

# USING ALGORITHMS FOR MOBILE DATA PRICING

How authorities may consider personalised pricing for mobile telephony and data services

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# USING ALGORITHMS FOR MOBILE DATA PRICING

## HOW AUTHORITIES MAY CONSIDER PERSONALISED PRICING FOR MOBILE TELEPHONY AND DATA SERVICES

### WHAT IS PERSONALISED PRICING IN THE MOBILE SECTOR?

Mobile providers have historically offered customers various ways to purchase their services. Tariffs have typically been split into “pre-pay” and “post-pay” models, with consumers selecting which better suits their circumstances: those on a tight budget or with a poor credit rating, along with occasional users, generally opt for pre-pay, while people who use their phone a lot sign up for post-pay. Within each tariff model, consumers can then typically select from a range of offers set at different price levels. For instance, consumers who intend to make active use of mobile services may sign up to pay a higher monthly fee in exchange for a greater volume of data than other users, but at a lower unit cost.

Now, however, with the advent of big data and machine learning, it could be possible for mobile providers to further tailor their offers to the needs of individual users or customer segments. For example, by analysing their usage, an operator could identify when and where individual consumers use mobile services, and for what purpose, thus possibly allowing them to design bespoke offers based on a range of factors. Such tariffs would not be made publicly available to all consumers (for example, they would not be posted on a provider’s website), but would instead be offered to targeted customers, based on their particular characteristics.

Although it still appears to be a niche practice, personalised pricing is starting to attract interest from sector regulators and authorities. For instance, in its Annual Plan of Work for 2020-21, Ofcom, the UK telecoms regulator, has said it will publish a discussion paper on personalised pricing.<sup>1</sup> And in South Africa,

### EXEC SUMMARY

Mobile telecommunications providers are increasingly using algorithms to set personalised offers for their customers. In a recent inquiry into mobile data pricing, the South African Competition Commission (SACC) raised a number of concerns about the possible impact of such pricing. Other authorities, including Ofcom in the UK, also plan to look at personalised pricing.

In this article, we review the SACC’s concerns and set out a series of questions for regulators to consider when examining this topic.<sup>1</sup>

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<sup>1</sup> Ofcom’s Plan of Work 2020/21, paragraph 3.12; published 30 April, 2020 [https://www.ofcom.org.uk/\\_\\_\\_data/assets/pdf\\_file/0029/194753/statement-of-com-plan-of-work-2020-21.pdf](https://www.ofcom.org.uk/___data/assets/pdf_file/0029/194753/statement-of-com-plan-of-work-2020-21.pdf)

the Competition Commission recently concluded a sector inquiry into data pricing, in which personalised pricing was a key issue.

## WHAT HAPPENED IN SOUTH AFRICA?

Reflecting the particular characteristics of the South African market – most notably, the very high levels of income inequality – local communications providers have sought new ways to enable consumers to access their services. Indeed, back in the 1990s, South African telecoms companies were among the first to launch pre-pay mobile services. And, more recently, they have launched personalised pricing platforms: Vodacom’s is called “Just 4 You” and MTN’s is “MyMTN”.<sup>2</sup>

At the same time, telecoms companies in South Africa, particularly mobile providers, have faced scrutiny in recent years over the pricing of data services, especially to poorer consumers. This led, among other things, to the country’s Competition Commission conducting a sectoral inquiry into the pricing for data services, with this inquiry concluding at the end of 2019. In its report, the SACC raised concerns around the impact of personalised pricing on both consumers and competition. In short, these were:

- Firstly, personalised pricing reduced the overall transparency of retail prices and resulted in consumers making poor decisions - to the benefit of the service providers. In addition, the SACC was concerned that if such pricing makes it difficult for consumers to know the effective rate they pay for data, they may find it harder to compare tariffs across operators. Ultimately, therefore, they will be less likely to switch, thereby reducing competitive intensity in the sector.
- And, secondly, that such pricing could have adverse distributional consequences - benefitting better-off consumers at the expense of those who are poorer. Most fundamentally, the SACC seemed to consider that the growth of personalised pricing could lead to what it classified as “anti-poor” pricing – with price reductions targeted at wealthier consumers not being passed on to those who are poorer, and those poorer consumers – who the SACC associated with being those who consume relatively less mobile data – paying higher effective prices per unit of data than higher income consumers.

## HOW SHOULD AUTHORITIES CONSIDER CONCERNS ABOUT PERSONALISED PRICING?

The SACC’s analysis drew comments from a wide variety of stakeholders, including consumer bodies and service providers. The main mobile companies defended their pricing practices and pushed back on the SACC’s concerns on personalised pricing. They argued that the SACC’s views were supported neither by the empirical evidence on pricing in South Africa nor by the economic theory of price discrimination, which could be considered a forerunner of more sophisticated forms of personalised pricing.

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<sup>2</sup> For instance, on its website MTN describes its MyMTN Offers as “voice and data deals [that] are based on your usage behaviour patterns, affordability and preferences and are designed to give you more value for your money”. When Vodacom launched Just4You bundles in 2015, it stated: “Just 4 You presents customers with personalised offers. For example, offers presented to customer A may not be the same as those presented to customer B.” <https://mybroadband.co.za/news/cellular/138038-vodacom-launches-just-4-you-bundles.html> Note, however, that consumers do not have to purchase the personalised offers advertised to them – they can, instead, continue to buy open market offers.

So, how should authorities consider the potential merits of personalised pricing? It is clear that, as is the case with standard price discrimination, compared to a situation where every consumer pays the same per unit price, some users are likely to benefit under personalised pricing while others may pay more. But how should the overall effect of these changes be assessed?

We believe a framework to weigh up the benefits of personalised pricing in an industry such as mobile communications should consider the following factors:

- Firstly, how competitive is the market in question, and how do providers compete?
- Secondly, is the increase in usage by those benefiting from lower prices likely to outweigh any reduction by those who may pay more?<sup>3</sup>
- Thirdly, regarding the distributional impacts, are lower-income and vulnerable customers more likely or not to be price-sensitive and thus benefit from lower prices? And, looking ahead, will this always be the case?

We expand on each of these questions below.<sup>4</sup>

## WHY IS IT IMPORTANT TO TAKE INTO ACCOUNT THE DEGREE OF COMPETITION?

There are good economic reasons for price discrimination, including the efficient recovery of fixed and common costs. If the market is relatively competitive, it is more likely that discrimination will enhance welfare. For instance, if a company has a group of customers with high brand loyalty (i.e. low demand elasticity) it could be tempted to charge them higher prices. If a rival can identify these customers, it could also set targeted offers to attract them. To put it differently, brand loyalty can't be so great as to make loyal customers pay any price, so if there is competition in the market, rivals can also use personalised offers to vie for these customers. In contrast, if competition is not effective, then personalised pricing could be used to extract monopoly rents from more customers.<sup>5</sup>

## WILL PERSONALISED PRICING INCREASE OVERALL WELFARE?

Personalised pricing is just another form of price discrimination, a practice that is allowed in many industries because it generally increases output. As with any other form of price discrimination, personalised pricing may lead to higher prices for some customers and lower prices for others.

Whether this will result in an overall increase in welfare is an empirical question that needs to be tested. As mentioned above, the more competitive the market, the more "protected" relatively inelastic customers are. But this is not the only protection they can get. For instance, individual customers could find out that they

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<sup>3</sup> In technical terms whether the "output expansion effect" (i.e. the increase in output following the reduction in prices to some customers) compensates for "the appropriation effect" (i.e. the increase in prices for customers with higher willingness to pay).

<sup>4</sup> The advent of personalised pricing could also raise a number of questions about how consumer data is used. We do not consider these questions in this paper.

<sup>5</sup> It is also important to take into account the impact of personalised pricing on competition, which is ambiguous. With personalised pricing (or broadly with price discrimination) it is easier for companies to target specific customer segments of rivals and lower prices without affecting the price charged to their own customers. This intensifies competition. However, it is also argued that price discrimination can reduce competition, for instance by making it easier to sustain predatory strategies.

are being charged high prices when they look at other companies' web pages, when they are approached by other operators or just when they are talking to friends and relatives. In other words, it's not sufficient to identify users' demand elasticity. It's also necessary to be able to charge inelastic subscribers higher prices. Thus, the ability of customers to find out about personalised prices and opt out of them (for instance by sticking with open market offers) limits the potential to raise prices for inelastic customers and boosts the chances that tailored tariffs increase welfare.

## HOW WILL PERSONALISED PRICING IMPACT SPECIFIC GROUPS OF CONSUMERS?

Regulators care not only about overall economic welfare but also about the impact on vulnerable customers. Even if personalised pricing leads to an increase in output, some people may be worse off. Depending on who they are, this could be considered problematic by regulators and society. Take the example of customers who have relatively inelastic demand because they are unable to switch. If this can be traced back to socio-economic factors (such as unemployment, lack of credit, low levels of literacy or cognitive abilities and so on), regulators are likely to intervene. However, it is first important to analyse the facts on the ground. For example, in South Africa the mobile operators argued strongly that personalised pricing was one of a number of pricing innovations designed to enable lower-income consumers to access mobile data services.

## WHAT MIGHT BE THE LESSONS FROM THE SOUTH AFRICAN CASE?

Price discrimination is common in the telecoms industry, but the SACC's inquiry has highlighted concerns that could arise as such discrimination becomes more sophisticated and increasingly personalised.

It is important, however, that any such worries are assessed against a clear and appropriate economic framework, to examine both the impact on overall welfare and any distributional consequences. While the latter may be particularly sensitive in countries with high levels of income inequality, fairness is also becoming an urgent issue in more-developed countries with lower levels of absolute poverty.

As a first step, it would seem important for any concerned regulator to demonstrate that it is indeed poorer people or other groups of vulnerable consumers who pay more as a result of personalised pricing, as opposed to the provider using personalisation to offer lower prices to those on lower incomes without then having to offer the same deal to better-off customers.

Where an authority does decide to step in, however, it will also be important that such intervention is proportionate. For example, prohibiting personalised pricing may limit service providers' ability to introduce innovative pricing models. Instead, concerned authorities may wish to consider specific safeguards, such as making sure that personalised pricing is well understood by customers. They could also introduce codes of conduct to protect the most vulnerable consumers, including those who find it difficult to switch provider.<sup>6</sup>

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<sup>6</sup> For instance, following the conclusion of its inquiry, the SACC reached a settlement with Vodacom which would allow it to continue offering personalised prices, though with various measures to increase transparency. <http://www.compcom.co.za/wp-content/uploads/2020/03/Vodacom-consent-agreement-press-conf-Speaking-notes-for-Commissioner-.pdf>

## CONCLUSION

The algorithms that make tailor-made pricing possible are here to stay. The big data, artificial intelligence and machine learning that underpin price personalisation for mobile telecoms services cannot be “uninvented”. By making mobile services more attractive, bespoke tariffs have the potential to increase overall welfare. Equally, as with all technological advances, some groups stand to benefit more than others. In considering these advances, regulators must work from a transparent, appropriate economic framework that takes due account both of the total welfare gains to society from innovative pricing and its distributional consequences.

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