. Rather than looking for the cheapest components at all costs, consider the best price-to-quality ratio of the various handset parts to help the phone last longer.
- **Designing a handset for an appropriately sized target group.** Carefully consider the trade-off between tailoring a handset to a target population and the need for high volumes for the business model to be viable (particularly for handset manufacturers).
- **Differentiating the internet-enabled handset from a feature or basic phone.** Customers will need to see the value of purchasing an internet-enabled handset. This is particularly relevant when promoting a smart feature phone that is intended to be a stepping stone to purchasing a smartphone. Carefully consider the trade-offs between a phone that is familiar or more socially acceptable and one that is different enough to increase customers' willingness to pay.
- **Pre-installing apps that are relevant to the target segments.** To make internet-enabled handsets more relevant for consumers, apps for farming, health and/or education can be pre-installed. Identify the target segment's priority needs and motivating use cases and communicate the benefits of using mobile internet.[29]



29 For more details on life needs and how the internet can fulfil them, see: GSMA. (2021). Understanding people's digital skills needs: Insights from India and Ghana.

Reducing handset costs through more efficient procurement, distribution and marketing

Beyond reducing production costs, providers are creating efficiencies throughout the value chain to make handsets more affordable.

Reducing procurement costs

Aside from standard procurement cost-reduction strategies, there are several other ways to reduce procurement costs and bring down handset prices for end users, including:

- **Pooled procurement:** this can help achieve economies of scale and lower prices. MTN, for example, centralises the procurement of all MTN Group approved devices for all in-country MTN businesses.
- **Vertical integration:** when a company owns and controls more than one part of the supply chain, they can streamline costs and reflect these savings in the price of their handsets, for example, an MNO or PAYG solar company that controls the design and distribution of a smartphone. Moon, for instance, designed the Moon phone to meet the needs of rural inhabitants in LMICs by balancing affordability with robustness and quality. Distribution is primarily conducted door-to-door by a network of Moon agents.
- **Direct sourcing:** when MNOs form partnerships with manufacturers to produce own-brand handsets, they avoid royalty fees from other branded handset companies and potentially benefit from bulk purchasing. This allows them to pass on the savings to consumers.

Partnerships for last-mile distribution

Most of the world's unconnected live in rural areas where transportation and logistical costs make distribution much more expensive than in urban centres. This makes the retail price of a handset higher for rural customers. For example, in Bangladesh, rural customers can pay 15 to 20 per cent more for similar handset models in urban areas.[30] Lack of availability of handset models is another issue for those living in rural areas. The cheapest handsets on the market are not always available locally, forcing rural customers to travel to urban areas (incurring transportation costs) to access a wider range of more affordable devices.

MNOs control only a small share of the handset market and only in countries where they are allowed to do so. Although they may manage a limited number of points of sale (PoS), they are generally in urban or peri-urban areas. The distribution of handsets, especially in rural areas, is therefore primarily the job of third-party distributors and retailers, including informal ones (e.g. informal markets, street vendors). Across LMICs, most handsets are sold informally, particularly in rural areas.[31]

The convergence of commercial interests to improve the availability and affordability of internet-enabled handsets has created new opportunities for partnerships between the mobile industry and organisations with last-mile distribution networks. These partnerships reduce distribution costs and help the mobile industry ensure that customers can access more affordable handsets, particularly in rural areas. Distribution costs can be pooled with other products, such as solar home systems (SHS). The PAYG solar industry, for instance, has developed strong distribution networks in rural areas (e.g. Baobab+ and M-KOPA).[32] To make the most of these partnerships, MNOs can partner directly with PAYG solar companies to embed their SIMs in the smartphones they sell.

Handsets can also be distributed through e-commerce platforms and structured agent networks such as Copia, a catalogue sales model to improve last-mile distribution to those who are not yet mobile internet users in Kenya and Uganda. This model targets people who do not have access to (or do not feel comfortable ordering from) e-commerce platforms. Customers visit a local agent to order a handset from a catalogue of small appliances.[33]

> "In informal (often rural) areas, 50 to 70 per cent of device sales happen informally. There are no fixed handsets costs or strong bargaining behaviour, which makes it more difficult to ensure affordability of the devices in these areas."
>
> **Charlene Munilall, General Manager, Devices, MTN Group**

Partnerships to share marketing costs

Marketing partnerships can both raise awareness of affordable handsets and share the advertising and other marketing costs that are ultimately reflected in the handset price. These partnerships can be particularly appealing for saving costs in reaching larger target audiences. For example, under the Maisha ni Digital initiative, Safaricom and Google ran a co-marketing partnership to optimise their resources for greater efficiencies. Similarly, Samsung is financing advertising campaigns in Kenya (notably radio adverts) to promote the sale of its smartphones through M-Kopa financing plans.

30 Key stakeholder interview.
31 Key stakeholder interviews.
32 PAYG players have expertise in offering financing options to their customers, which low-income rural populations often require to purchase an internet-enabled device (see Chapter 3).
33 For more details, see: https://agfundernews.com/copia-globals-50m-round-proves-investor-interest-in-africas-oft-ignored-rural-consumer.

Considerations when creating more efficient marketing and distribution

In addition to more efficient marketing and distribution, which can lower retail prices for consumers, it is important to demonstrate the value of a handset and mobile internet, as this increases customers' willingness to pay. Considerations include:

- **Bundling products to increase customers' willingness to pay:** Offering a mobile data pack to customers who purchase an internet-enabled handset can increase the perceived value of the handset. For example, free data is often offered to PAYG solar smartphone customers; Safaricom offers a YouTube plan for 20 per cent of its value to allow customers purchasing handsets through their Lipa Mdogo Mdogo service to stream content; and Jazz Pakistan provides free access to social media sites for the first three months after purchasing one of their smart feature phones.

  In many markets, data is costly, limiting a customer's ability to try different mobile internet use cases. Bundling products therefore addresses the data affordability barrier, helping customers make the most of their first internet experience and reducing ongoing data costs. Providing an initial data pack or recurring data bundle at the PoS has proved successful at enabling customers to try out mobile internet and discover the various benefits. For MNOs, it significantly increases ARPU after a few months as customers become regular mobile internet users.

> "The objective [of reverse data bundling] is to get customers to experience the full benefits of a smartphone and remove barriers - notably fear of spending too much on data usage at first."
>
> **Charlene Munilall, General Manager, Devices, MTN Group**

- **Educating customers about the value of a handset and internet connectivity and giving them the confidence to use it.** Using sales agents to educate local retailers and customers can raise awareness of affordable handsets that meet consumers' needs and give them the confidence to purchase them. For example, KaiOS in Africa is training retailers on the difference between a 2G feature phone and a smart feature phone so that they can justify the price difference between the similar-looking handsets to customers and boost smart feature phone sales. Offering support to set up a phone can be a particularly effective way to attract female customers and those with lower digital skills and confidence.

- **Ensuring effective distribution of cheaper handsets in all channels.** Explore the market context to see whether smart feature phones and ultra-low-cost smartphones can be integrated in a standard product portfolio and made available at all PoS (owned, franchisees, third-party and informal) at the same retail price.

Applying circular economy principles to offer handsets at a lower cost

The circular economy is an approach to economic development that is designed to benefit businesses, society and the environment by gradually decoupling growth from the consumption of finite resources.[34] With mobile handsets, initiatives have emerged to repair and reuse them. This increases the affordability for the next owner while reducing both e-waste and the use of raw materials.

Buying back pre-owned phones that people no longer want and selling them at a discounted price is an approach used by several industry players in LMICs. It impacts affordability in two ways:

- Sellers receive money to dispose of their old phone and increase their buying power to upgrade to a new phone; and
- Buyers can buy good-quality pre-owned phones at lower prices than if they bought the same model new.

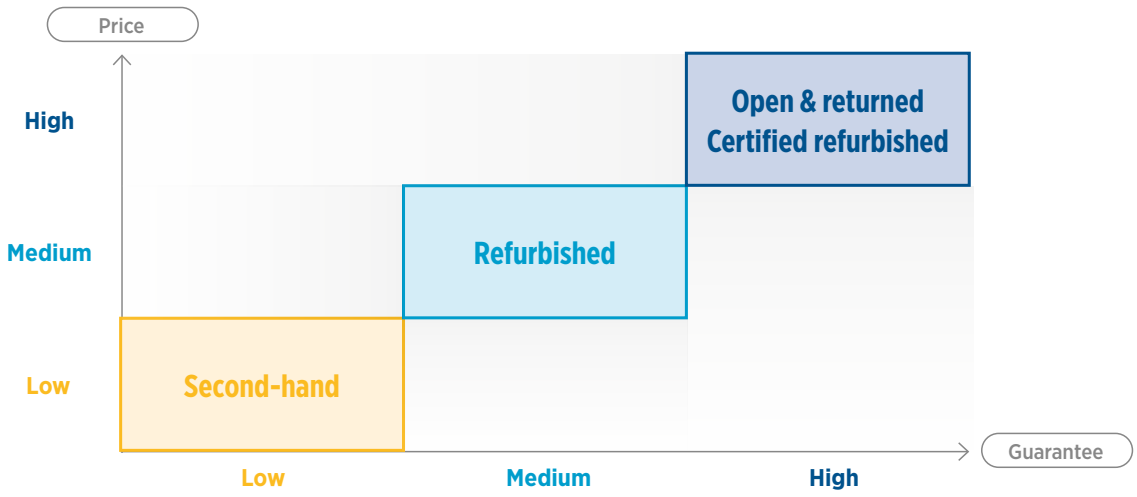
34 Ellen MacArthur Foundation. (n.d.). "What is a circular economy?" .

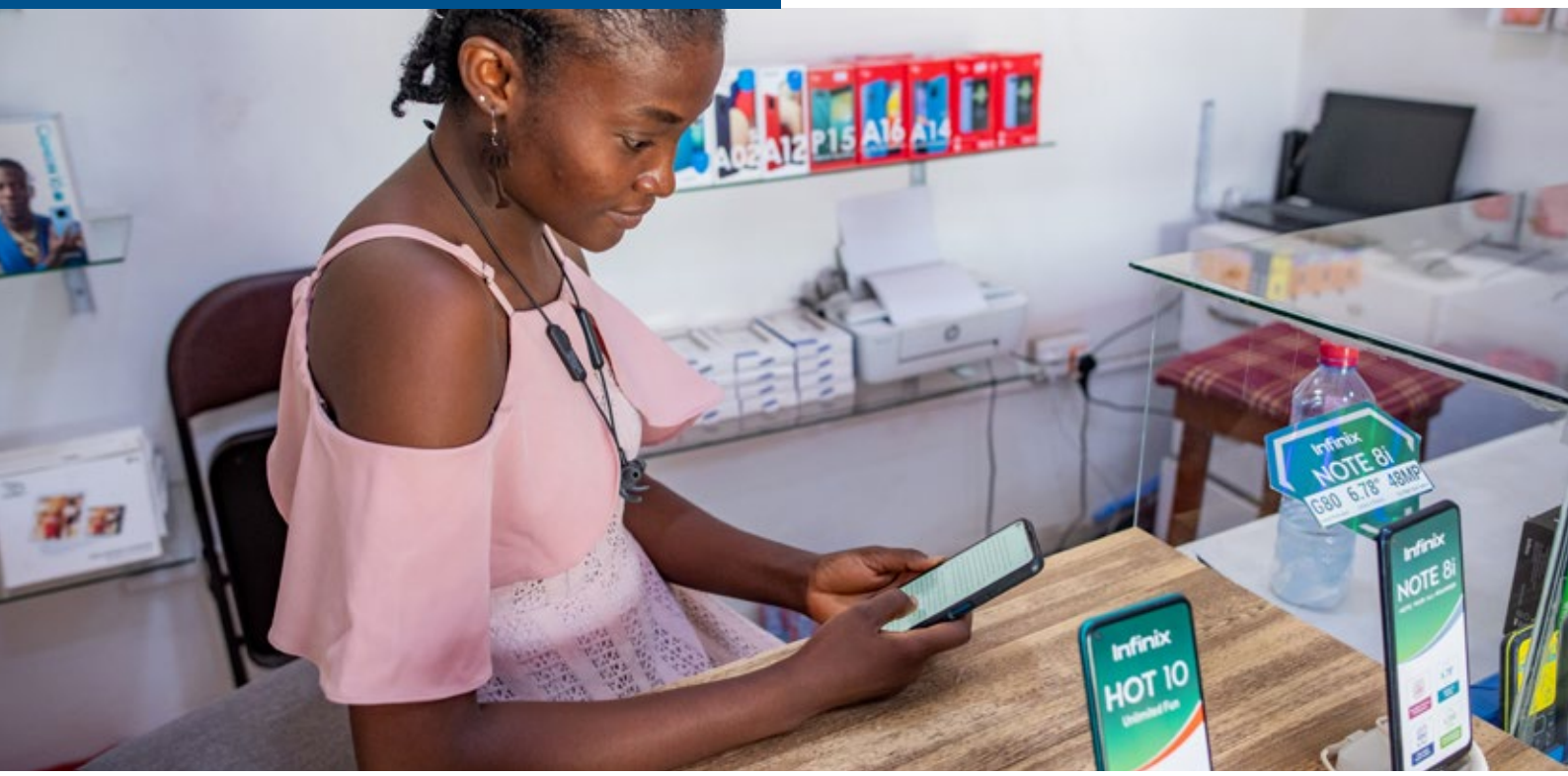
Different types of pre-owned phones are available in the market, with different prices and levels of guarantee (see Figure 5):

- **Second-hand phones:** used phones that are directly sold or given to individuals (e.g. as sales or gifts between friends and family members) or through an intermediary (retailer, marketplace). They tend to be cheaper than other types of pre-owned phones and the price is often negotiated (no fixed price). However, there is no guarantee of the quality of the phone.
- **Refurbished phones:** pre-owned phones that have undergone a series of tests and, if necessary, repairs, by a specialised private company to guarantee they are operational. Phones are generally graded based on their quality; the lower the grade, the higher the discount offered. Refurbished phones are sold with a guarantee of approximately six months.
- **Certified refurbished:** pre-owned phones, generally renowned brands (e.g. Apple, Samsung, etc.), that have undergone a series of tests and repairs by the handset manufacturer itself or by a licensee. The most sensitive parts of the device (battery, outer shell, accessories, cables, etc.) are generally replaced to guarantee the best quality to the buyer. Certified refurbished phones are often sold with a one-year guarantee.
- **Open and returned:** phones that have been bought by consumers and opened, but not used. They are in perfect condition, but cannot be sold as new. They are generally sold in specialised marketplaces and come with a guarantee.

Figure 5

Price and guarantee levels of different types of pre-owned handsets



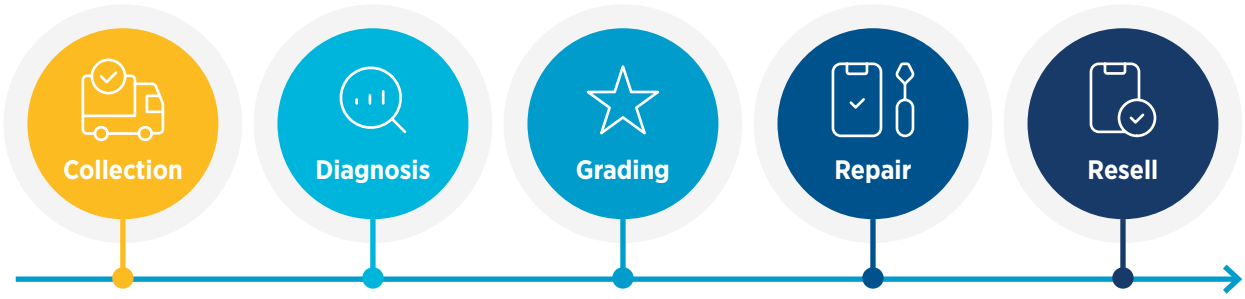


Price discounts for pre-owned handsets can range from 10 per cent to 80 per cent of the original price depending on the brand, model and condition (grade). Of the four types of handsets in Figure 5, refurbished handsets are a particularly good option for lower-income populations in LMICs who could afford to buy a handset in lump sum. Certified refurbished and open and returned handsets remain expensive and are only available for very high-end brands. Second-hand phones, which are currently the "go to" option for many end users, have no guarantee. Refurbished phones offer customers the right balance of affordable and quality-assured handsets, with a wide range of models to choose from.

The refurbished business model has five main steps to connect handset sellers with buyers (see Figure 6).

Figure 6

The refurbished business model



In 2019, 207 million refurbished devices were sold globally and the market is expected to reach 333 million units by 2023.[35] The model is maturing in high-income markets but still emerging in LMICs, notably in Asia, and is at a nascent stage in Africa.[36] Pre-owned phones can appeal to certain customer segments such as women, who often value the functionality of a mobile over the social status it can bring, and who are likely to be more price conscious (see Box 3).

The refurbished phone market is likely to be driven by increased regulation of e-waste. Many handset manufacturers are positioning themselves in this space and several have launched their own exchange or buy-back programmes (e.g. Apple and Samsung), or they are looking at establishing partnerships with existing refurbishing companies (notably in India).

Box 3

Instacash: refurbished phone marketplace using a C2B2B[37] model

Instacash is a company that buys used smartphones then refurbishes and resells them to distributors, wholesalers and retailers. It has a presence in seven Asian markets (India, Malaysia, Singapore, Hong Kong, Vietnam, Philippines and Taiwan). Instacash has sold more than 300,000 phones since 2017 and has plans to expand into Africa. Their main innovation is an app that diagnoses a phone and proposes a price. If the seller agrees, an Instacash agent collects the phone and delivers it to an Instacash refurbishing workshop.

In India, for example, phone sellers are primarily in wealthier cities and buyers in lower income areas. Instacash is enabling people in the largest cities to upgrade their phones (and enhance their connectivity experience) by trading in their old phone and increasing their buying power. This also enables people in smaller cities to access a better quality, refurbished smartphone with a guarantee at an affordable price. For some customers, purchasing a refurbished phone from Instacash gives them access to their first smartphone while others can upgrade from a low-end smartphone to a higher performing one. Instacash notes that their refurbished phones are particularly appealing to Indian women.

> “Most purchases are done by males who often buy for other household members, but we have noticed that women show a particular interest [in refurbished phones]. They give more importance to device robustness and capabilities while men tend to give more importance to the look and feel of using a brand new phone.”
>
> **An InstaCash partner, India**

35 IDC data as cited in Niu, E. (15 January 2020). The Market for Used Smartphones Is Booming as New Sales Plateau. The Motley Fool.

36 In Sub-Saharan Africa, there is currently a limited supply of mid- to high-end quality pre-owned handsets. To our knowledge, no company has made major breakthrough yet, but initiatives are emerging, such as Aion Sigma, which collects used smartphones in Europe and refurbishes and leases them via lending groups to female entrepreneurs in Africa.

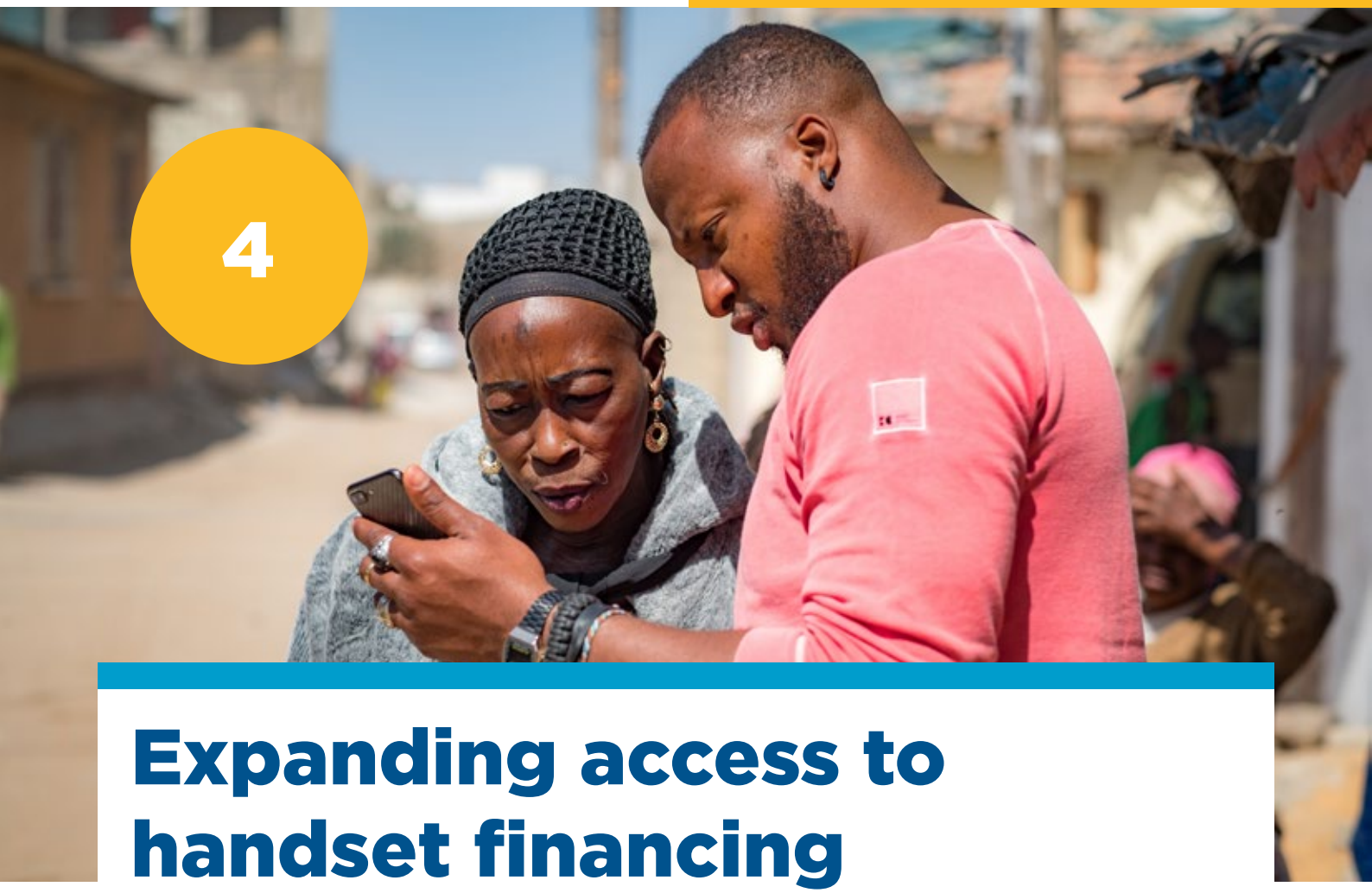
37 Instacash buys the handsets from individual customers and then resells the refurbishes phones to distributors that, in turn, sell them to wholesalers and retailers.

Considerations when reaching underserved populations with refurbished handsets

Given the growing number of smartphones in circulation, the refurbished handset business model has potential to achieve scale. However, as an emerging industry, it will need to overcome several challenges and build customer trust to reach underserved populations. Considerations include:

- **Building trust in refurbished handsets through customer education and guarantees.** Customers need to be reassured when buying pre-owned phones, since fraud and scams have diminished public trust. This has included the sale of counterfeit devices, falsely refurbished devices, the sale of stolen phones, the presence of malware and personal data not being fully removed from phones. There can also be a stigma associated with buying pre-owned handsets.[38] It is therefore important to create communication campaigns to raise awareness of the refurbishing process and the handset quality (through guarantees).
- **Promoting trade-ins rather than "hand me downs".** Encourage customers to exchange their old handsets for an upgrade instead of giving handsets away, which usually does not provide a high-quality internet experience for the recipient (old OS versions, low battery life, etc). Forming partnerships with refurbishing companies to outsource collection can make it easier for customers to trade in a handset, and partnerships for refurbishing and resale should also be considered.
- **Continue optimising each step in the refurbishment process to lower (re)sale prices.** Most stakeholders focus on refurbishing high-end smartphones as they bring the most value. However, making the business model more profitable would enable them to offer refurbishment options for low- to mid-end smartphones as well, thereby lowering the entry price of refurbished phones. For instance, the diagnosis step (see Figure 5) can leverage AI, enabling a prospective customer to use an app that assesses the device and predict its usability, lifespan and estimated price.

38 Key stakeholder interview with InstaCash.



4

Expanding access to handset financing

Access to financing is critical to enable those who are financially excluded, disproportionately women and those with low incomes, to purchase a handset for the first time and become connected. As the range of cheaper smartphones and smart feature phones expand, and various approaches and business models continue to bring down the cost of devices (see Chapter 2), there will be a point at which the price cannot fall much further, and affordability will need to be achieved through other means.

One of these ways is asset finance, in other words, offering financing options to a person so that they can own a handset, by spreading the cost over a longer period (with or without an upfront payment). This is particularly suited to those who are unable to make a lump sum payment for a handset, but who can afford to pay in instalments. For low-income end users, even the cheapest handsets available on the market can be out of reach if they have to pay for them upfront in cash.[39] Innovative "buy now, pay later" business models are now more accessible to a wider range of underserved populations, thanks to new approaches to credit scoring and handset locking mechanisms.[40]

39 Woodhouse, T. (2020). "Mobile devices are too expensive for billions of people — and it's keeping them offline". World Wide Web Foundation News and Blogs.
40 For a synthesis of asset finance products and business models, see: Mattern, M. (2020). Innovations in asset finance: Unlocking the potential for low-income customers. CGAP.

Access to finance is being expanded to those less financially included

Until recently, customers had five ways of financing a handset:

- Borrowing money from family or friends;
- Using informal and semi-formal lenders, such as village banks or self-help groups;
- Borrowing money from financial institutions (e.g. banks and microfinance institutions);
- Borrowing money from a mobile money provider using a savings and loan product (e.g. Safaricom's M-Shwari); and
- Receiving a loan after purchasing another asset (e.g. M-KOPA's cash loan to customers who have already made reliable payments for another product).

In recent years, innovative forms of financing have expanded access to finance to those without a formal credit history or account with a financial institution or mobile money provider. These are covered in the rest of this chapter and include:

1. Alternative data for credit assessment;
2. Remote locking of handsets; and
3. Flexible payment terms that better meet the needs of underserved customers.

Using more inclusive alternative data for credit assessment and opening access to credit for those most in need

Using alternative data for credit assessment is becoming a popular way to extend financial services to the underbanked and make internet-enabled handsets more affordable. Data can be obtained from multiple digital sources. For example, this approach is commonly used by digital financial service providers that offer unsecured microloans (e.g. Tala[41]), as well as mobile money providers, such as MTN's MoKash.[42] However, more recently it has been used to drive affordability of internet-enabled handsets, as more data has become available.

The use of "non-conventional" data to assess creditworthiness and eligibility for financing options is suitable for segments of the population that face disproportionate barriers to affordability, such as women, those with low incomes and those with insufficient financial data due to transacting only in cash.

More and more customer data is becoming available, and is needed to develop predictive algorithms (see Figure 7). MNOs collect basic socio-demographic information about their customers (at SIM registration) but, more importantly, mobile usage or mobile money data, which they can use to determine whether a customer owns a 2G or 3G/4G device, how often and how regularly they top up and the financial flows in their mobile wallet. PAYG solar companies and lending institutions also collect data on a customer's current or past repayment behaviours that can be used for credit scoring.

41 See: https://tala.co.ke/

42 For more information on MoKash, see the case study, "MTN MoKash: partnering to deliver savings and loans to unbanked women in Uganda" in GSMA. (2021). Reaching 50 Million Women with Mobile: A Practical Guide.

This data can also be helpful in identifying and targeting customer segments who do not yet own an internet-enabled handset. For Safaricom, for example, an alternative credit assessment and eligibility criteria for their handset financing scheme was key to increasing the number of internet-enabled handsets sold to first-time internet users and reaching rural customers.

Figure 7

Examples of digital data that can be used to assess eligibility for credit

Transactional data

- Mobile money usage
- Mobile usage
- Top-up frequency
- Prepaid load
- Financial flow on mobile wallet
- Bill payment

Example: In Uganda, MTN built its own credit scoring system based, among other indicators, on voice and data usage and longevity on the network to target eligible customers with their "Pay mpola mpola" finance scheme.

Non-transactional data

- Socio-demographic data of mobile (or mobile money) owners (e.g. gender[i], location, mobility)
- Asset ownership (e.g. mobile ownership (e.g. 2G, 3G or 4G handset)
- Behavioural traits (e.g. existing or past customer repayment behaviour[ii])

Example: A farmer's economic identity can inform credit assessment. Collecting farmer profiles and farm data has become easier and less costly thanks to digital agriculture solutions. Data on land ownership, household composition, income per harvest, are just a few examples of predictors of credit risk assessment.[iii]

i) It is worth noting that gender data can be inaccurate or incomplete. For more information, see GSMA. (2018). The Gender Analysis and Identification Toolkit. Estimating subscriber gender using machine learning.

ii) https://www.cnbc.com/2020/01/03/start-up-uses-mobile-data-as-a-credit-score-for-the-global-unbanked.html

iii) For more details see GSMA. (2021). Agri DFS: Emerging business models to support the financial inclusion of smallholder farmers.

There are some limitations to alternative credit assessments, however. Given the regulatory constraints that limit data sharing, credit scoring is primarily used by the companies offering the financing themselves, rather than through partnerships, which would require data sharing. Furthermore, many underserved customers have not generated enough digital data to be credit scored and lack the collateral to secure a loan.

Remote locking for handsets

Mobile phone locking technologies have created new opportunities for handset financing for low-income customers. These technologies allow lenders to remotely lock an internet-enabled phone in case of non-payment and limits the costs and risks associated with repossessing the handset in case of non-payment. Almost everyone is now able to access handset finance, including customers who cannot be credit scored by using their handset as collateral.

While this technology is not new, it was initially compatible with only a few models, mostly high-end smartphones. PAYG solar companies have been among the first to seize the opportunity and replicate the successful SHS model with smartphones (see examples in Box 4). As the technology has evolved, some software companies, such as PayJoy and NewPath, have specialised in smartphone finance with remote locking and formed partnerships with lenders to offer financing options. Some manufacturers have also developed their own locking technology.

Locking mechanisms can be customised to fully lock a handset, rendering it unusable, or gradually removing only certain desirable functionalities. For example, in 2020, Google, in partnership with Safaricom, launched its device-locking app that enabled Safaricom customers to purchase a smartphone in instalments under the Lipa Mdogo Mdogo financing plan. In case of non-payment, the handset can be gradually locked remotely, restricting access to mobile internet after four days of non-payment and stopping outgoing calls and SMS after seven days.

The continued improvement of locking technologies, which is soon expected to work on all types of internet-enabled handsets, is likely to have a major impact on handset finance. The introduction of a remote locking mechanism has improved loan repayments, making financing less risky for providers.

> "KaiOS developed a locking technology that will enable it to offer financing options. It is an innovative solution as there is currently no option available on the market to lock such low-cost phones. If KaiOS and its financier manage to offer 10 USD financing thanks to the lock, then 4G smart feature phones (which retail at ~20 USD) will be at the same price as 2G feature phone (which retail at ~10 USD)."
>
> **Sebastien Codeville, CEO, KaiOS Technologies**

Flexible payment terms for underserved customers

MNOs and other stakeholders have been testing different payment modalities that suit the income patterns of underserved customers. In LMICs, a large share of the population's income is unpredictable and prone to fluctuations or seasonal variations.[43] Allowing micropayments and flexible payments is crucial, especially for populations who earn income on a daily basis. For instance, allowing consumers to repay whenever they have money available within a certain timeframe, rather than fixed payment plans, is particularly well suited to individuals earning irregular incomes, such as farmers.

Some examples of flexible payment options include the following:

- In Uganda, MTN offers their customers a way to purchase a 4G MTN Kabode smartphone in instalments over a six-month period, allowing early payments and daily, weekly or monthly payments, as long as the required monthly amount (UGX 20,000 UGX or ~$5.70) is paid by the end of the month.
- d.light offers their customers flexibility in paying their loans for an SHS, a smartphone or both, by allowing them to postpone their payment and extend the repayment period if they have not earned enough money.
- In Malawi, TNM, in collaboration with Strategic Impact Advisors, offered a feature phone in instalments to farmer-based organisations. To deal with the lack of collateral, it was key for the initiative to have a trusted intermediary (lead farmers). Payments were collected by lead farmers over a three-month period, providing the community pressure needed to guarantee payments. Such an approach to repayment can also provide an opportunity for the unbanked to access an internet-enabled handset.[44]

Commercial impact of handset financing

Handset finance is a growing business, with MNOs and PAYG solar providers reporting increased sales volumes. Although it can take a great deal of time and resources to get the model right with the right partners, it can have a significant impact. For example, a partnership between Google and Safaricom in Kenya to offer more affordable smartphones has prompted Google to actively work towards replicating the handset finance model globally. The introduction of a locking mechanism has also proven successful in reducing customer default. However, the long-term success of handset finance will depend on how it is applied and on process innovations that ensure the model is a right fit for the market, and payment milestones are incentivised efficiently to drive scale.

43 Global Infrastructure Hub. (n.d.). "Affordability and Optimising Finance".

44 While this example is based on feature phones, the approach is still relevant for internet-enabled handset finance. For more details on the initiative, see: https://www.siaedge.com/news/2020/8/13/making-mobile-phones-affordable-in-malawi.

Box 4

Examples of handset financing business models in the PAYG solar industry to reach different customer segments

	M-KOPA Kenya, Uganda, Nigeria, Ghana	**Moon** Senegal
Product	• Mid- to high-end 4G smartphones (Nokia, Samsung) • Remote locking mechanism • Free daily data bundle	• Moon 3G and 4G smartphones (dual SIM, robust screen) • Pre-downloaded apps adapted to customer needs • Bundled with SHS, including locking mechanism
Finance plan	• Deposit + micropayment plan, typically over 12 months	• Deposit + flexible payments up to 12 months • Discounts for monthly or biannual repayments
Target customer segment	• Underbanked, with variable income who can afford to make a down payment • Must have proof of ID and active digital wallet	• Rural first-time smartphone users • Women • Must be a mobile money customer
Channels	• M-KOPA agents • MNO retail stores and franchises • Online	• Physical branch network • Door-to-door
Key partners	• MNOs (Safaricom, MTN, Airtel) • Remote locking company • OEM (warranty) • Retailer (Simba Telecom)	• OEM • Remote locking company • Funders

To date, M-KOPA PAYG smartphones have been most popular among urban customers and those upgrading their handsets. Seventy-five per cent of customers are first-time 4G smartphone users and 30 per cent are purchasing a smartphone for the first time.[45]

Eighty per cent of Moon customers are first-time internet users. Moon specifically targets women since their data shows that women have significantly higher repayment rates than men. Women are encouraged to subscribe and offered a discount when the subscription is paid from a mobile money account owned by a woman, since they are less likely to default.

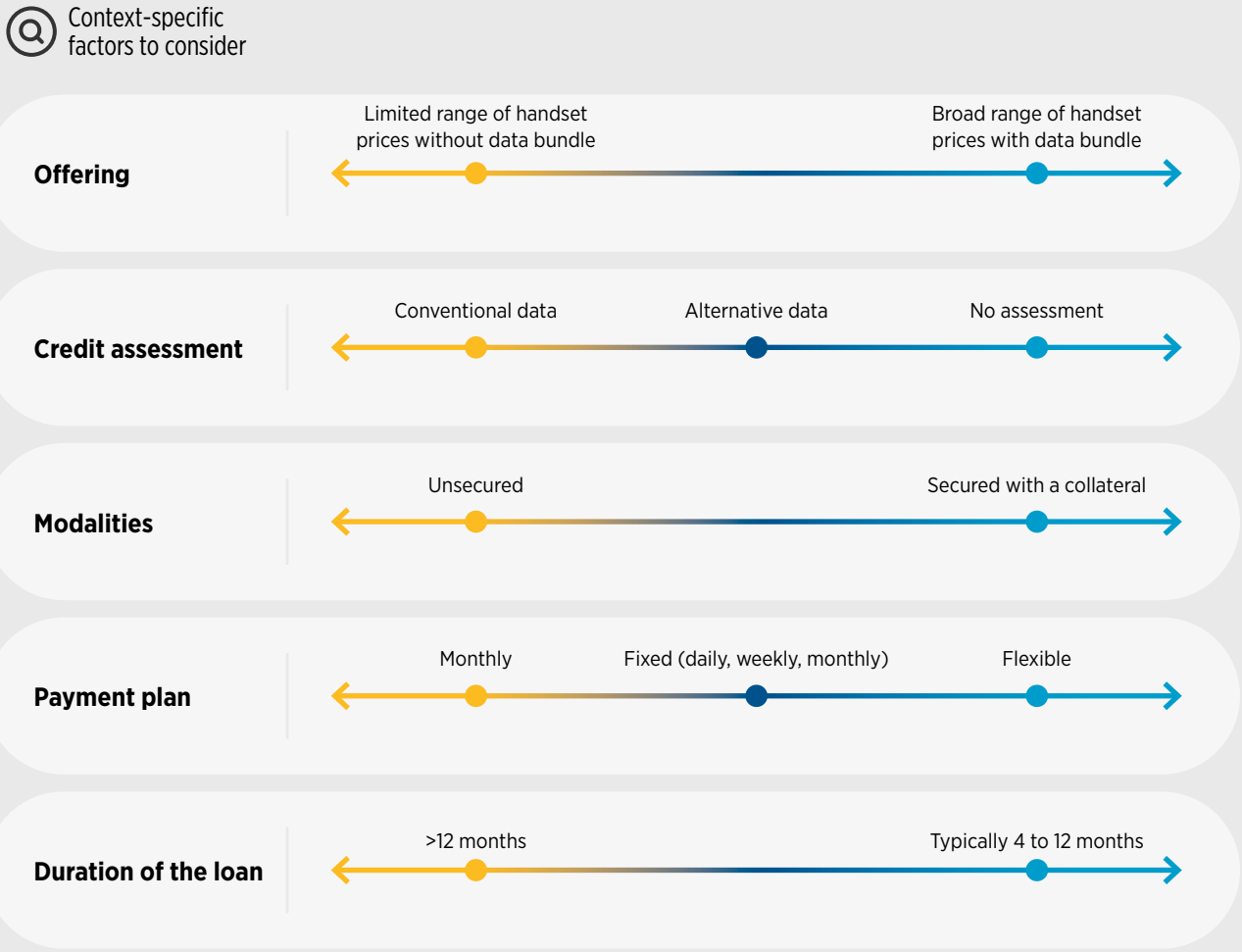
45 For more details, see: GSMA. 2022. M-KOPA: Applying the Pay-As-You-Go Model to Smartphones in Africa.

Key considerations when providing handset financing

As shown in Figure 8, there are context-specific factors to consider when developing an appropriate and inclusive handset finance business model.

Figure 8

Balancing handset finance risks for the provider with customer reach in LMICs[46]



46 For more details on managing risk in asset finance for low-income consumers, see: Waldron, D. et al. (June 2021). Getting Repaid in Asset Finance: A Guide for Managing Credit Risk. CGAP.

Providers should also consider the following when designing and implementing handset financing initiatives, as these will help ensure they reach underserved populations and are commercially sustainable:

- **Offer a quality handset.** Offering a well-designed, robust and durable handset on credit is important and in the interest of both the credit provider and the borrower. If the device fails during the payment term, there are risks for both parties: the credit provider would face a loss if customers default on a phone that does not work and incur a negative impact on their brand, while low-income customers who are paying interest over time would suffer a financial loss if they could no longer use their phone bought on credit.

- **Consider providing a choice of repayment options.** These can be designed to meet the different needs and circumstances of customers in a particular market and encourage timely repayments. For example, for those who are unbanked, consider options such as paying in cash instalments at a retailer or via farmers' or women's groups.

- **Consider gradual locking options to encourage repayment.** For example, locking only certain functions or apps or locking the device on a specific day or time of day. From an ethical standpoint, it is important for consumers to still be able to access the essential functions of their handset (such as receiving and making calls), and in some countries this is a regulatory requirement. From a commercial perspective, the objective is not to penalise the customer, but incentivise them to pay. Creditors can apply a customised "light lock" to improve the customer repayment experience and differentiate themselves from the competition. To improve brand perception and meet customer needs, ensure that unlocking the handset is a smooth process for the customer, such as via an SMS rather than requiring the customer to visit a retailer.

- **Invest in customer education.** Advising and guiding consumers so that they understand the repayment commitment and the implications of defaulting is critical to ensuring an ethical business model. Educating consumers (through various formats) on the benefits of enrolling in a finance plan, and the risks associated with credit default, also encourages positive credit behaviour and reduces the need to use remote locks. These actions are also likely to contribute to a positive brand perception, encourage referrals and help financing initiatives to scale.

- **Develop partnerships to offer financing options.** Financial business models that make handsets more affordable can be complex to implement and credit risk can be high. Partnerships can help to address these challenges. These may include partnering with a device locking software company, handset manufacturers (as locking technologies are most often embedded at the manufacturing stage), financial service providers, MNOs and big data analytics companies. For example, in Bangladesh, Grameenphone partnered with Bank Asia and Cignifi (a credit and market analytics platform) on a three-month 4G device financing campaign targeting non-smartphone users to convert them to 4G devices.[47]

- **Beware gender bias and assumptions in credit assessment algorithms.** Despite evidence that women are often lower risk customers than men,[48] some algorithms used for credit scoring are biased, often unintentionally, and disadvantage women. For example, thresholds established for scoring may not reflect the consumption patterns of women (e.g. number of SMS sent, time spent on calls, amount of top-ups). This results in creditworthy women being more likely to be denied credit than creditworthy men, and can exacerbate existing gender inequalities.

Finally, it is critical to ensure that handset financing protects customers. As pointed out by the Consultative Group to Assist the Poor (CGAP), inclusive asset finance must emphasise core principles of consumer protection in financial services, such as transparency, fair treatment and effective recourse.[49]

47 For more details, see: https://www.grameenphone.com/about/media-center/press-release/grameenphone-and-bank-asia-introduces-device-financing-4g-handsets and https://newupdateoffer.com/gp-bank-asia-offer/

48 In the microfinance sector, data shows that women are associated with lower portfolios-at-risk and write-off ratios than men. See: D'Espallier B., Guérin, I. and Mersland R. (May 2011). "Women and Repayment in Microfinance: A Global Analysis". World Development, Elsevier, Vol. 39(5), pp. 758–772.

49 Mattern, M. (2020). Innovations in Asset Finance: Unlocking the Potential for Low-Income Customers. CGAP. pp. 10–11.

Box 5

Enablers and inhibitors of handset financing in LMICs

While every country is different, some general trends in Sub-Saharan Africa and Asia-Pacific are enabling handset finance while others are posing challenges to it.

Sub-Saharan Africa

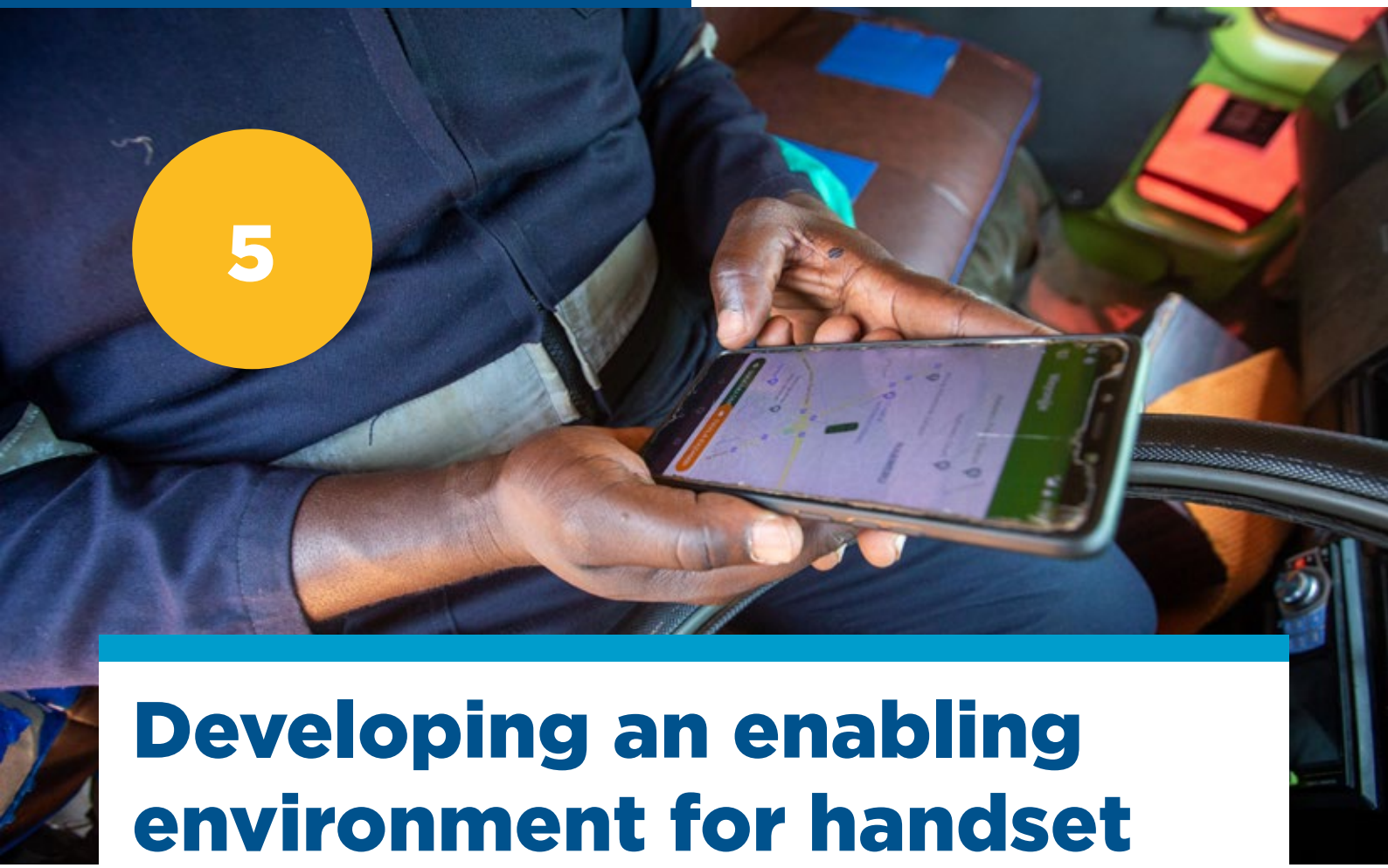
- ✓ **Well-developed mobile money ecosystems** are facilitating payment collection from customers and offering an array of financing schemes.[51]
- ✓ **A flourishing PAYG solar industry** with last-mile distribution networks in rural areas is providing opportunities for financing or cross-selling options.
- ✓ **Increasing penetration of smart feature phones** in many markets is providing a cheaper entry point for mobile internet than smartphones.
- ✗ **Expensive data costs** are limiting mobile internet use, especially for new users.
- ✗ **Smaller and more fragmented markets** (compared to Asia) limits opportunities to scale.

Asia-Pacific[50]

- ✓ **Large markets in some countries** are enabling economies of scale.
- ✓ **Many governments are promoting digitisation** to generate demand for mobile internet with digital skills training and digital public use cases.
- ✓ **Increasing penetration of smart feature phones** in many markets is providing a cheaper entry point for mobile internet than smartphones.
- ✗ **Less enabling regulations** have been introduced in several markets, such as high taxes on imported handsets, laws forbidding device locking, legislation preventing MNOs from selling devices and other regulations on mobile money.

  These restrictions limit opportunities for the private sector to innovate and test new initiatives to make handsets more affordable.

50 Low- and middle-income countries only.
51 For more metrics on the strength of the mobile money ecosystem in Africa vs Asia, see: https://www.gsma.com/mobilemoneymetrics/#global



5

Developing an enabling environment for handset affordability

It is in the interests of policymakers for handsets to be more affordable for a country's citizens. Mobile internet connectivity not only provides access to life-enhancing services, but also contributes to poverty reduction, economic growth and progress on the UN Sustainable Development Goals (SDGs).[52] Research in Tanzania, for example, has found that mobile broadband increases household consumption by seven per cent and reduces the proportion of households below the national poverty line by five to seven percentage points, mainly due to positive labour market outcomes.[53]

Despite the benefits of improving handset affordability, there has often been a greater focus on PC or laptop programmes with much less attention paid to handset affordability, even though most people in LMICs access the internet exclusively on a mobile device.[54]

Governments can contribute to making handsets more affordable by implementing policies that lower the cost of handsets and expand options for individuals to finance a device. This chapter outlines eight key policy considerations to improve access to internet-enabled handset ownership for the underserved. These are based on consultations with a range of stakeholders and are related to the approaches and business models discussed in Chapters 3 and 4. Many of these actions are connected and can be pursued in conjunction.

52 GSMA. (2021). 2021 Mobile Industry Impact Report: Sustainable Development Goals.
53 World Bank and GSMA. (2021). Mobile Broadband Internet, Poverty and Labor Outcomes in Tanzania.
54 GSMA. (2021). The State of Mobile Internet Connectivity 2021.

Policy considerations to lower handset costs

Reduce sector-specific taxes and fees

Taxes generally represent a significant share of handset costs (see Box 2).[55] Sector-specific taxes are often implemented on top of general VAT and customs duties in LMICs, with handsets regularly treated as luxury goods. These taxes impact underserved citizens disproportionately, including women, those with low incomes and people living in rural areas. This is a lost opportunity since these groups often have the most to gain from being connected. Several governments have introduced VAT exemptions on handsets. For example, following the removal of the 16 per cent VAT on mobile handsets in 2016, handset sales in Pakistan increased by 25 per cent.[56]

Sector-specific taxes should be phased out, as taxation over and above what is applied to other standard goods and services is not fully aligned with internationally agreed best practices. They also impact the poorest in society most. Ultimately, aligning tax policies with governments' digital inclusion objectives will bring sustained long-term benefits through the positive impact of greater connectivity on socio-economic growth.

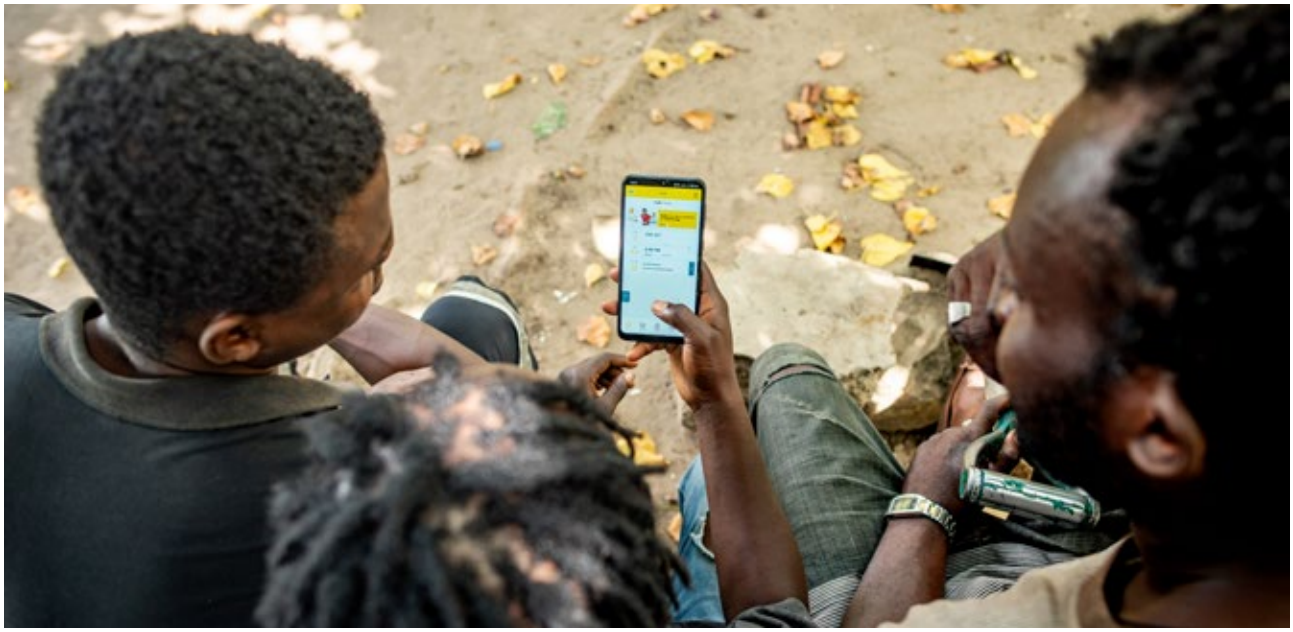
Consider handset subsidies for targeted user groups

Subsidies are another way for governments to provide more direct support to increase handset ownership. An effective way to increase internet uptake is to support 2G mobile phone users to gain access to internet-enabled handsets. Government support can be either through direct subsidies for targeted user groups (e.g. telehealth workers, microentrepreneurs, students, persons with disabilities) or by providing earmarked funds to third parties that provide devices to end users. For example, under the Connect Rwanda initiative, the Ministry of ICT and Innovation, together with MTN Rwanda, are donating smartphones bundled with three months of data to citizens who cannot afford them, such as women traders.[57]

Governments can also forge partnerships with the mobile industry to carefully plan handset affordability initiatives and define a clear strategy for identifying beneficiaries most likely to benefit. For example, Reliance Jio has participated in the Bhamashah Yojana scheme in India, introduced by the Rajasthan government, through which millions of JioPhones were distributed, primarily to women. As part of the Bhamashah initiative, the government will reimburse women who buy a JioPhone with a valid ID once they register on the Bhamashah app.[58]

So far, there is not much evidence of whether the free distribution of handsets alone is sufficient to drive digital inclusion. Subsidy schemes should, ideally, be accompanied by measures to address other barriers to mobile internet adoption and use, including digital skills training and ensuring that people see the value of owning a smartphone.[59] Policymakers should also engage with the private sector to carefully plan subsidisation initiatives to ensure they do not cause unintended market distortions.

55 GSMA. (2019). Rethinking mobile taxation to improve connectivity.
56 For more details, see: "Handset VAT exemptions in Pakistan" case study in GSMA. (2019). Rethinking mobile taxation to improve connectivity.
57 For more details, see: https://www.newtimes.co.rw/featured/connect-rwanda-minicom-donates-900-smartphones-cross-border-women-traders and https://www.newtimes.co.rw/technology/connect-rwanda-smartphone-household-every-village.
58 Government of Rajasthan. (2016). "Bhamashah Yojana: Building a New Rajasthan".
59 GSMA. (2021). Accelerating Mobile Internet Adoption: Policy Considerations to Bridge the Digital Divide in Low- and Middle-Income Countries.



Assess whether local handset manufacturing would lower the cost of internet-enabled handsets

Local manufacturing (which is often local assembly rather than the production of components) can create supply chain efficiencies by bringing manufacturers, MNOs and customers closer together. It can also increase the availability of quality handsets available on the retail market (as seen in Bangladesh[60]), remove the need for import taxes levied on locally produced devices, stimulate the economy by creating local jobs and provide an opportunity to export goods, generating additional revenues for the country.

While production costs and the cost of the (often imported) handset components remain high, local manufacturing can still reduce the cost of producing internet-enabled handsets and pass the savings onto consumers. It is important to conduct thorough cost-benefit analyses of local manufacturing (including whether there will be sufficient demand) and to carefully balance conflicting interests (for example, improving affordability and digital inclusion for the underserved population versus local job creation).

Several governments have shown an appetite for local manufacturing, sometimes by implementing protectionist measures that have left consumers worse off, especially when the local device industry is uncompetitive. Instead of imposing restrictions, governments could opt to implement policies that aim to attract or stimulate domestic or foreign investment in the local production of internet-enabled handsets while ensuring that domestic prices remain competitive and the quality and choice of handsets remain high. For example, India recently launched the India Production Linked Incentive (PLI) scheme to incentivise local mobile phone manufacturing. This incentive has given Reliance Jio the opportunity to supply their JioPhone Next handset locally. The benefits of the PLI scheme are generally passed on to consumers in the form of lower costs.

60 Local manufacturing in Bangladesh has increased the volume of quality smartphones on the market. According to a stakeholder interview, 80 to 85 per cent of smartphones sold are now made locally, while the market used to be flooded with low-quality smartphones manufactured in China.

Policy considerations to support handset financing schemes

Create an enabling environment for the development of innovative approaches to credit

Alternative credit assessments have the potential to greatly expand device ownership, as they could enable the many individuals in LMICs without a credit history to gain access to credit or third-party device financing.[61] Sector-specific restrictions that prevent the responsible development of alternative credit scores should therefore be reviewed and alleviated, while these approaches should safeguard a user's privacy and avoid over-indebtedness.[62]

Carefully consider policy positions that recognise the benefits of remote locking for both providers and consumers, but also protect consumers

Many successful handset finance initiatives use the handset as collateral. This means when payments are overdue, the device can be locked remotely. While remote locking technology has enabled many providers to offer financing for internet-enabled handsets to low-income customers for the first time, due to the reduced risk, remote locking can also have negative consequences for end users, and in some countries is not allowed as it may conflict with consumer protection laws. However, taking a balanced approach could greatly increase the willingness of providers to offer such schemes to the underbanked and should therefore be carefully considered.

Public-private partnerships to de-risk handset financing

Governments or other public partners can step in to take over some of the financing or credit risk of devices. For example, under the Rwanda Digital Acceleration Project funded by the World Bank, the Government of Rwanda is currently exploring financing options to facilitate the purchase of internet-enabled handsets by the lowest-income households, which are more difficult for the private sector to reach with credit and loan products. Another example is Bboxx, which recently signed a Memorandum of Understanding with the Government of Togo to offer PAYG smartphones to civil servants and public sector workers.[63]

61 For more information, see Costa, A., et al. (2015). Big data, small credit: The digital revolution and its impact on emerging market consumers.
62 Maze, R. and McKee, K. (2017). "Consumer protection in digital credit". CGAP.
63 Bboxx. (27 September 2021). "Bboxx and Government of Togo sign first ever MoU to sell smartphones". Press Release.

Indirect measures to improve handset affordability

Besides direct cost reduction and financing, there are more indirect measures that governments can consider to make internet-enabled handsets more affordable.

Stimulate demand by increasing awareness and willingness to pay

The price difference between a basic/feature phone and a smartphone can be significant. At the same time, there is often a lack of awareness among low-income customers of how they could benefit from these handsets or a lack of digital skills to enjoy a full range of mobile services. Governments can put policies in place to address the barriers preventing mobile internet adoption more broadly.[64] The more a customer sees the value that an internet-enabled handset can bring to their life, the more willing they will be to pay for it.

For example, the Government of Bangladesh is encouraging the adoption of mobile internet and has launched the Digital Bangladesh initiative to bring government services to all citizens' doorsteps through a combination of e-government services and physical service centres. This e-government approach creates use cases and points of contact between the unconnected and ICT that have clear potential to increase perceived value and improve digital literacy.

> "The government is encouraging demand through the development of Digital Bangladesh. The hope is that the provision of e-government services will stimulate demand for connectivity by creating usages that all citizens will need."
>
> **Banglalink**

Tackle the trade of stolen, fraudulent and counterfeit devices, and protect consumers

Stolen, fraudulent, and counterfeit handsets offer no warranty to the customer and can create a negative perception of handsets, as they are often of poor quality and have a short life cycle. They also have a negative impact on the mobile and mobile internet user experience and offer low value for money. They also impact governments, which forego tax and duties and must contend with increased crime. Monitoring handset IMEIs (International Mobile Equipment Identity) and blocking irregular handsets could have a significant impact on affordability, encouraging manufacturers to continue investing and bringing quality handsets to the market and building consumer trust.[65]

Some countries are considering the implementation of national lists of homologated devices to combat counterfeit or smuggled devices, which may require customers to register their details and devices centrally. Such pressure on customers creates an additional barrier to handset access and is unnecessary, as there are other ways to collect information on counterfeit or smuggled handsets. Where national authorities are considering introducing a system to block non-homologated devices, they should consider offering an amnesty to existing consumers who already have non-compliant devices, as the loss to consumers is significant. In addition, it is recommended that the funding model for such systems should not place a burden on end users (i.e. consumers and network operators) since they are not the cause of the underlying issue.

64 See also: GSMA. (2021). Accelerating Mobile Internet Adoption: Policy Considerations to Bridge the Digital Divide in Low- and Middle-Income Countries.

65 For more guidance on solutions to promote quality handsets, see: Gumbiner, J. (April 2018). Using IMEI control systems to combat stolen, fraudulent, and counterfeit mobile phones: A Colombia case study. IDC.

6

Prospects

Since the COVID-19 pandemic, internet-enabled handsets have become less affordable in many LMICs. On the supply side, handset costs increased in many LMICs in 2021, likely driven by a combination of factors including component shortages, higher logistics costs, currency devaluations and changes in the handset portfolios of operators and distributors to include more higher priced handsets (including more 4G-enabled handsets). On the demand side, the economic consequences of the pandemic pushed more people into poverty, which had a major impact on the buying power of many lower-income individuals.

Still, the pandemic magnified the importance of being connected, especially to maintain social connections, access education or earn an income from home. Governments, often in partnership with other organisations, played an important role by creating new use cases, improving coverage in remote areas, lowering data costs and other efforts. This contributed to an increased demand for handsets that allow for a better browsing experience. In some markets, there has also been higher demand than usual for financing schemes to purchase handsets. In a post-pandemic world, handset financing is now more critical than ever to break down the cost into more affordable tranches for underserved customers.

As this report has highlighted, much progress has been made to drive affordable internet-enabled handset ownership since our last report in 2017, especially through the development of tailored solutions to provide handsets to a wider range of consumers. Handsets have diversified in both form and functionality, and financing schemes have expanded, providing connectivity options to more underserved customers.

The expert stakeholders interviewed for this research do not foresee other product innovations causing significant disruption to the market in the coming years. Rather, process innovations and improvements to the technologies presented in this report (e.g. locking technologies for smart feature phones, diagnostic algorithms to estimate the remaining lifetime of pre-owned phones) are expected, along with greater collaboration among key industry stakeholders.

Entry-level internet-enabled handsets costs are not expected to decline much more, but the price-to-performance ratio is likely to improve

Economies of scale in manufacturing have already been achieved by several industry players, handset manufacturer margins are low (reportedly only a few percentage points), particularly on low-end devices and component prices are not likely to decline further. Therefore, it is more likely that future innovations will drive down the cost of the newest and more expensive handset features, thereby reducing the price of higher-end devices. As for entry-level devices, their performance (specs) relative to price is likely to increase, but prices are not expected to drop much further.

Progress in handset affordability is more likely to come from stronger industry partnerships and a supportive enabling environment.

Industry players can focus on strengthening partnerships and cooperating to realise synergies, pool resources and iterate business models. This will help them refine their approaches and find efficiencies in the customer segments they target, as well as price propositioning, marketing and other areas. Once they find the right market fit, they will be able to scale their models.

Partnerships with government and an enabling policy and regulatory environment can also help make handsets more affordable for underserved citizens whose key barrier to connectivity is affordability.

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GSMA website at www.gsma.com

GSMA HEAD OFFICE
Floor 2
The Walbrook Building
25 Walbrook
London EC4N 8AF
United Kingdom
Tel: +44 (0)20 7356 0600
Fax: +44 (0)20 7356 0601