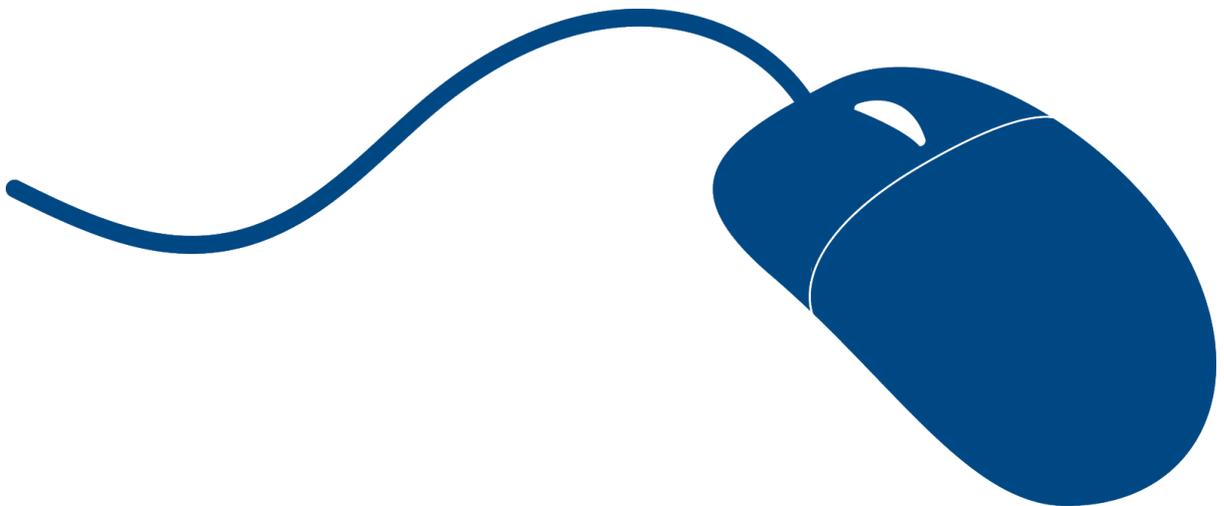


A price of one's own

An investigation into personalised pricing
in essential markets



Morgan Wild and Marini Thorne

Executive Summary

One of the most important things markets do is set prices for goods and services. But, prices tend not to be uniform: they are set in part by what companies know about what we are willing to pay. This is price discrimination and it's all around us. The incremental difference in firms' costs to make a small or large coffee, for example, or provide first and standard class rail travel, or produce 'value' and branded supermarket produce is relatively trivial. The different prices are largely driven by what we will pay.

Price discrimination is as old as the marketplace and *can* make markets work better by lowering prices for many consumers. But technological change is making it more prevalent, more intense — and more personalised. More personal data about us is being produced than ever before — for example, by 2020, 53 million smart meters in UK homes will be generating unparalleled levels of data about our energy use. Alongside this, internet shopping makes previously public marketplaces more private - there's a limit on how much price personalisation supermarkets can do, because everyone can see the price other people are paying. As markets go digital, this check on pricing strategies is diminished.

These are all potentially far-reaching changes to our economy. But we wanted to answer a specific question: **if firms use this explosion of personal data to personalise prices, what will this mean for the prices people pay for essential services?**

By their very nature, essential services are more important to consumers than other markets. Everyone needs household access to energy and water, and the lowest income households find themselves spending nearly 10% of their total expenditure on energy alone.¹ Increasingly, our economy and our lives are driven by reliable access to inexpensive broadband and mobile services. And postal services remain highly important for older and more rural consumers. When these markets fail, the consequences can be significant and costly. We need to be more alert to the potential downsides of major market shifts.

People tend to dislike personalised pricing. 84% of people said they felt uncomfortable with personalised pricing in essential service markets and 3 in 4 people say that if they encountered personalised pricing they wouldn't trust their provider.²

People do know that personalised pricing could happen and how to protect themselves. More than 85% of people know that adverts can be targeted using their browsing history, and 61% of people know that this can affect the types of offers that they might see. More than half of people know how to manage their data online - by clearing cookies, or changing privacy settings on emails and social media.

But most consumers don't maintain these practices on a regular basis - 1 in 3 people 'often' clear their browsing history and cookies. And only 1 in 5 people would definitely switch providers if they thought they were subject to personalised pricing.³

¹The lowest income decile spends 9.7% of its total expenditure on energy, as opposed to just 2.9% amongst the highest income decile. Office for National Statistics Data, [Family spending in the UK: financial year ending March 2016](#).

² Citizens Advice and ComRes nationally representative polling, July 2018, 2,848 responses.

³ Citizens Advice and ComRes polling, July 2018.

Personalised pricing might pose a risk to consumers by increasing disengagement - particularly in essential markets that are already falling short. Consumer disengagement means customers in the energy market overpay for standard variable tariffs by a staggering £1.4 billion a year.⁴ We've found that this loyalty penalty costs consumers up to £987 a year across six essential markets.⁵ It is often paid by those who can least afford it - people on the worst value energy tariffs, for example, are more likely to be on lower incomes or pensioners.⁶

Personalised pricing could make things worse for vulnerable consumers. Prices that were based on people's likelihood to switch could see prices for low income consumers rise higher. More concerning still, low income consumers appear worst placed to manage their online presence - only 25% of low income consumers know that prices might fluctuate after repeated searches.⁷

Consumers as a whole would be profoundly unhappy about this. 85% of people felt uncomfortable that personalised pricing could impact worse on vulnerable consumers.⁸

But it's not happening yet. Our research found that personalised pricing isn't currently widespread within essential markets. This is because:

- **Firms need data they don't have.** Many essential service providers do not yet have the ability to collect, store and analyse big data on the scale necessary for personalised pricing.
- **The return on investment is too low.** Personalised pricing requires investment in new IT systems & algorithms. Since consumers tend not to like the idea of personalised pricing, firms aren't yet taking the risk on investing.

Our research found that the potential for personalised pricing varies between markets:

- **In the postal and water sectors, it's unlikely that personalised pricing would emerge under current price protections.** Price caps mean that it's relatively hard for providers to price above cost, or to segment between users. This might change in coming years. The water sector might see the introduction of competition and an associated loosening of prices, and the online accounts for parcel delivery will make it easier to segment postal users.
- **In the energy and telecoms markets, personalised pricing looks more likely.** The pricing of energy and telecoms is fairly flexible, with an enormous range of tariffs on offer in both markets. These markets also have better access to consumer data, including personal data and usage data, providing firms with a fuller picture of their behaviour.

Consumers know that personalised pricing is more likely in some markets than others too. 55% of consumers anticipate the possibility of personalised pricing in mobile and broadband services. Whereas only 32% of consumers think it would be possible for personalised pricing to emerge in the water and postal sectors.

⁴ Competition and Markets Authority, [Energy Market Investigation](#), January 2016.

⁵ Citizens Advice, [The Cost of Loyalty](#), February 2018.

⁶ Ofgem, [Energy spend as a percentage of total household expenditure](#), October 2017.

⁷ A low income is categorised as less than £14,000 per annum.

⁸ Citizens Advice and ComRes polling, July 2018.

There are some constraints on personalised pricing. Existing legislation and regulations place limits on the forms that undisclosed personalised pricing might take. These operate in three main ways:

1. By preventing price discrimination based on identity,
2. By limiting access to consumer data, and
3. By providing transparency about pricing practices.

The efficacy of these constraints however, is only as good as the power to enforce them. If it's not clear that personalised pricing is happening, it's very hard to hold providers to account for a practice which is likely to be illegal. In this instance, it's vital that regulators - and particularly essential service regulators, continue to monitor the emergence of personalised pricing.

For the most part, truly personalised pricing lies in the future. But the challenges it presents should be tackled now. Current protections for consumers could also serve as important safeguards in the future:

- **Current price protections are vital** - but these must be kept up to date, to ensure those who are least able to manage don't get left behind.
- **Regulators need to keep up with technological changes** - by maintaining oversight about how data is used to inform pricing strategies and monitoring the cost of essential services for different consumer groups.
- **More needs to be done to ensure that technological developments - such as automated switching services - are used to benefit *all* consumers**, not only those who already shop around.

Introduction

By the year 2020, 1.7 megabytes of new information will be created every second for every human being on the planet.⁹ The exponential growth of so-called 'big data' is already having huge effects for consumers - and the markets they interact with. Our experience online is tailored to our interests, where we shop, our social media profile and it is looking increasingly likely that the prices we pay will be tailored to us too.

What is personalised pricing?

This transformation in how prices are set has come to be known as 'personalised pricing'. Personalised pricing is a sophisticated form of price discrimination - the practice of charging different consumers different prices for the same goods or services based on what they are willing to pay. Personalised pricing differs from traditional price discrimination due to its granularity: rather than try and segment consumers into different groups, the idea behind personalised pricing is to try and set a price for each individual according to what they are willing to pay. A huge range of data about us could, in principle, be used to set this price, from demographics (e.g. gender or race) or behaviour (e.g. web-browsing history).

We've already seen a number of different instances of personalised pricing for shoes, holiday bookings or newspaper subscriptions. But the presence of this pricing practice in essential markets remains largely unexplored.

The scope of our research

We wanted to learn more about personalised pricing - but in particular we wanted to focus on certain essential markets: energy, water, telecoms and post. We chose these markets because they are important for a range of consumers. Postal services remain highly important for older and more rural consumers.¹⁰ Energy, telecoms and water are so essential to modern life that, when prices rise or problems emerge, consumers are often unable to reduce or change their usage. This is a particular challenge for low-income households - the poorest households spend 9.7% of their annual expenditure on energy alone.¹¹

To answer our questions, we commissioned Frontier Economics to look at each of these four markets to review:

1. The conditions necessary for personalised pricing
2. The potential for its emergence in certain essential markets
3. The likely impact on consumers in each market

This report

This report sets out our reflections on the research conducted by Frontier Economics and discusses wider questions surrounding personalised pricing. Here, we aim to set out what personalised pricing might mean for consumers in practical terms.

⁹ AnalyticsWeek.com, [Big Data Facts](#), March 2017.

¹⁰ The scope of our research on the postal sector was limited to the notion of consumers as 'senders of mail', rather than considering the cost of delivery to consumers. For an account of this, see Geradin, Damien, [Price Discrimination in the Postal Sector and Competition Law](#), July 2010.

¹¹ Office for National Statistics Data, [Family spending in the UK: financial year ending March 2016](#).

We have broken this issue down into seven parts, which consider:

1. Personalised pricing: our key findings

This section sets out the key findings from Frontier Economics' review of personalised pricing. Subsequent sections build on these findings by introducing our own reflections.

2. How consumer data will drive personalised pricing

This section sets out how firms use data to build a more sophisticated picture of consumer behaviour and could use it to set more personalised prices.

3. The potential benefits of personalised pricing

Economic theory doesn't predict whether personalised pricing is good or bad for consumers: it is highly dependent on market specifics. This section sets out the way that personalised pricing could lower prices for some consumers and enable firms in industries with slim margins to stay in business.

4. The downsides of personalised pricing

Personalised pricing can lead to higher prices and excessive profits for companies, particularly in situations where there are few competitors or high barriers to entry. This section argues that essential markets already fail consumers on multiple fronts, in ways that could be exacerbated by personalised pricing.

5. The wider impacts of personalised pricing

Personalised pricing could affect the structure of essential markets. This section considers the potential impacts on innovation & competition.

Essential markets face big challenges, such as extending reliable broadband nationwide, developing more energy efficient services and addressing unfairness in pricing structures. There's a risk that if market failures aren't addressed, personalised pricing could compound these problems - allowing firms to target consumer behaviour in ways that might be detrimental for consumers in the longer term.

6. What might personalised pricing mean for vulnerable consumers?

Personalised pricing in essential markets has both risks and opportunities for consumers. Importantly, however, consumers likely to benefit from this pricing strategy would be those who already tend to be engaged with these markets. By contrast, consumers who have typically shown low levels of engagement, often the elderly or those on low income, might be treated as increasingly price insensitive - and encounter higher prices.

7. The constraints on personalised pricing

There are existing pieces of legislation and regulation which might limit the detrimental effects of personalised pricing, in particular by reducing its capacity to 'discriminate' against particular groups. It's unclear however *how* this regulation should be implemented, when the evidence of personalised pricing remains murky at best.

Recommendations: how to shape personalised pricing in essential markets

While personalised pricing has not emerged in essential markets yet, there's reason to think it's round the corner. This section considers what protections consumers need and how regulators can enable all consumers to benefit from technological developments.

1. Personalised pricing: our key findings

Our research found that personalised pricing is not currently widespread in essential markets but this could quickly change. This is because:

- **Firms need data they don't have.** Many essential service providers do not yet have the ability to collect, store and effectively analyse big data on the scale necessary for personalised pricing.
- **The return on investment is too low.** Personalised pricing requires investment in new IT systems & algorithms. Because personalised pricing is not trusted by consumers, firms aren't yet taking the risk on investing.

These factors look set to change. The increasing availability of consumer data, improved storage and opportunities for identifying correlations in this data, as well as the linking of 'smart' household products, means that essential service providers are likely to learn more about their clients, their habits and their financial capabilities than ever before at lower cost.

Some of the tools to address the worst effects of personalised pricing are already in place. In essential markets some prices have caps - such as the cost of landlines, postage or the upcoming energy price cap for standard variable tariffs - whereas others are free to fluctuate according to the market. It is these existing price protections in essential markets which are likely to act as the most effective constraint on personalised pricing.

In what market conditions can personalised pricing emerge?

Personalised pricing looks increasingly likely, but it only happens if certain conditions are met. For this pricing strategy to become widespread, two main things are important:

- **Providers must be able to charge more to consumers for the products they sell than the cost of making those products** (often this means they are in a strong or dominant position within a market). After all, if there are lots of providers selling a product cheaper than the price a provider predicts they're willing to pay, many customers will just switch away.
- **Providers must be able to use data to segment consumers into smaller groups** associated with common behaviours or characteristics. This information can then be used to work out who is willing to pay more and who will only buy at bargain prices.¹²

These conditions mean it's unlikely that personalised pricing would emerge in the post and water sectors, because:

- **These markets are at least partially price controlled.** In post, there is a universal service obligation - which means that a single price will send a letter anywhere in the UK. More specifically, the price of second class and large parcels

¹² The third factor necessary for personalised pricing to emerge is the 'inability of consumers to instantly resell the product'. This condition is highly unlikely to emerge in the essential market we are discussing here so we have largely excluded it from this account. To read more about this, see our accompanying research.

are controlled. Water companies have all their domestic prices set by their regulator Ofwat. The inflexibility of these prices means it would be hard for firms to introduce a sophisticated and variable approach to pricing its products.

- **There is limited access to consumer data.** Unlike energy and telecoms providers, only 50% of homes have a water meter.¹³ This shortage of information on usage patterns and the inability to switch provider means that the capacity for water companies to introduce a greater degree of price discrimination is limited. The postal sector usually lacks access to consumer data. At present the very act of purchasing a stamp and posting a letter is blind to which consumer does it, as the price of stamps remains regulated.

Personalised pricing could still emerge if market rules change. Specifically:

- In the postal sector, Royal Mail is allowing consumers to set up accounts online. This could open the door to using consumer data to personalise pricing - but controls on prices would still set a limit on this.
- The water sector might see the introduction of residential competition. Policy discussions about the introduction of competition in residential water provision have not developed significantly since 2016, but may still be pursued in future. The introduction of competition would be likely to be associated with the dismantling of current pricing controls - and would therefore open the door for more sophisticated price discrimination based on data analysis.

Personalised pricing is significantly more likely in the energy and telecoms markets

There are two key factors which create these conditions:

1. The increasing quantity of and capacity for data analysis

There are large and growing amounts of data on consumer usage habits. The rollout of smart meters will significantly change the amount of information held by providers in the energy sector. Our research found that the extent to which this will create the conditions for personalised pricing is dependent on how regularly consumers choose to share their data. Smart meters will give consumers the option to share data monthly, daily or at thirty minute intervals, as service providers increasingly offer apps or other services that access smart meter data through a Consumer Access Device (CAD) the granularity of data available to them will increase to near real-time data

Telecoms companies hold huge amounts of usage data which can be compared against consumers' actual contracts - this enables them to have a much richer account than energy companies have traditionally had access to. Even the basic functions of a phone can provide a rich picture of people's regular habits and consumption activities. These firms are able to ask crucial questions about their customers - to what extent do customers use their current packages? Are customers regularly underusing their data allowance or overusing it? What products do customers use in combination?¹⁴

2. Firms in these industries can set prices above the cost of production

Both telecoms and energy companies have a large range of tariffs available, with different charging structures built into them. In the energy industry, there are usually 200 different

¹³ <https://www.water.org.uk/consumers/metering>

¹⁴ Subramanya, S., [Analysis of mobile phone call data to determine user characteristics and to enhance user experience](#), International Journal of Computer Applications, April 2012.

tariffs available to choose between at any given time - both standalone, for electricity and gas separately, and bundled, bringing the two sources together.¹⁵ This tariff diversity suggests that there is room for manoeuvre in setting prices above the cost of production. This is of course, likely to be reduced somewhat by the newly introduced price cap on standard variable tariffs, which could protect some disengaged consumers who might be more vulnerable from experiencing such costs.¹⁶

The telecoms industry is also characterised by huge diversity in its pricing strategies. The only sector specific limitation on telecoms pricing strategies is Ofcom's monitoring of standalone fixed line services which led to the introduction of BT's voluntary commitment in October 2017.¹⁷

Ultimately, in both these markets, it is the relative flexibility that providers have to set prices that creates the conditions in which personalised pricing could emerge.

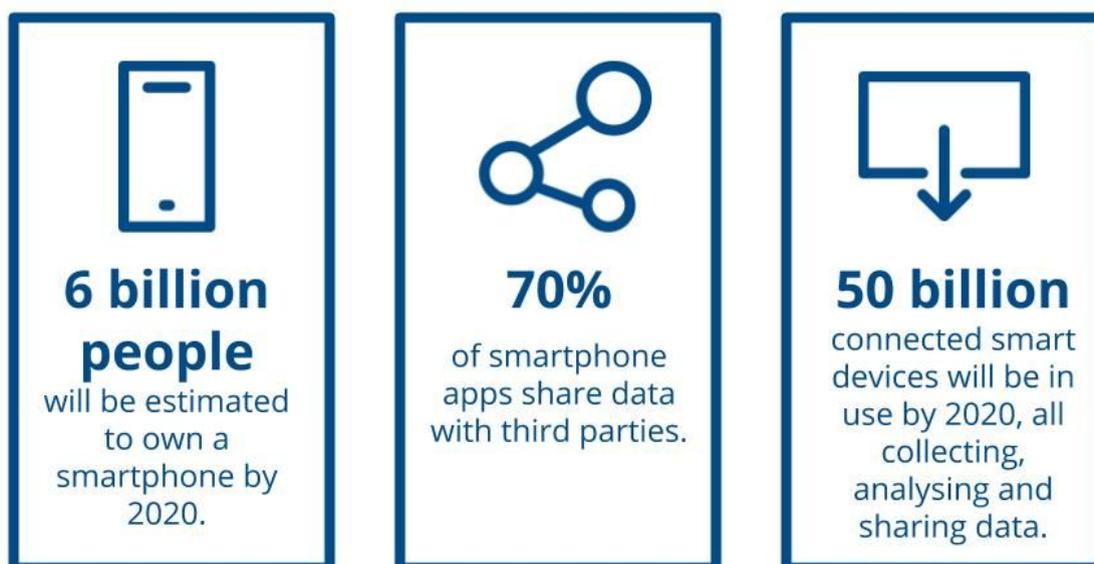
¹⁵ Citizens Advice energylinx data (unpublished), April 2018.

¹⁶ This is likely to be reduced somewhat by the newly introduced price cap on standard variable tariffs. For more information on our perspectives of the likely effect of the energy price cap, see Citizens Advice's [Energy Consultation Responses](#).

¹⁷ Ofcom, [Review of the market for standalone landline services](#), October 2017.

2. How consumer data will drive personalised pricing

Personalised pricing looks increasingly possible because of the growth in the availability of consumer data. This section elaborates on some of the changes in data availability across essential markets, and seeks to explain some of the technical developments through which personalised pricing can emerge. This transformation in the availability of data is a global phenomenon occurring across a huge range of markets.



Essential service providers in the UK are in the midst of massive changes in the accessibility of consumer data. This will enable them to know more about the consumers using their products than ever before. This growth in data availability is driven by three key factors:

- **Changes in purchasing habits.** More people than ever purchase their essential goods and services online. In 2018, **77%** of people in Great Britain used the internet to find information about goods and services in the last three months, up from 59% in 2008. More than three quarters of people made at least one online purchase in the last 12 months.¹⁸
- **Increasing information available through browsing history.** The Information Commissioner's Office found that UK websites placed an average of **44 cookies** on a first visit, the highest of any country surveyed.¹⁹ **86%** were persistent cookies

¹⁸ ONS, [Shopping online, 2008 to 2016](#). Base: Adults (aged 16+) in Great Britain

¹⁹ A cookie is a small text file created by a website stored in the user's computer either temporarily for that session only or permanently. Cookies enable websites to recognize and keep track of your preferences. Definition from [PC Mag](#) Encyclopaedia.

which remain on a person's device after use, whilst 14% were removed after a person's browsing session had ended.²⁰

- **The development of connected smart devices.** By 2020, there will be **53 million energy smart meters** rolled out in homes across the country. These have the capacity to generate as much as **400 megabytes** of data a year, which means UK energy providers could collect as much as **21.2 billion megabytes of additional data each year.**²¹

More sophisticated mechanisms for storing and analysing data mean that a range of data points can then be joined up. By linking unique identifiers, such as date of birth, IP addresses or full names, providers can develop sophisticated consumer profiles. These profiles would include basic personal information such as gender, date of birth, address, but could extend much wider - to consumers' shopping preferences, social networks, digital devices, and preferred holiday destination.

When integrated, this data can provide a sophisticated understanding of consumers' habits and usual behaviours. We know that consumer behaviour tends to fall into patterns associated with objective indicators. For example, an Ipsos Mori poll on basic digital skills found that while 85% of consumers had sufficient digital skills to purchase goods or services online, this fell to 76% amongst the lowest income bands and to 57% amongst older people.²² Both age and socio-economic status are also associated with consumers tending to pay over the odds for their energy, mobile phone and other essential services. It's perfectly plausible to imagine this additional data being used by providers to even more specifically identify which consumers were unlikely to scrutinise their energy bills.

Complex algorithms are an essential part of this process. Algorithms speed up the process of linking consumer data, but also ensure that the prices advertised online are able to fluctuate, depending on a range of different factors.

The most common use of algorithm-based pricing at the moment is **dynamic pricing**. This is a form of price discrimination in which algorithms automatically adjust prices or discount offers, typically to respond to changes in competitors' prices, but also on the basis of the relative levels of supply and demand (e.g. surge pricing). It is most commonly associated with the airline industry, and with firms such as Uber which operate 'surge' pricing, dependent on the availability of taxis in relation to customers.²³

We haven't found indications of widespread dynamic pricing in essential markets, but the risk that algorithms could be used to 'fix' prices are suggested in the case study below.

Case study

Two companies that sold frames and posters online put in place an agreement not to undercut each other's prices in certain circumstances, and on certain products on Amazon's UK site. In order to ensure this was the case, both sellers used automated repricing software to monitor and adjust their prices. The two companies kept in contact

²⁰ Information Commissioner's Office, [Article 29 Cookie Sweep Results](#), 2015.

²¹ SmartGridAwareness.com, ['Smart meters generate a 'gold mine of data' for Utilities'](#), December 2015.

²² Ipsos Mori, [Basic Digital Skills](#), 2015.

²³ OECD, [Algorithms and Collusion](#), June 2017.

to make sure the pricing arrangement was working and to deal with issues regarding the operation of the repricing software.

The CMA found this to be a breach of competition law. It fined the firms and disqualified the managing directors from taking up director positions for the next five years. This form of price fixing only departs in a fairly limited way from older forms of price fixing. But, as the CMA acknowledged; *'A further challenge remains for regulators to better understand whether, and if so in which circumstances, algorithms (in particular through so-called 'self-learning') could result in potential harm to competition or consumers where there is no such discrete, explicit agreement or where potential harms are more difficult to detect.*²⁴

²⁴ OECD, [Algorithms and Collusion](#), June 2017.

3. The potential benefits of personalised pricing in essential markets

Increasing data sharing and personalised pricing can be good for consumers. As personalised pricing is not easily identifiable in essential services markets, we've used a range of examples here to think about its possible benefits:

- **It might lead to lower prices for some consumers.** Where suppliers know the prices their competitors charge and there is a high likelihood that their customers shop around, an increase in data allows them to undercut their competitors and offer the lowest feasible price to particular consumers.

In the energy market for example, smart meters offer consumers the choice of how regularly to share their usage data. If consumers give suppliers permission, suppliers and third parties could use the data to provide personalised offers - according to the consumers usual usage patterns. These offers are likely to be more targeted, potentially enabling consumers to receive better, lower cost deals.

- **Consumers may get offers which better suit their needs.** Increased understanding of the combination of products, especially telecommunications services, which are used by consumers can enable providers to target the most appropriate deal to consumers.

More sophisticated use of 'bundles' might be one example of this. Bundling, the practice of providing combined offers to consumers for several different products at a lower overall cost, has been widespread in the telecoms market for some time. In 2016, 75% of UK households bought a bundled communication service. Ofcom found these services 27% cheaper than the average price for the same services on their own.²⁵ With greater access to consumer data, communications providers might be able to develop more appropriate bundled products which specifically meet the usage needs of different consumers.

- **It enables expensive products and services to be made available at a lower cost** to those who plan ahead. Some consumer services are immensely costly to provide, and if all consumers paid an equal price, the service would remain out of reach for those on low incomes. Developments in the use of dynamic pricing can help to address this problem.

Pricing according to willingness to pay often operates in such a way for airlines. The pricing structure for budget airlines means that consumers who plan ahead can secure very low cost airline tickets. This means that those consumers who might ordinarily be excluded from the market at a higher price are able to fly. By contrast, those who purchase tickets later tend to pay much higher prices, as a consequence of reduced price sensitivity. This variable pricing strategy makes flying available to a

²⁵ Ofcom, [Pricing trends for communications services in the UK](#), March 2017.

much larger range of consumers than a mid-level standardised price across all tickets.

- **It could give consumers access to greater choice.** Personalised pricing can support consumers to have a greater choice and variety. This is because it can allow even loss making companies to turn a small profit by effectively assessing willingness to pay.

The Wall Street Journal, for example, does not have a total paywall. Instead, it offers different subscription fees depending on a user's web history. For those it considers unlikely to pay a regular fee, it offers an 'introductory offer' of just £3 a month. This use of price discrimination allows the newspaper to continue to meet its costs while distributing the price consumers pay according to their predicted interest in its content.

- **It might enable suppliers to better manage demand.** So that some very popular services do not become overburdened, personalised pricing can be used to manage demand.

Energy networks currently struggle to meet the demand of 'peak' hours of energy usage. Time of use tariffs seek to reflect the time-varying nature of electricity costs more accurately than current tariffs. These tariffs would charge higher prices at times of high levels of demand, whilst offering lower tariffs to those who used their energy at off peak hours. The tariffs seek to encourage consumers to shift their energy usage to lower-priced hours. This might lower energy bills overall, whilst also providing a potential reduction in power system costs.²⁶ This is more cost reflective pricing, but it also marks a way forward for price discrimination which seeks to manage demand. Time of use tariffs do not reflect direct personalisation of prices to each individual, but instead break consumers down into groups of thousands of customers. We can see how this works, if we look at a less essential market - a 'peer-to-peer' taxi company such as Uber. We can see that surge prices are not totally personalised, but effect those consumers who use its service at a given time. Uber argues that without surge prices, customers wait longer and the rate of fulfilled rider requests plummets - suggesting that surge pricing actually intervenes in the level of demand for a service.²⁷

²⁶ Whilst theoretically interesting, time of use tariffs do carry certain risks, especially for those consumers who would struggle to shift their demand, due to working hours or dependent family members. Citizens Advice has conducted significant research into this issue. For more information, see The Brattle Group for Citizens Advice, [The Value of Time of Use Tariffs in Great Britain](#), July 2017.

²⁷ Although as we'll go on to show - it's important not to overstress equivalents such as Uber. Demand for essential services - such as heating and water - are not similar to a taxi ride, for most consumers there is no immediate alternative on offer. For more information, see The Economist, ['Price discrimination land'](#), February 2016.

4. The downsides of personalised pricing in essential markets

The effective use of consumer data to set prices can have real benefits, enabling lower costs for some consumers and smoothing demand across services. But it's one thing to have personalised pricing through 'disruptive' apps which lower the cost of taxi journeys or a pair of shoes. The effects of personalised pricing look quite different when it comes to essential service markets, where patterns of consumer behaviour are very different.

Consumers tend to be less price sensitive when it comes to these services. Behavioural insights attributes this to a number of reasons:

- Consumers tend to stick to their existing provider, and find it a hassle to switch
- People tend to find these markets complex - with too much choice
- Consumers tend to be overconfident about their ability to pay.²⁸

We know that, at present, markets take advantage of these patterns of consumer behaviour, leaving people paying over the odds for the goods that they receive. Personalised pricing risks exacerbating these problems as it might have further negative effects on people's behavioural biases.

Personalised pricing might increase the loyalty penalty

As the chart below shows, consumers in essential markets often find themselves experiencing a penalty for failing to switch between providers. This reluctance to switch tends to be referred to as 'consumer inertia', also known as as the status quo bias.

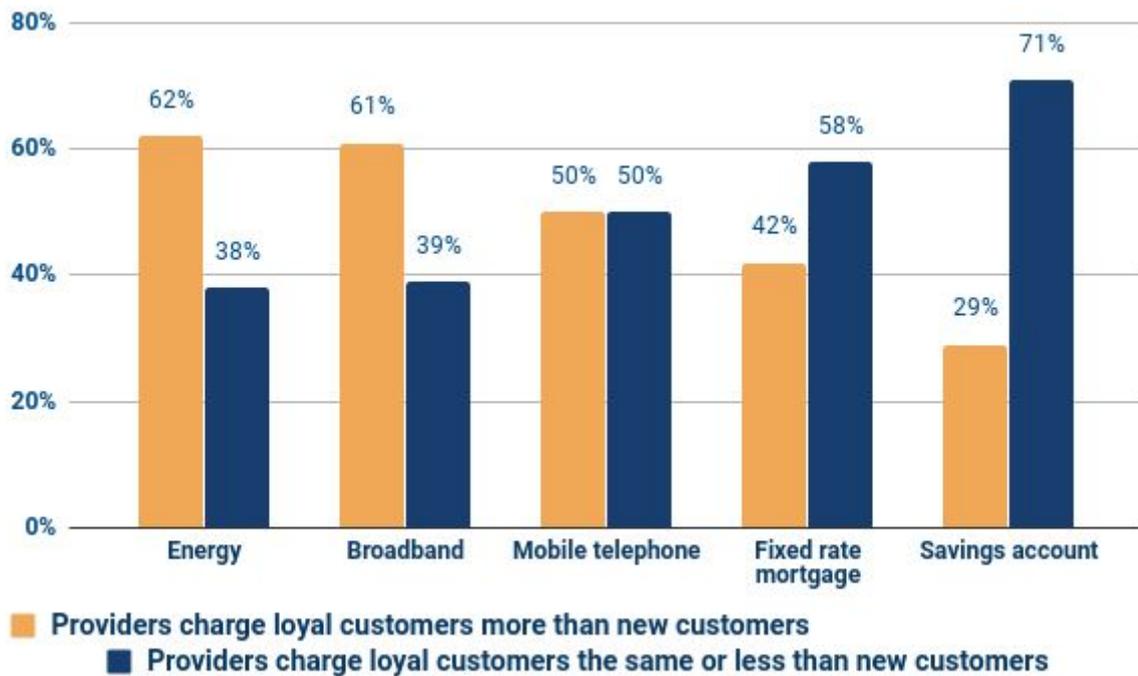
Status quo bias amongst essential services providers is particularly notable since, unlike other commodities, these services tend to 'roll over'. When it comes to energy, most people 'inherit' an energy provider when they move into a home. This is different from other markets where - if you don't seek out the product - you might be forced to go without. Energy customers are therefore particularly likely to remain with their current provider, since this is unlikely to lead to the service ending or running out.

It's by identifying - and taking advantage of - consumer inertia that firms can charge a 'loyalty penalty'. This is the increased cost consumers pay for not shopping around, for the same good or service. Our research earlier this year found that, cumulatively, **people could be overpaying by as much as £987 - more than 4 months' worth of food for the average household.** And it's often vulnerable consumers who pay the most.²⁹

²⁸ See Behavioural Insights Team for Citizens Advice, [Applying Behavioural Insights to Regulated Markets](#), May 2016.

²⁹ Citizens Advice, [The Cost of Loyalty](#), February 2018.

Figure 1: Awareness of the loyalty penalty across essential services



Source: Citizens Advice analysis of Populus data³⁰

Personalised pricing could make it easier to target loyal consumers. Large-scale data analysis would allow providers to identify the consumers who are most likely to switch between providers and those who are not. Currently, mobile phone and broadband providers commonly offer bundled ‘retention offers’ to those clients who are likely to switch provider. For example, if you call your mobile phone provider to let them know you are cancelling your contract, it’s likely they will give you a better deal than you might be able to find advertised elsewhere.³¹

If mobile phone or broadband companies could access their customers’ web browsing data - which might indicate the likelihood of switching - this pricing strategy would become increasingly possible. Offers might reach consumers through email and advertising, as well as the over the phone methods traditionally used to haggle with providers. The increasing use of retention offers, however, would benefit only a section of the market - those who regularly switch their phone or broadband providers. It would penalise loyal or disengaged consumers over the long term.

Personalised pricing could increase inertia. As data is used to identify consumer preferences, in addition to increasing personalised offers, it is likely that more products will be ‘bundled’ - particularly in the telecoms sector. This process is expected to increase the complexity of the telecoms sector - which is already a problem for consumers. Over a third (35%) of consumers making a purchase say it’s too hard to shop around in all

³⁰ Question: ‘For the following services, do you think long-standing customers are likely to pay more or less than newer customers?’ Bases vary by market and exclude those who answered ‘Don’t know’. Populus Survey Data, January and June 2017.

³¹ Moneysavingexpert.com, ‘[Mobile Phone Hagglng](#)’, March 2018.

essential markets.³² This complexity dissuades consumers from finding the best value product - and often leaves them sticking with their current provider.

Personalised pricing looks set to exacerbate this problem. The bundling of offers for consumers - while often providing a combined discount - makes it harder for people to compare prices across goods and services to ascertain whether they are getting a good deal. Bundled products can cause issues for the term-lengths of contracts. A mobile phone contract, for example, which ends six month earlier than the broadband contract - leaving consumers paying rolling over some contracts even after they are complete.³³ And, where consumers prefer a single service, breaking up 'bundled' products can be a hassle.³⁴ This increasing complexity might cause consumers to feel both disengaged and disempowered. As it is, we often speak with people who would prefer to choose between simple product offerings:

*"I found the task tedious because there are so many options to choose from, not just broadband but everything else is bundled in, calls etc."*³⁵

Consumer making a decision about home broadband

Personalised pricing makes it easier for essential service providers to target overconfident consumers.

The insight into consumer behaviour provided by large datasets doesn't only enable providers to identify consumer inertia, it could allow providers to target other behavioural biases too.

This knowledge of consumer behaviour could see firms targeting those with a tendency towards financial overconfidence with offers which they might, in the longer term, struggle to maintain. We already see nearly 40,000 consumers coming to Citizens Advice with problems with their mobile phone contracts. In many instances, these people take out the contracts with high confidence that they will be able to meet the cost of ongoing monthly payments. Unfortunately, however, overconfidence can leave consumers unlikely to account for changes in their income or unexpected financial shocks, and they may then find it difficult to meet the cost of such arrangements.

Overconfidence is more common amongst some consumers than others. Previous research has shown that consumer overconfidence is most common amongst those with the least knowledge.³⁶ Researchers have found that roughly 30% of consumers overestimate their credit score, with only 4% underestimating.³⁷ Personalised pricing

³² Citizens Advice, [The Cost of Loyalty](#), February 2018.

³³ This was a particular issue highlighted by OfCom, [Helping consumers to engage in communications markets](#), September 2017.

³⁴ Research suggests that the elderly and those on lower incomes are more likely to be using a standalone landline offer. Ofcom, [Consultation Review of the market for standalone landline telephone services](#), 2017.

³⁵ Citizens Advice, [Against the Clock](#), November 2016.

³⁶ Lichtenstein, S., & Fischhoff, B. (1977). 'Do those who know more also know more about how much they know? Organizational Behavior and Human Performance', 20(2), 159-183.

³⁷ Perry, V. G. (2008). [Is Ignorance Bliss? Consumer Accuracy in Judgments about Credit Ratings](#), The Journal of Consumer Affairs, 42(2), 189-205.

strategies could take advantage of this - using access to web history to give providers an indication of the characteristics which might be associated with overconfidence.

Subscription traps are a common way in which consumer overconfidence about their ability to pay is exploited - and then exacerbated through a reliance on consumer inertia.

Subscription traps - targeting consumer overconfidence and inertia simultaneously

In previous research, Citizens Advice has explored the issues surrounding subscription traps. These are situations where a consumer unintentionally enters into a subscription through the advertising of a “free trial” or reduced price offer. But if the consumer doesn’t cancel the trial within a set amount of time they automatically get transferred onto a costly subscription payment plan.

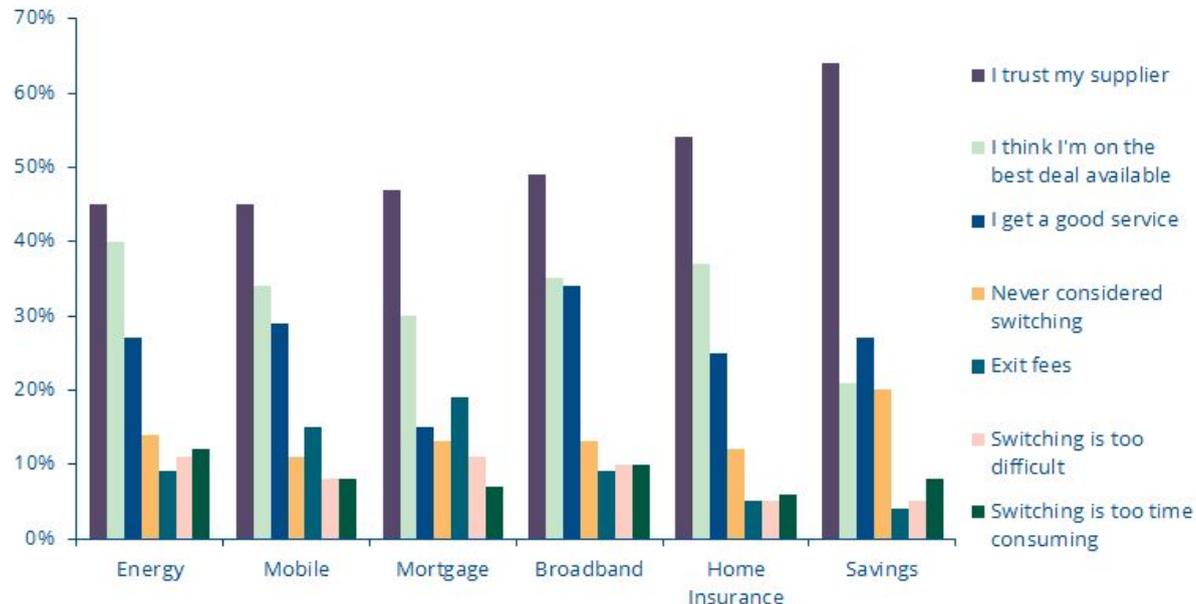
Subscription traps exploit consumer inertia by making it very difficult to withdraw from their terms. This is particularly damaging, since subscription traps often rely on Continuous Payment Authorities - which are harder to cancel than usual direct debits. But they might also target consumer overconfidence about their ability to pay. Using additional data on consumers could enable unscrupulous firms to target those who are most likely to feel confident about the costs.

Subscription traps pose a greater threat than ever with the increasing availability of consumer data. This data could indicate which consumers are likely to be both overconfident and inactive when it comes to their subscriptions.

Personalised pricing could further weaken consumer trust.

Trust plays a complex role in regulated markets - the generalised level of trust in regulated markets is often low, but consumers do tend to trust their current suppliers more than others (see figure 3).³⁸ Some groups of consumers are more concerned with trusting their provider than others - ironically, it is often those who trust their supplier most who are likely to be paying the loyalty penalty.³⁹

Figure 3. Trust is the most popular reason people give for staying in an essential service contract



Source: Citizens Advice analysis of Populus data.⁴⁰

Personalised pricing is not widely understood, and few consumers have an indication of the extent of information that is collected online.⁴¹ Prior research into consumer trust has found that consumers tend to be less trustful of online retailing where prices fluctuate,⁴² and that even when price fluctuation saves them money they still tend to be distrustful of the retailer.⁴³ As consumers become aware of personalised pricing in essential markets, the risk is that the general level of trust in markets will collapse. This lack of trust, rather than encouraging switching to an alternate provider, may leave consumers reluctant to take risks with alternate providers, and less likely to receive the best offers.

The Office of Fair Trading's 2013 report into personalised pricing suggested that concern over the loss of consumer trust was one of the key barriers providers face to introducing

³⁸ Only one in three consumers in the mobile phone market believe they are on the best deal available, suggesting a low level of trust in the market overall.

³⁹ Citizens Advice, [The Cost of Loyalty](#), February 2018.

⁴⁰ Question: 'You said you have been in your contract for a year or more. Why have you stayed with each of the following essential service contracts?' Respondents could select more than one option. Base sizes vary by market.

⁴¹ Ipsos Mori, [Basic Digital Skills](#), 2015.

⁴² Pavlou, Paul A., Huigang Liang, and Yajiong Xue (2007). 'Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective.' *Mis Quarterly* 31.1: 105-136.

⁴³ Garbarino, Ellen, and Olivia F. Lee (2003). 'Dynamic pricing in internet retail: effects on consumer trust.' *Psychology & Marketing* 20.6: 495-513.

this pricing strategy.⁴⁴ But - while regulators might be deeply concerned about consumer trust - there are limited incentives for individual providers to be bothered about the total level of trust in online markets. In this instance, the profitability of sophisticated pricing strategies may outweigh concerns about the generalised level of trust.

Indeed, the experience of recent data breaches suggests that some of the most data rich websites in the world, such as Facebook, can - and have - been taking risky decisions when it comes to consumer data. These risks are taken in spite of the potential threats to consumer trust in the longer term. Our research suggests that a concern about consumer trust alone therefore, is not sufficient to prevent the emergence of personalised pricing, especially where the operation of personalised pricing might not be transparent to the consumer or regulators.

⁴⁴ Office of Fair Trading, [The Economics of Personalised Pricing](#), 2013.

5. The wider impacts of personalised pricing

Ultimately, personalised pricing could bring both positive and negative effects for consumers - and it's difficult to assess which will outweigh the other before it happens (though, as we argue below, it is possible to mitigate against the downsides). However, it's also possible that it will have deeper effects on market structure, which in turn will affect consumer outcomes.

It could impact innovation. Investment in increasingly sophisticated pricing strategies might maximise revenue, but it won't necessarily maximise what consumers actually want - better quality, low cost services.

In addition to the extensive consumer problems we identified earlier, there are major challenges facing essential markets. Energy providers need to adapt to the challenges of climate change. The telecommunications industry needs to ensure that they are able to meet the demand for 5G services and superfast broadband - including in 'internet black spots' that are currently underserved. We need providers in essential markets to address these challenges while developing more efficient ways for services to reach consumers at the lowest cost. Rather than investing in segmenting consumers into ever smaller groups based on willingness to pay.

It could impact competition. At present, competitive essential markets rely on the risk that new entrants might 'disrupt' existing market practices to control prices. But personalised pricing is likely to rely on extensive use of consumer data sets. Without access to the enormous data sets which existing providers hold, new, more efficient providers could struggle to beat the personalised offers provided by existing providers, and be barred from entering the market as a result

Repricing software⁴⁵ - and the algorithms on which they rely - could be particularly damaging for competition where providers practice 'instant price matching'. These algorithms could reduce the incentive for other firms to undercut prices, since it could initiate a 'race to the bottom' as well as limit the ability of new firms to enter the market. Such strategies, especially if used by a firm with strong position in the market, could have negative consequences for competition.⁴⁶

The risk to competition posed by personalised pricing could be exacerbated by concentration of large amounts of consumer data within a relatively small number of digital platforms. Platforms such as Facebook, Google, and Amazon hold far more data on consumers than the standard energy provider and are able to provide a very rich account of who their users are. And the use of smart connected devices tends to rely on one of these three providers to link different consumer products. This concentration of data within a series of 'tech' firms could, if paired with a major energy provider, lead to a

⁴⁵ Repricing software uses algorithms to automatically adjust the prices of all items depending on a range of the market conditions, such as fluctuations in demand or competitors' prices.

⁴⁶ OECD, [Algorithms and Collusion](#), June 2017.

massive expansion in the providers' access to consumers, and subsequently push other providers out of the market.

There have been big improvements in levels of competition in the energy market since 2010, but if access to smart meter data is limited by the interaction of suppliers and smart home devices we might find that such improvements are reversed. The large stores of consumer data which are generated both by tech firms and by smart devices also raise the issue of data portability. How do we ensure consumers can continue to switch providers if their data is largely stored in a mode which is incompatible with other providers?⁴⁷

Finally, we must be wary of a negative feedback loop here. Personalised pricing could be bad for competition. And our research found that if competition is reduced, the risks posed by personalised pricing become much greater. Without downward pressure on prices in markets where consumers don't regularly switch providers, customers might find themselves losing out.

6. What might personalised pricing mean for vulnerable consumers?

This paper has sought to present a balanced view on the opportunities and risks of personalised pricing in essential markets. We remain cautious, however, about one aspect of personalised pricing - its effects for vulnerable consumers.

Crucially, the most hazardous effects of personalised pricing - arising from reduced competition and diminished consumer trust - could compound the difficulties vulnerable people face in engaging with consumer markets:

- **Diminished competition would push prices up.** Whilst increased prices across a market are bad for all consumers, those who have higher incomes are less likely to feel the effect of such costs on their living standards. By contrast, those with the least flexible budgets, generally people on low incomes, are forced to pay a larger proportion towards energy or basic communication services.
- **Decreased trust in markets would increase consumer disengagement.** Vulnerable consumers tend to have lower levels of trust in consumer markets, compared to wealthier people.⁴⁸ This attitude - which recognises that the odds are stacked against low income consumers - means that people have no incentive to engage, even where it might secure them a better deal.⁴⁹ Unfortunately, the

⁴⁷ The General Data Protection Regulation (GDPR) which comes into force in May 2018 introduces a right to data portability. Whether firms will remain bound by data portability rights, and whether consumers manage to push for these rights remains to be seen, especially due to the relatively small number of smart product providers currently in operation. Ofgem, [End-to-end switching arrangements: data protection impact assessment](#), September 2017.

⁴⁸ Those on the very lowest incomes tend to have the least trust in their energy suppliers on a range of issues, including value for money, bill accuracy, and openness and transparency. [Ipsos Mori research for Energy UK](#), 2014.

⁴⁹ Citizens Advice, [The domino effect: exposing the knock-on effects of consumer problems](#), March 2018

cumulative effect of such market disengagement doubly penalises low income consumers - creating a vicious circle.

7. The constraints on personalised pricing

Existing legislation and regulations place legal constraints on the forms that personalised pricing might take. These limits operate in three main ways:

1. By preventing price discrimination based on identity,
2. By limiting access to consumer data, and
3. By providing transparency about pricing practices.

The efficacy of these constraints however, is only as good as the power to enforce them. In this instance, it's vital that regulators - and particularly essential service regulators, continue to monitor the emergence of personalised pricing, and hold companies to account where it might negatively impact on consumers.

1. Protection from discrimination on the grounds of identity

Existing legislation should protect consumers from personalised pricing which can be directly linked to identity. This is enshrined in two places:

- **The Equality Act 2010** states that people are not allowed to discriminate against another person on the grounds of 'protected characteristics', such as: age, disability, race, religion, sex, or sexual orientation. The Equalities and Human Rights Commission, the regulatory body which oversees this act, states businesses must not directly or indirectly treat people worse because of protected characteristics, unless this can be objectively proven on grounds of cost.⁵⁰

The challenge posed by the the Equality Act is the need for legal challenge and strong evidence for the presence of personalised pricing. Thus far, it has been very difficult to prove that personalised pricing is taking place with suppliers insisting that what people consider to be personalised pricing tends to be sophisticated dynamic pricing. Another shortcoming of the Equality Act is it's failure to provide protections for those on low incomes - who might be left most exposed if the worst effects of personalised pricing were to emerge.

- **The Provision of Services Regulations 2009**⁵¹ restrict discrimination between customers in the EU based on their place of residence, unless this can be justified by additional costs incurred (e.g. due to distance travelled).

The status of the Provision of Service Regulations after Brexit is unclear. In addition, it's unlikely that these regulations protect the group of people who are at risk of experiencing the worst excesses of personalised pricing - those who are vulnerable, on a low income, or struggle to choose between essential service providers - factors which cannot be neatly reduced to geographical location.

⁵⁰ The UK Equality and Human Rights Commission, [Services, Public functions and Associations: Statutory Code of Practice](#), p.52-82.

⁵¹ [The Provision of Service Regulation 2009](#)

2. Control over the use of consumer data

Legislation also appears likely to provide a legal protection from the undisclosed personalised pricing.

- **The Consumer Rights Act 2015** regulates the terms of use of a website, and any privacy policy applying to users of a website. In the event of personalised pricing, data collection might be limited by rules which require “important contract terms, particularly those which may disadvantage consumers”, to be “clear, prominent and actively brought to consumers’ attention. It may not be sufficient only to include terms in a privacy policy.”⁵²
- **The Privacy and Electronic Communications Regulations 2003** give people the right to opt out of cookies. They require parties which set cookies on a user’s device to obtain informed consent to their use unless the cookies are essential for the supply of a service requested by the user, for example to add goods to a shopping basket.

The shortcoming of these regulations is that almost all websites use cookies - making it very difficult for consumers to avoid consenting to cookie use.⁵³

- **The General Data Privacy Regulation 2018⁵⁴ and Data Protection Act 2018⁵⁵** gives consumers greater control over how their personal data is used. This includes requiring that consumer consent to using their data is freely given, specific, informed and unambiguous.

Article 22 of GDPR gives people the ‘the right not to be subject to a decision based solely on automated processing, including profiling’.⁵⁶ This Article might give people the right either to opt out of the types of automated processing and data profiling associated with personalised pricing if they can prove that it ‘significantly affects’ them. This could mark a major development in the legal limits on personalised pricing.

At the moment - however - it’s unclear how such an opt out might work. In current browsing systems, the process of profiling consumers data does not necessarily occur after an opt in process, with cookies and personal data profiled before consumers have a chance to provide ‘informed consent’.

3. Transparency about pricing

- **The Consumer Protection from Unfair Trading Regulations 2008⁵⁷** prohibit unfair commercial practices which distort consumers’ transactional decisions, as well as a number of practices that are prohibited outright. A business may breach the CPRs by, for example, failing to tell consumers that information is being collected about them, and used commercially, where a privacy policy does not

⁵² Part 2: Unfair Contract Terms, [Consumer Rights Act, 2015](#)'.

⁵³ [The Privacy and Electronic Communications Regulations 2003](#).

⁵⁴ Information Commissioner’s office (2017) “[Guide to the General Data Protection Regulation \(GDPR\)](#)” and <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R0679>

⁵⁵ <http://www.legislation.gov.uk/ukpga/2018/12/contents/enacted>

⁵⁶ [Article 22](#), General Data Protection Regulation

⁵⁷ [Consumer Protection from Unfair Trading Regulations 2008](#)

accurately represent the information actually being collected, or where information is being used *covertly to personalise a price*.

- The **Advertising Standards Authority (ASA)** is the UK's regulator of advertising. It makes sure that ads across UK media adhere to the Advertising Codes, which include rules around the prevention of misleading advertising. This might reduce the capacity of providers to misrepresent personalised 'discounts' or 'best price' deals which might actually be more expensive, than offers to other consumers.

Underlying all of these regulations is the **Competition Act 1998** which gives wide powers of enforcement to the CMA and to the sector regulators. It is imperative that the CMA uses these powers to monitor the risks associated with personalised pricing, and challenge firms where consumers - especially those on the lowest incomes - might be at risk of losing out.⁵⁸

⁵⁸ Bourreau, B., de Streel, A., and Graef, I. (2017), *"Big Data and Competition Policy: Market power, personalised pricing and advertising"*

Recommendations: how to shape personalised pricing in essential markets

This paper has sought to identify how - if existing market failures are not addressed - personalised pricing could affect essential markets.

The problems we have articulated in this paper - whilst drawing from existing evidence within consumer markets - are still speculative. At the moment, personalised pricing is not widespread in essential markets, and in some contexts, such as the water and postal sectors, current regulations and market structures mean that it would be nearly impossible for it to emerge.

But this doesn't mean personalised pricing couldn't emerge in the future. If it does, it's vital that regulators, consumer groups and providers are fully aware of the implications for consumers. Crucially, we mustn't rely on the actions of 'engaged consumers' or 'responsible providers' to limit the detrimental effects. We need to maintain certain limits on price fluctuation, and take other proactive steps to ensure that consumers - particularly those on low incomes - are protected.

Consequently, we recommend that:

A. Regulators should use existing tools to manage the risks of personalised pricing

- 1. Current price protections are vitally important to protect low income consumers.** The controls on the cost of fixed line telephone contracts and second class stamps, and the upcoming cap on standard variable tariffs, are all measures which would protect those on low incomes from suffering at the sharp end of personalised pricing. Crucially, these controlled tariffs not only reduce cost, but also simplify the market.

These tariff controls must be kept under review. Firstly, to ensure that they continue to be set at the appropriate level for consumers. And secondly, to ensure that shifting conceptions of what is 'essential' is taken into account.

- 2. Regular monitoring to ensure vulnerable people are not overpaying for essential services.** Increased complexity in algorithmic price determination may make it difficult to understand the mechanisms by which prices are calculated. To mitigate against this, regulators should be consistent in assessing the cost of essential services to different groups of consumers to ensure that some groups are not paying over the odds for similar goods and services.

One means to strengthen and enforce such monitoring would be to integrate it into the scorecards proposed in the recent Consumer Green Paper published by the Department for Business, Energy and Industrial Strategy.⁵⁹

- 3. Increase transparency of pricing practices between firms and regulators.** The use of consumer data is already extensive. If and how this data is fed into pricing

⁵⁹ BEIS, Modernising consumer markets: Consumer Green Paper, April 2018

strategies remains largely opaque - we need regulators to be conscious of the risks that access to consumer data might pose to prices.

There should be a duty on the part of regulated firms to inform regulators where personalised pricing is in operation, as well as an obligation to be transparent with regulators about how personalised prices are calculated.

B. Technology is leveraged to protect the interests of consumers

4. Regulators should support new tools to make consumer engagement easier.

Third party switching devices can take much of the hassle out of finding and switching to a better deal. As well as price comparison websites, these include sites such as Cheap Energy Club which notifies consumers if there is a better deal available, or Flipper which is a paid-for automatic switching service. These tools reduce the effect of the so-called 'loyalty penalty' and would be a means for consumers to use technology to challenge the detrimental effects that the technology of personalised pricing might have.

If these tools are limited to those who are actively engaged in essential markets, it's likely that they would only entrench existing market problems. Instead, regulators should explore how this model could be applied across essential markets to support *all* consumers.

C. Consumer control over data is increased

5. Give consumers greater control over the collection, storage and use of their data. Giving consumer 'control' over data does not necessarily resolve problems - since it is often unclear how consumer data is used by providers, or buried deep in to terms and conditions. The GDPR does mark a substantial improvement in consumer protections over data regulation - particularly by allowing consumers to 'opt-out' of automated profiling. However, the process by which this can be implemented is not yet clear.

Despite this lack of transparency, we think consumers should be given legal control over their data. As this provision allows people to challenge instances where data is used against the customer's interests. This legal control should be accompanied by extra clarity. Regulators should consider how to give customers clear oversight about how their data is stored and used in setting prices, allowing consumers to withdraw consent to providers as and when they choose.⁶⁰

⁶⁰ See Citizens Advice, Fairness and Flexibility: Making Personal Data work for Everyone, July 2016.

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