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Estimating the benefits of interventions that affect consumer behaviour

William Lee

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Author

William Lee works in the Competition & Economics Division of the Financial Conduct Authority.

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1 Summary

In retail financial markets, given the complexity of products, a lack of complete and transparent information, and the presence of behavioural biases and cognitive limitations in our decision making, we as consumers may make decisions that are not in our best interests.[1, 2]

For example, we may purchase a financial product at a price higher than we might have secured had we been better informed about the product, or had better considered our long-term needs. In the words of Thaler & Sunstein (2008):

"*In many cases, individuals make pretty bad decisions – decisions that they would not have made if they had paid full attention and possessed complete information, unlimited cognitive abilities, and complete self-control.*"

Many of the problems observed in retail financial markets may be underpinned by such "suboptimal" behaviour. [3] Estimating the extent to which consumers' decisions diverge from their best interests, and how far regulatory intervention can address such problems, is a difficult task.[4] Regulators seek to do both to identify and reduce consumer harm in these markets.

For example, the Financial Conduct Authority (FCA), the UK's financial conduct regulator, seeks to address potential or actual harm to consumers in the markets it regulates (FCA, 2017a). The consumer benefits of regulatory intervention can be measured by how far an identified harm can be remedied or mitigated. Some of these benefits, such as the impact to consumers of favourable changes in price, may be relatively straightforward to measure, but others are more difficult to quantify.

This paper discusses how to estimate and assign monetary values to the benefits resulting from regulatory interventions aimed at addressing behavioural distortions and informational asymmetries:

- Chapter 2 sets out a framework for assessing the consumer benefits that might arise from regulatory intervention;
- Chapter 3 reviews three approaches for valuing consumer benefits: stated preference (what consumers say they want), revealed preference (what consumers choose in practice), and subjective well-being (what consumers say about their well-being after they have made their choices). These are the common approaches used for assessing consumers' willingness to pay (WTP) for products and services, and can be adapted to

[1] For a discussion on information asymmetry, behavioural distortions, and other market failures in financial markets, see Iscenko et al (2016).

[2] In this paper, terms such as 'optimal choice' and 'best interest' denote decisions that are consistent with the true preferences of consumers. The concept of true preference is further discussed in Chapter 2 of this paper.

[3] Suboptimal behaviour may be the result of firms intentionally exploiting biases or obscuring important information. However, this paper focuses on the role of consumer behaviour.

[4] This is especially challenging when what is in consumers' best interests is ambiguous: see Infante et al (2016).

consider whether consumers make optimal decisions, as well as the potential benefits arising from regulatory interventions.[5]

- Finally, Chapter 4 discusses which techniques to use when assessing the benefits of financial regulation under different circumstances, and suggests how this depends on the goal of the analysis, market and product characteristics, data availability, and proportionality.

All of the available techniques for assessing choice suffer from various implementation, data availability, and resource issues. Judgement is therefore required to determine which approach to adopt on a case-by-case basis. The table below offers an overview of how each approach may be used at different stages of policy making: problem identification and diagnosis, ex-ante remedy appraisal, and ex-post evaluation.

Table 1: Applications in policy making

	Identification & diagnosis of harm	Ex-ante remedy appraisal	Ex-post policy evaluation
Stated preference: Discrete Choice Modelling (DCM)	DCM may be used to identify whether behaviour is consistent with stated preferences. It is unclear whether stated preference reflects true preference any more reliably than actual behaviour (revealed preference), given the known issues associated with both.	DCM may be used to predict consumer behaviour when features of the product change, or under different choice environments. However, results are likely to suffer from a number of biases.	Observed outcomes (through revealed preference or SWB) are more reliable and should be preferred to stated preference techniques.
Revealed preference	Inconsistent consumer behaviour in comparable markets or natural experiments may signal the presence of potential distortions.	Field trials offer good prediction of consumer behaviour in alternative decision environments.[6] They can also be used to calibrate structural models to capture supply-side responses and dynamic effects.	Controlling for confounding factors, a comparison of consumer behaviour before and after intervention can be used to assess the efficacy of the intervention.
Subjective wellbeing (SWB)	Where data is readily available, SWB offers a quick assessment on whether consumer choice is optimal.	The SWB effect of a field trial may not be easily captured by existing surveys. However, in some cases the likely SWB impact can be estimated based on existing information.[7]	Controlling for confounding factors, a comparison of SWB before and after intervention can be used to evaluate the efficacy of intervention, providing they are

[5] These approaches have been used by the FCA to assess whether consumers have made good financial decisions or to test whether such decisions can be improved by regulatory interventions: see the FCA Occasional Paper series.

[6] For example, see Adams et al (2015) and Adams et al (2016).

[7] In considering the affordability rules on mortgage lending (FSA, 2012) and the price caps on high-cost short-term credit (FCA, 2014), the FSA/FCA used the SWB approach to inform the likely well-being impact of the proposed interventions.

			adequately captured by surveys.

More importantly, given their respective limitations, these valuation techniques can best be used as complementary measures for providing a more complete view for the policy maker of consumers' true preferences and the likely benefits of intervention.

These recommendations reflect the author's current understanding of the strengths and weaknesses of these techniques, and should not be treated as definitive prescriptions of how to assess consumer benefits. As understanding of these techniques evolves, so too should the way they are used to guide policy decisions.

This article adopts the conceptual frameworks for thinking about behavioural biases and market failures from Erta et al (2013) and Iscenko et al (2016). The first provides a framework for thinking about behavioural biases, while the second discusses how the FCA identifies and addresses market failures and harms in financial markets.

Additionally, the discussion around measuring revealed preference through field trials is linked to When and how we use field trials (FCA, 2018a), and the discussion around consumer benefits relates to How we analyse the costs and benefits of our policies (FCA, 2018b).

2 Consumer welfare

As stated in its mission (FCA, 2017a), the FCA seeks to address potential or actual harm to consumers in the markets it regulates. The consumer benefits of regulatory intervention can be measured by the extent to which an identified harm can be remedied or mitigated. Some of these benefits, such as changes in price, may be relatively straightforward to measure, but others are more difficult to quantify.

In the presence of information asymmetry and behavioural distortions, we as consumers can make decisions that are not in our best interests. Welfare analysis provides a regulator with a framework for assessing the degree of consumer harm that can result from such market failures, and the potential benefits of regulatory interventions.[8]

This chapter discusses the impact of behavioural distortions and information asymmetry on consumer welfare. This includes discussions on normative and revealed preferences, financial and non-financial benefits to consumers arising from interventions, and the distributional effect of interventions.

Normative preference

Normative preferences reflect what people *should* choose, as opposed to what people *actually* choose (revealed preference). They prescribe the best choice consumers can make according to some criteria, and form the basis for assessing the extent to which actual behaviour is suboptimal.

A common definition for normative preference is the concept of true (or context-free) preferences. Erta et al (2013) describe true preferences as "outcomes that [consumers] would really want to achieve", and use this to define consumer detriment as "the gap between the outcomes that consumers actually get and the outcomes that are in their best interest". Similarly, Beshears et al (2008) define normative preferences to be "preferences that represent the economic actor's true interests".

The existence of true preferences has been called into question in recent times (eg Infante et al, 2016): there is no definitive way of determining which of the multiple sets of preferences, expressed by the same individual in different contexts, best represents her interests. If true (or context-free) preferences cannot be established, then it may be problematic to define consumer detriment and the potential benefits of interventions.

This paper adopts the interpretation that normative preferences represent the outcomes that are in the best interests of consumers, and that `best interests' can be estimated. The term 'true preferences' is used throughout. Where consumers' true preferences are ambiguous, policy makers can introduce various degrees of paternalism to define these for policy purposes:

[8] Behavioural distortions and information asymmetry can interact with other forms of market failures, such as market power, externalities, and regulatory failures, to result in consumer harm.

1. They may assume certain preferences to be axiomatically true. For instance, they may assume that all else equal, consumers prefer a cheaper product to a more expensive one. However, in most real-life cases, there are often trade-offs to be made between price and other product features across choices, so a dominance relationship between choices may be difficult to establish, particularly for products with multiple features.[9]
2. They may define normative preferences as those expressed in an active choice environment,[10] with hindsight, or by certain individuals such as educated consumers.[11]
3. They may define normative preference as that which best reflects consumers' subjective well-being. This is explored further in Chapter 3.
4. They may define normative preferences based solely on how, as policy makers, they think consumers *should* behave based on certain principles, without reference to consumers' expressed view or behaviour.

Which interpretation a policy maker adopts may depend on the specific circumstances and the available information in each case, as well as how much mandate the policy maker has to base policy decisions on paternalistic concerns.

Even where true preferences are ambiguous, the techniques discussed in this paper, when combined with some paternalistic view about consumer preferences (such as those discussed above), may help to provide a robust view as to whether, on balance, a particular intervention may be preferred to inaction.

Market failures that affect decision making

Examples where the choices we make (i.e. revealed preferences) may not reflect the outcomes that are in our best interests (i.e. true preferences) may include:

- taking out a high-interest loan when cheaper alternatives are readily accessible
- taking out a mortgage despite being unlikely to be able to service it
- purchasing an insurance product that does not cover the relevant activity/person/belongings/health condition
- failing to plan sufficiently for retirement.

Suboptimal decisions can be driven by certain broad categories of market failures. Market failures are features of a market that may cause poor social and consumer outcomes compared to a well-functioning market.[12] The market failures that can cause us to make suboptimal decisions (given the availability of products and services on the market) include:

- **Asymmetric information**, where the consumer has less information about the product or the likely future states of the world than the supplier.
- **Behavioural distortions**, which include

[9] A dominant choice is one that is better than all other alternatives in all of the relevant features, including price. A dominated choice is one where a dominant alternative exists. See Iscenko (2018) for an example of establishing dominated mortgage products.

[10] Active choice is a choice that is actively made, and contrasts with a passive choice where the default option is accepted by taking no action.

[11] Beshears et al (2008) discuss a number of these approaches as complementary ways to jointly infer normative preferences.

[12] For a discussion on information asymmetry, behavioural distortions, and other market failures in financial markets, see Iscenko et al (2016).

- Behavioural biases, such as present bias, reference dependence and loss aversion, overconfidence, projection bias, framing, and salience, among others.[13]
- Cognitive limitations that may prevent a good decision. This can occur where a product is complex or its benefits depend on an uncertain future state of the world, or where a decision must be made within limited time which does not allow for its consequences to be adequately assessed.

These market failures can affect our decision making, and potentially result in consumer harm and social inefficiency. This paper focuses on the task of measuring consumer harm with a view to addressing asymmetric information and behavioural distortions only, acknowledging that there will be other factors a regulator will consider with any proposed intervention (including potential harm arising from other market failures such as market power and externalities).

It should be noted that sometimes there are reasonable explanations for not choosing the individually optimal deal: search and switching costs (in time and money) can make otherwise attractive alternatives costly to find and obtain. Choosing a reasonable (but not optimal) product may be well-aligned with our interests given these additional costs. In these cases, a regulator's priority may be to intervene in ways that will reduce search and switching costs. This paper focuses on cases where search and switching costs are not the main causes of poor decisions.

Figure 1: Measuring true preferences

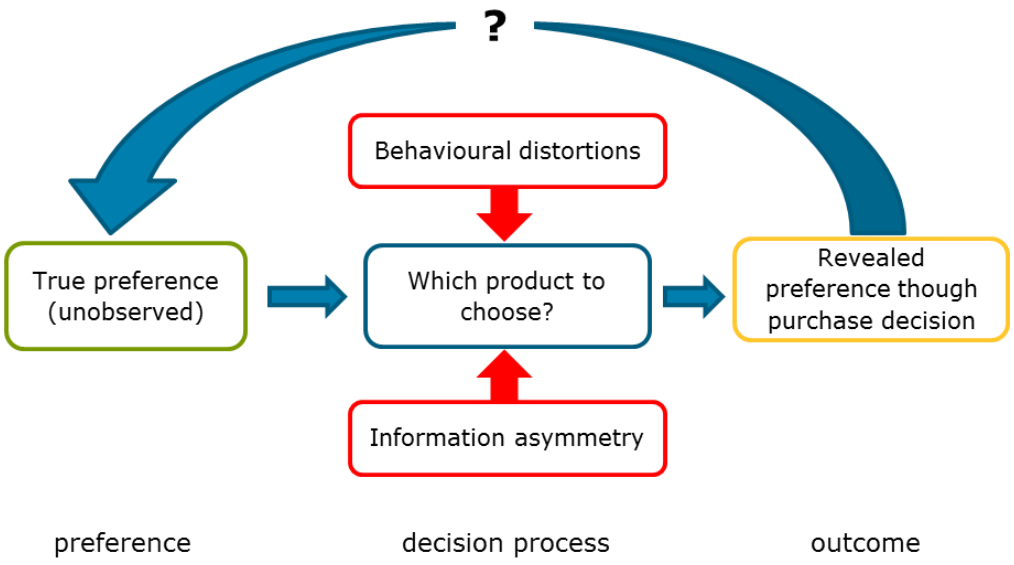


Figure 1 illustrates a framework for considering whether we are making good financial decisions. It assumes that, as consumers, we have true preferences over a range of financial products (including 'no purchase'), but those preferences cannot be directly observed. The framework recognises that we make purchasing decisions under various internal and external influences that can broadly be characterised as behavioural distortions and information asymmetry, and that only the purchase decision is observed. The challenge for a regulator is to determine whether the purchase decision is consistent with our true preferences, and if not, how they can be better aligned (this is shown with a question mark in Figure 1).

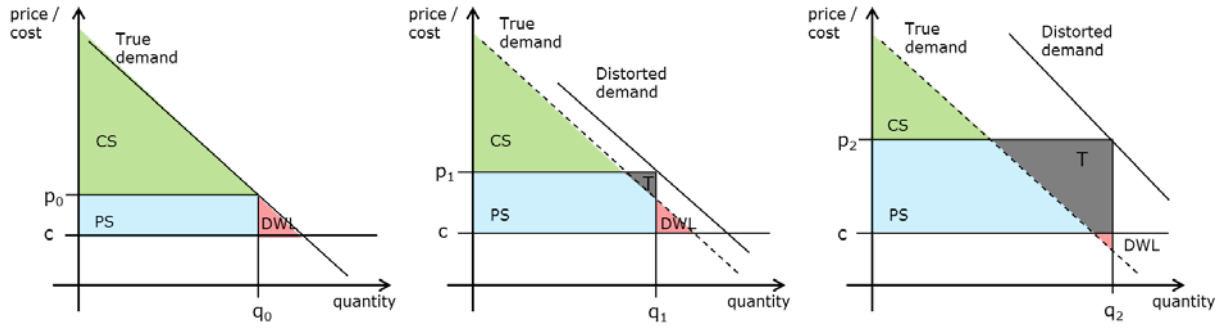
[13] See Erta et al (2013) for further discussion on behavioural biases in retail financial markets.

One way our revealed preferences can fail to align with our true preferences is through upward demand distortion, where we end up purchasing products at prices higher than our willingness to pay (WTP). An illustration of this effect is set out in Box 1 below.

Box 1: Illustration of demand distortion

Consider the case where distortion leads us to purchase the product even when the price is higher than our true WTP (in other words, the distorted demand is stronger than the true demand). Two scenarios are further considered: one in which the sales generated by distorted demand (where price is above the true WTP) are those where the true WTP is above the cost of production; another in which some of the sales are made where the true WTP is below the cost of production. Assume there is imperfect competition and there are no externalities.[14]

Figure 2: Effects of demand distortion



Undistorted demand **Distortion: scenario 1** **Distortion: scenario 2**

In both scenarios, demand distortions lead us to purchase more than our true demand would dictate, at the new higher price level. This results in a transfer from consumers to producers (areas marked T). The new price levels are assumed to be higher than the original price as firms increase price to maximise their profits given the higher distorted demand.

In the first scenario, social surplus is increased, as shown by the reduced area of the deadweight loss (DWL). This is because additional purchases, while being poor value for consumers, are still made where the true WTP is above the marginal cost of production (c), which means that the purchase is socially efficient. The grey triangle T represents a gain in producer surplus (PS) and an equal loss in consumer surplus (CS).

In the second scenario, the triangular area above the dashed true demand curve represents the loss of CS from overpayment. This has two components: the area T above the marginal cost line represents transfers from CS to PS due to overpayment; the area below the marginal cost level represents DWL due to the production of goods valued below the marginal cost of production.

[14] Imperfect competition is where firms have some market power to set prices above their marginal cost of production (which is assumed to be the same across all firms in this model). An externality is a consequence of a transaction that affects other parties.

Consumer benefits arising from reduction in behavioural distortions

There are times when a financial decision can have a significant non-financial impact that has not been fully factored into the decision.[15] An assessment of whether our behaviour is consistent with our true preference can be better made when both the financial and non-financial effects associated with the use of a financial product are accounted for.

Financial impact

The benefits to consumers that may arise from a regulatory intervention depend on how consumers and producers are assumed to behave absent the distortion. For example, suppose due to some distortion a consumer ends up paying £100 for a product that he truly values at £90 (ie his true WTP for the product is £90). Changes in consumer behaviour alone could have the following static effects:

- if the consumer would otherwise purchase the product from elsewhere (which she had failed to consider due to the distortion), which is available at £80, then there is a benefit of £20 accrued to consumers, assuming there are no additional costs associated with searching and shopping elsewhere.
- if the consumer would otherwise not purchase the product at all, then he would accrue a benefit of £10, equating to the overpayment the consumer would have made in the absence of intervention.

Dynamically, if enough consumers change their behaviour, producers may respond by competing more aggressively and lowering prices, which would result in further increases in consumer benefits.

Non-financial impact

In assessing our willingness to pay for a product, a policy maker might expect rational consumers to fully account for the potential non-financial impact associated with a financial product, such as stress when unable to service debt or the peace of mind of having insurance cover. However, in practice behavioural distortions and information asymmetry can also lead us to overlook non-financial impacts and distort our willingness to pay for the financial product.

A policy maker can interpret the price at which a consumer is willing to pay for the product, having failed to take fully into account the financial and non-financial impacts that may arise, as distorted WTP. She can also interpret the price that a consumer would be willing to pay, having fully appreciated the financial and non-financial impacts that may arise, as true WTP. The difference between the distorted and true WTP reflects the monetised value of the distortion, and the potential benefits that can arise from intervention.[16]

For example, suppose a financial product has poor service quality that would eventually result in stress for its users, but have no direct financial detriments. In the absence of the knowledge or awareness about this aspect of the product, a consumer may prefer the low service quality product to a high service quality product which is more expensive but ultimately better suited for the consumer. The benefits of a more informed decision are

[15] For example, consumers can experience high levels of stress when they fail to meet the terms of repayment of debt and mortgage products, which they may not have fully accounted for in their decision to take out the product.

[16] The subjective wellbeing measure discussed later in this paper offers a way to capture the full financial and non-financial impacts of a product where the WTP expressed by some consumers may be distorted.

conceptually captured by the difference in consumer surplus (ie the true WTP less the price of the product) between the two purchasing decisions.

Consumer surplus and consumer welfare

Consumer surplus is the unweighted sum of the individual surpluses of consumers, where an individual's consumer surplus on a unit of the product consumed is the difference between her willingness to pay for it (according to her assumed true preferences) and the price she paid.

It is common in policy applications to assume that consumer welfare is equivalent to consumer surplus. This definition implicitly accepts that an individual's surplus captures all aspects of an individual for which a policy maker needs be concerned about, and no further weights need to be applied when comparing the benefits accrued to different individuals.

While other forms of aggregation exist, a detailed discussion on alternative forms of aggregation is beyond the scope of this paper. This paper follows the convention of taking the simple sum of individual surpluses to calculate the consumer welfare. However, where a regulator wishes to privilege certain consumer groups (such as consumers considered financially vulnerable), it may diverge from this convention.[17]

[17] See Cowell & Gardiner (1999) for a detailed discussion on welfare weights.

3 How to measure the benefits of intervention

Having considered the nature of behavioural distortions and information asymmetries that can reduce consumer welfare, this chapter considers three common approaches for assessing true preferences and measuring the benefits of interventions, namely **stated preference**, **revealed preference**, and **subjective well-being**. It then discusses some of the specific techniques deployed in these approaches.[18] Broadly, these techniques may be used to serve a number of purposes in regulatory decision making:

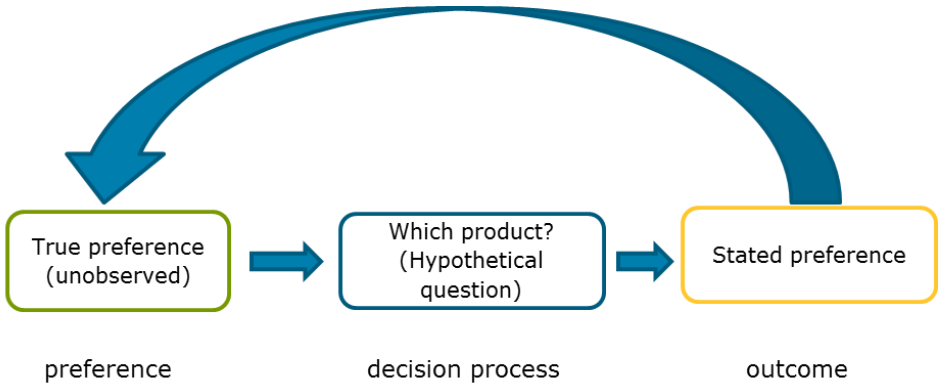
- Identification and diagnosis of consumer harm – they may inform a regulator about whether we as consumers are making optimal decisions in the current market environment, by allowing the regulator to compare actual choices with optimal choices. In other words, these approaches help to define the benchmarks for good decisions. Understanding how much we as consumers make suboptimal decisions, and why, enables a regulator to assess whether regulatory intervention is warranted.[19]
- Ex ante remedy appraisal – they may inform a regulator about the likely behaviour of consumers in an alternative decision environment, and therefore allow the regulator to estimate the potential benefits of intervention. They may also be used to value benefits in monetary terms when a market price is not available (eg health benefits).
- Ex post policy evaluation – they may also be used to evaluate the efficacy of existing regulations by assessing the decisions we as consumers make before and after intervention, against what is understood to be our optimal choice.

Stated preference

A stated preference approach is one where we as consumers are directly asked about our preferences, or asked to make choices in a hypothetical environment. Figure 3 illustrates the process through which the stated preferences of consumers inform a regulator about consumers' true preferences. It assumes that by asking respondents hypothetical questions in a controlled environment and with full information provision about the products, that their expressed preferences over a range of products (or product features) would closely reflect that of their true preferences.

[18] See Beshears et al (2008) for a discussion on complementary approaches to jointly identifying normative preferences.
[19] For example, see Iscenko (2018).

Figure 3: Assessing suboptimal decision through stated preference



A number of stated preference techniques have been developed, a selection of which is shown in Table 2 below.

Table 2: Stated preference techniques

Approach	Technique	Example question on WTP
Choice experiment	Contingent ranking	"Rank the following products in order of preference: A, B and C."
	Contingent rating	"Please rate this product using a scale of 1 to 10"
	Pairwise comparison	"Which of these two products, A or B, do you prefer?" (Allow multiple levels of preference, such as 'strongly prefer A', or 'slightly prefer B'.)
	Discrete Choice Modelling	"Which of the following products would you buy: A, B, C or D?"
Contingent valuation	Opened-ended	"What is the maximum price you would pay for this product?"
	Dichotomous choice	"Would you pay £5 more for this product?" (initial price level is randomised)
	Iterative bidding	Begin with a low price, and repeat "would you pay an extra £5 for this product?" until the response "No" is reached.
	Payment card	"Which of the amount listed below would you at most pay for this product?"

Source: Accent & Rand Europe (2010), based on Bateman et al. (2002) and Kjaer (2005).
Note: Example questions relate to the WTP for products and services; alternative questions can be used to elicit respondents' willingness to accept (WTA).

This section focuses on a particular technique within the stated preference approach, namely Discrete Choice Modelling (DCM)[20], which is particularly relevant for assessing consumers' WTP for financial products for the following reasons:

- Financial products are often complex and can contain a number of important features, including a number of pricing components such as upfront fee, ongoing fee and fees

[20] This technique may also be termed discrete choice experiment (DCE) or choice-based conjoint analysis (CBC). This technique can also be used to analyse observational data (i.e. actual, rather than experimental, behaviour).

that are contingent on some uncertain events. DCM assesses the valuation consumers place on not just the product as a whole, but the levels of each product attribute.

- DCM replicates the choice situation rather than directly ask respondents for their WTP. Given its design, choice experiments are thought to be less susceptible to some of the issues affecting the validity of contingent valuation techniques (such as response bias), some of which will be discussed later in this section.[21]

Discrete Choice Modelling

DCM is a technique for estimating the consumers' willingness to pay with respect to each product attribute. It is typically conducted in a lab setting, where participants are asked to choose from several products. An example of question may be: "Which of the following products do you prefer: A, B, C or D?"

DCM is typically used to forecast the demand of a new product based on its attributes (including price). However, recognising that (just as in real life) the choice environment can impact the decisions that people make, DCM may also be used to inform how alternative presentations of product features can affect consumer choice. For example, a policy maker may observe that while people seem willing to pay a high-premium for a product feature under a certain representation of such feature (eg expressed as % of the original price), they may not be so willing to pay the same feature premium under a different representation (eg expressed in £s).

All of the alternatives presented in a DCM exercise would have a selection of product attributes/features. For example, a mortgage product may contain attributes including interest rate (the ongoing cost of borrowing), product fee (the one-off cost of borrowing), fixed or variable rate (whether the interest rate is fixed, or tracks the BoE base rate), deal period (the period after which the interest rate reverts to the standard variable rate from the fixed or tracker rate), and the early repayment charge (the cost of repaying the mortgage prior to the expiry of the deal period).

Each of these attributes is designed to take a few levels. For example, for a mortgage product, the initial interest rate attribute of a product may take the value of 1.25%, 1.50%, 1.75%, 2.00% or 2.25%; its deal period may take the value of 2 years, 3 years, 5 years, 10 years, or lifetime; and its interest rate may be fixed or variable.

By choosing from alternative products with different attribute levels (including one or several attributes relating to price, such as the product fee and interest rate), the respondents provide the experimenter with information on how much they value different levels of the attributes with respect to the price components of the product. This information can be aggregated across responses (from the same respondent) and across respondents to estimate the WTP for each attribute level.

One way the choice environment can be changed is that instead of being presented with product features and prices, participants can be asked to choose between financial outcomes and the costs associated with each, eg combinations of retirement income and pension contribution. This reduces the cognitive complexity of the problem and may get people to express choices that reflect their true preferences.

[21] Adamowicz et al (1998) discusses a number of these issues in the context of passive use values.

Random utility model

The theoretical underpinning of DCM is the random utility model. The model assumes that the probability with which a respondent chooses one alternative over another, say mortgage A over mortgage B, is directly related to the utility that the respondent derives from mortgage A over mortgage B. In other words, it assumes that the stronger a respondent prefers one product over another, the more likely that the respondent will choose that same product over the other.

In the random utility model, choice is modelled probabilistically for two reasons: inter-personal differences between respondents, and intra-personal differences between the utilities derived from each decision for the same respondent. The former reflects the fact that, within a population, consumers have different preferences or 'tastes', and therefore the choices made by consumers in aggregation can appear probabilistic. The latter captures the fact that an individual may not make the optimal decision each time, and allows for some room for error in choosing between similar products.[22]

Considerations with the use of stated preference including DCM

There are a number of well-researched issues associated with the use of DCM and stated preference techniques, which are explained in detail in other papers.[23] Table 3 below sets out a number of these issues that are particularly relevant in retail financial markets.[24]

The stated preference approach has traditionally been used to value public goods for which there is no market price. These valuations, based on stated preference, may be the best approximation available for the WTP for these goods. Among stated preference techniques, DCM provides more granular information about the respondents' preferences, and is shown to be less affected by some of the known issues compared to contingent valuation techniques.

However, what is less clear is whether the stated preference elicited through DCM can closer represent consumers' true preference than actual purchasing behaviour (revealed preference) in retail financial markets. A policy maker should carefully weigh the potential issues with stated preference (as discussed below) against the potential behavioural distortions and/or information asymmetry in revealed preference when considering this approach.

Table 3: Known issues and design considerations in DCM

Issue	Description	Design considerations
Loss aversion	Researchers have found that people's willingness to accept (WTA) the loss of a possession is generally much higher than their willingness to pay for the same item, and this is true of both stated and revealed preferences (Kahneman et al, 1990, Bateman et al, 1997). The way a question is framed (either as the WTP for a positive	This is typically a problem when valuing the provision of public services, where respondents tend to value the reduction of a service much more highly than an equivalent improvement in the service. In financial services, the framing of certain products, such as insurance (eg

[22] See Ben-Akiva, McFadden & Train (2016) for technical discussion on the theoretical underpinnings of DCM.

[23] Hausman (2012) offers a number of critiques on contingent valuation methods. Adamowicz et al (1998) offers support for the use of choice experiments (of which DCM is one) over contingent valuation techniques to elicit passive use values.

[24] See also Accent & Rand Europe (2010).

	outcome or the WTA foregoing that outcome) can therefore affect people's valuation.	WTP for insurance premium or WTA risk?) may induce this effect.
Embedding / scope effect	This can broadly be characterised as the insensitivity of WTP to the size of the effect. For example, Diamond and Hausman (1994) found that the stated WTP for cleaning up one lake is similar to the WTP to clean up five lakes when using a contingent valuation technique (where respondents are asked directly about their WTP for the whole effect).	Adamowicz et al (1998) suggest that in a choice experiment (such as DCM), scope is built-in as attribute levels, such that the choices made by respondents reflect whether they are sensitive to the different attribute levels.
Response bias / Yea-saying	Just as the environment in which consumers make purchasing decisions in real-life can trigger behavioural distortions, the environment in which the choice modelling experiment is conducted can also trigger additional biases.	The phrasing of the questions asked, the appearance and behaviour of the experimenter, the sequence in which questions are asked, and the desire for participants to be 'helpful' to the research by providing what they believe to be the desired answers, may contribute to the presence of response bias that is not present in real-life.
Hypothetical bias	A number of empirical studies have found respondents systematically over-state their WTP under hypothetical scenarios where there is no commitment to purchase, compared to the setting where they are required to purchase the product at the stated WTP.[25]	Breidert et al (2006) found that, compared to contingent valuation techniques, DCM tends to be less susceptible to (but nonetheless still affected by) hypothetical bias.
Persistence of distortions in stated preference	One of the principal concerns when using stated preference techniques to gain a better understanding of true preferences, compared against revealed preferences, is whether the identified distortions in real-life decisions could also distort the decisions respondents make in a DCM exercise.	The choice and design of the exercise must be carefully considered: does it avoid or mitigate the specific distortions that have been identified in the market, provide sufficient information to the respondents, and ensure that the complexity of the choice problem is within the cognitive capacity of the respondents?[26]
Transaction and search costs	Related to the issue of hypothetical scenario is the absence of transaction and search costs in the choice exercise. By presenting a range of alternative products in front of the respondent, the choice modelling exercise abstracts away the search costs and transactions costs that are often present in the real world.	This can bias the findings in favour of products that are in practice difficult or costly to find, or involve high transaction costs. To overcome this, experiments can be designed so that respondents incur cost to observe other products on the market.

[25] See Breidert et al (2006) for a survey of these studies.

[26] Where the goal is to extract the true WTP for a feature of a product, a policy maker would like to remove any distortionary effects from the stated preference survey. Where the goal is to predict how consumers will respond to changes in the decision environment, then the presence of other distortionary effects found in the real world adds to the external validity of the results.

Linearity assumption	In the case of DCM, a linear random utility function is often assumed, with the implication that different features of a product have an additive effect on the valuation of the product (ie the whole equals the sum of its parts).	This assumption can lead to poor model estimate when important features are missing from the experiment, or where product features interact with one another in a non-additive way. For example, a long-term warranty may be valued highly if the product has an important feature that is known to be unreliable and prone to fail; a long-term warranty would be much less valuable for an alternative product without such feature.

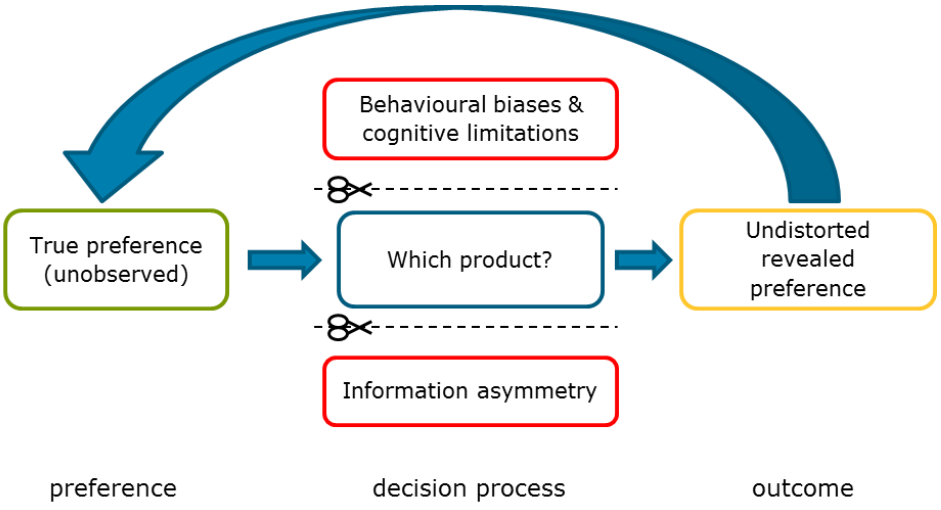
Revealed preference purification

Revealed preference is the preference inferred about we as consumers given the choices we make. If a policy maker suspects that consumer behaviour is not optimal, then revealed preference may not reflect the choices that are consistent with a consumer's interest.

Revealed preference purification is the idea that by removing some of the known causes of distortions, or by mitigating or controlling the effects of such distortions, our behaviour as consumers would be better aligned with our best interests.

There are two broad approaches to revealed preference purification: one is to observe how consumers behave in decision environments where the known causes of distortions are less effective (eg by avoiding passive choice and by allowing consumers to learn from the outcomes of repeated interactions).[27] Another is to first estimate the known effect of some behavioural distortion based on prior knowledge, then reconstruct the optimal choice by reversing the effect of the distortion on the observed behaviour.[28] Both approaches can be conducted in field trials or through natural experiments.

Figure 4: Assessing true preference by refining revealed preference



[27] See Beshears et al (2008) for a discussion on the factors that could lead revealed preferences to deviate from normative preferences.

[28] See Infante et al (2016) for a survey of these studies.

Figure 4 illustrates the idea behind revealed preference purification: it attempts to infer our true preference by observing what we as consumers would have chosen in environments free of distortions, or by reconstructing what we would have chosen if the distortive effects were mitigated.

Assessing and lessening distortions in revealed preferences

A policy maker can make a number of comparisons to identify whether the decisions that consumers make may be distorted:

- compare the purchasing behaviour of consumers of the same product under alternative circumstances
- compare the purchasing behaviour of consumers in similar products, but with differences in certain product characteristics that may trigger distortion
- compare the purchasing behaviour of consumers to their responses in a survey or experiment (ie revealed preference vs. stated preference)

For example, in Guaranteed Asset Protection (GAP) insurance (FCA, 2015), the FCA found that similar products were sold at very different prices depending on the channel of sale: the insurance premium on products sold as add-ons by the car distributors averaged around £300 while the premium on stand-alone products averaged around £150. Moreover, the add-on GAP product attracted a much lower claim ratio (10%) compared to other general insurance products (30-50%).

It is reasonable to assume that the bundling of GAP insurance with the car purchase confers some benefits to consumers (such as time saved and convenience), for which consumers may be willing to pay a higher overall price. However, given the large difference in the prices between the two distribution models (£150 vs £300), it is also reasonable to suspect that the point-of-sale advantage enjoyed by the car distributor may have triggered certain behavioural distortions or information asymmetry, leading consumers to rush into the purchase without further surveying the GAP insurance market and assessing their own need for the product.[29] While this observation does not itself indicate the extent to which consumer behaviour has been distorted, it does suggest that further investigation is warranted.

Another example comes from a field experiment conducted by the FCA on whether consumers claim redress under different designs of the notice letter (Adams & Hunt 2013). The experiment was motivated by the assumption that some consumers do not claim redress not because the cost of doing so outweighs its benefits, but due to inertia or the complexity or opacity of available information.

Note that neither of these examples attempted to reconstruct true preferences: the GAP insurance example assumed that some consumers would benefit from purchasing standalone products at a much lower price without establishing their true WTP. The notice letter experiment did not attempt to capture the true preference of consumers; rather it tested ways of affecting the response rate of different letter designs under the assumption that there is under-claim. These shortcuts may be applied where there is reasonable confidence that the proposed intervention would result in a better alignment between choice and true preference, and would not over-correct consumer behaviour or introduce other forms of distortions.

[29] See Iscenko et al (2014) for further discussion on the point-of-sale advantage enjoyed by distributors selling add-on products.

Considerations with the use of preference purification

How true preferences are approximated, or consumer behaviour assessed under alternative environments, depends on the availability of suitable alternative circumstances or related products, and whether it is feasible to conduct field experiments. Some of the known issues associated with stated preference, such as loss aversion, are also found in revealed preference, and should be carefully considered in the design of the study. Potential sources of revealed preference information are discussed below.

Comparable markets and natural experiments

Where comparable markets or natural experiments are present, they offer readily available benchmarks against which consumer behaviour can be assessed. In the case where the same product is sold under different decision environments (eg insurance sold as an add-on or standalone product), the differences in the prices paid between the two decision environments can signal that behavioural distortions or information asymmetry have affected consumers' ability to make optimal decisions. [30] However, given that the environment of comparable markets or natural experiments cannot be fully controlled, the behaviour observed in these alternative environments is unlikely to be distortion free. Care should be taken to consider whether consumers' behaviour in alternative environments reasonably reflects their true preferences, or reflects another set of distorted preferences that may nonetheless be more favourable to the existing one.

Comparable markets or natural experiments therefore, where available, provide low-cost and realistic ways to examine consumer decisions under an alternative environment, and despite their shortcomings discussed above, can be useful for monitoring and identifying the presence of behavioural distortions.

Field experiments

Field experiments (or field trials) are primarily used to assess the potential benefits of regulatory intervention rather than as a monitoring and identification tool, as they provide a testing ground for the efficacy of the proposed intervention in the real world environment. Before testing the effect of a proposed intervention, it is important to establish what would be the behavioural improvement that leads consumers to make decisions better aligned with their true preferences. For example, a regulator should first establish that consumers currently make suboptimal choices according to their true preferences because of a lack of attention paid to a specific product feature, before it can conclude that an intervention which draws greater attention to that specific product feature would be beneficial for consumers.[31]

Subjective well-being

An alternative way to assess consumer choice and the benefits of intervention is to examine the subjective well-being (SWB) of the individual. In this approach, a policy maker assesses whether, according to our own assessment of our well-being (which is subjective by nature), we have made good decisions as consumers.

[30] Even where differences in the willingness to pay for the same product under different circumstances are observed, a policy maker would consider whether these circumstances confer additional value to the consumer (eg convenience, reduced search costs) before concluding that such differences are the result of behaviour distortions or information asymmetry.

[31] For more detailed discussion on the use of field experiments, see FCA (2018)

There are three broad measures of subjective well-being discussed in the SWB literature:[32]

- **Life evaluation**: this concept captures how we remember past events and therefore make future decisions based on that memory. It is commonly expressed as life satisfaction;
- **Affect**: this concept captures the emotional experience of recent events, and can be expressed positively as 'happiness' or negatively as 'distress'.
- **Eudemonia**: this concept captures the 'flourishment' of one's life, which can be determined by a range of factors including the meaningfulness or purposefulness of one's life, self-esteem, possession of interest and engagement, sense of autonomy, optimism, resilience, and others.

Studies suggest that while these three measures of SWB are positively correlated, they are distinct measures of well-being.[33] Life satisfaction is generally accepted to be the best single-measure of well-being, since it is relatively stable over a short time horizon (eg from day to day), has a clear interpretation, and has been shown to have some predictive power over the individual's future behaviour.[34]

Measures of affect (such as 'happiness' or 'stress') are time consuming to collect, and are subject to high volatility from day to day. Measures of eudemonia are potentially appealing, but there is currently no consensus on what measures should be encompassed by this concept, nor which questions to use to elicit how people feel about the factors of eudemonia.[35]

A standard assumption used to align SWB with the preference-based framework is that, when unaffected by behavioural distortions and information asymmetry, we make choices that result in the most positive outcome for our subjective well-being.[36]

This interpretation can be considered more paternalistic than a preference-based approach: it makes the normative assumption that as consumers we *should* prefer products that would better our subjective well-being, and therefore the optimal choice is one that optimises our SWB.[37]

[32] For example, see OECD (2013)

[33] O'Donnell et al (2014) found the correlations between measures of SWB to be below 0.5, while Mukuria et al (2016) found that they range between 0.7 and 0.85.

[34] Benjamin et al (2012), Ward (2015)

[35] Layard (2016) discusses issues associated with various singular and composite measures of well-being.

[36] See Benjamin et al (2012) for examples of this interpretation.

[37] See discussion on normative preference in Chapter 2.

Figure 5: Assessing subjective well-being

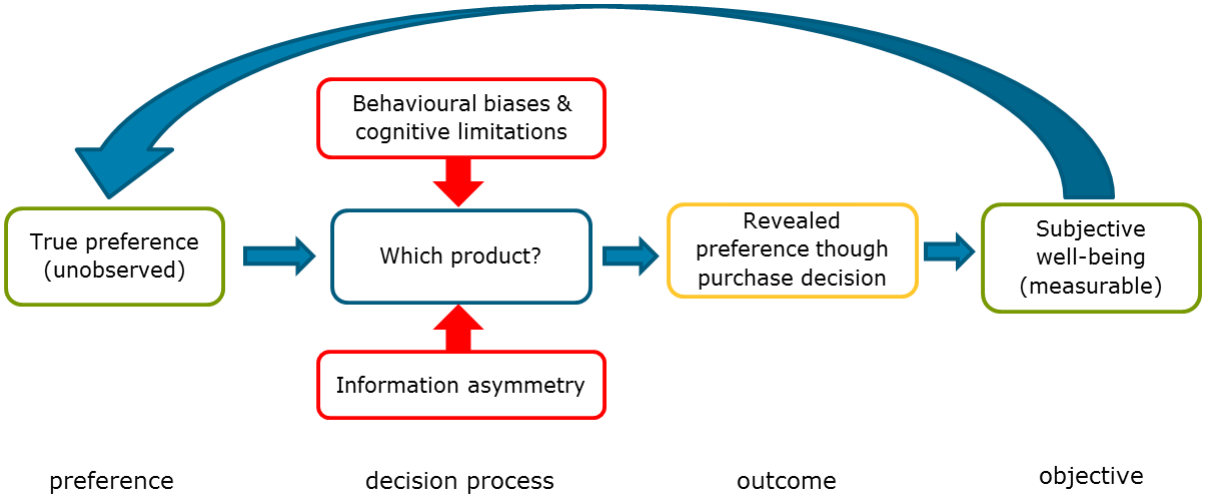


Figure 5 illustrates the idea behind this approach. It assumes that, as consumers, we have preferences for financial products or services that best serve our SWB, according to our experiences.[38] This framework also acknowledges that, due to the presence of behavioural distortions and information asymmetry in the decision environment, the purchase decisions we make may not best reflect our true preferences. While true preferences cannot be directly observed, a policy maker can attempt to measure our SWB after we have made purchase decisions, and consider whether our choices were consistent with our experienced SWB.

If, at the aggregate level and controlling for macroeconomic factors, our SWB improves after making certain financial decisions, a policy maker may conclude that our revealed preferences are sufficiently well aligned with our SWB (while the regulator cannot observe whether we as consumers have made the best decision, at least we have not made a decision that made us worse-off). If however, a policy maker finds that our SWB suffers considerably after making certain financial decisions (such as taking out debt that they subsequently failed to service), then it may conclude that behavioural distortions and information asymmetry that exist in the decision environment had significantly affected our ability to make decisions that align well with our SWB.

If a financial decision can lead to several potential outcomes for an individual (eg whether a mortgage can be serviced without difficulty), some of which are positive and others negative, then a regulator should carefully consider whether, on the balance of probability and the severity of each potential outcome, the financial decision truly serves the SWB of the individual.[39]

Use of SWB to measure benefits

Under the SWB approach, the policy maker measures the effect of different purchasing decisions on the SWB of an individual (or the representative consumer in a population

[38] An alternative approach is to use predicted SWB (rather than experienced SWB), before consumer had used the product. In reactive regulatory circumstances, a policy maker may have access to experienced SWB, collected through surveys conducted on consumers who have utilised the product. In preventative regulatory circumstance, a policy maker may have to elicit predicted SWB through surveys on the likely outcome of its intervention, which can suffer from similar problems as state preference techniques.

[39] For example, in the Mortgage Market Review (FSA, 2012), the FSA considered the merits of a lending restriction by weighing the benefits of preventing the default of a minority of high-risk borrowers against the costs of preventing the majority of high-risk borrowers from taking out a mortgage that they would likely have been able to service.

segment). From this, the policy maker can assess whether an individual has made suboptimal decisions (ie decisions that lead to losses in their SWB relative to the alternatives available), and if so, the extent to which alternative choices can bring about better outcomes for the individual.[40]

An established approach for using the SWB measure is to use survey data to capture the relationship between the physical, mental, and financial states of individuals and their subjective well-being measures, such as life satisfaction. [41] This approach attempts to establish the causal relationship between a driver of life satisfaction (such as whether an individual is in debt arrears) and their life satisfaction, and the marginal impact such driver has on life satisfaction.

Once established, their marginal impact can be compared against the marginal impact of income on life satisfaction (another driver of life satisfaction that is frequently collected in surveys), to establish the effective financial compensation that is required to offset the negative impact of a driver such as being in debt. This monetised value is known as the 'shadow price' or 'compensating value' of the negative driver on life satisfaction. This is demonstrated in Box 2 below.

The conversion of life satisfaction units to monetary value has some serious limitations, which is discussed in the next section. Nonetheless, given the convention of appraising policy proposals in monetary terms, it offers a partial solution for incorporating the non-financial impacts of a policy maker's proposed interventions into their appraisal.[42]

[40] Since SWB capture the overall well-being of an individual across all aspects of life, the financial decision must have a significant impact on the individual's SWB for its effect to be detectable.

[41] In the UK, the Understanding Society survey (ISER) and the Wealth and Assets Survey (ONS) are two longitudinal surveys containing a range of SWB questions. The first wave of the Financial Lives survey (FCA, 2017) contains information about consumer holdings of financial products. Further information about the Understanding Society survey can be found in Annex 1.

[42] An alternative currency for policy assessment, based on SWB, has been proposed: see O'Donnell el at (2014) and Layard (2016) for discussions.

Box 2: Converting well-being units to monetary values

The following example of 'happiness calculus' is taken from Blanchflower & Oswald (2004), where the paper considered the association of various demographic characteristics with self-declared happiness in the US and the UK using an order logits model:[43]

"The relative size of any two coefficients provides information about how one variable would have to change to maintain constant well-being in the face of an alteration in the other variable. To 'compensate' for a major life event such as being widowed or a marital separation, it would be necessary—this calculation should be treated cautiously but it illustrates the size of the coefficients—to provide an individual with ~$100,000 extra per annum. Viewing widowhood as an exogenous event, and so a kind of natural experiment, this number may be thought of as the 'value' of marriage.

If high income goes with more happiness, and characteristics such as unemployment and being black go with less happiness, it is reasonable to wonder whether a monetary value could be put on some of the other things that are associated with disutility. Further calculation suggests that to 'compensate' men exactly for unemployment would take a rise in income of ~$60,000 per annum, and to 'compensate' for being black would take $30,000 extra per annum. These are large sums, and in a sense are a reflection of a low (happiness) value of extra income."

Table 4 shows coefficients on income, widowhood, unemployment and being black in the US, when a number of demographic characteristics are regressed on self-declared happiness, as well as the calculus for reaching the above compensating values.

Table 4: The compensating income for holding certain demographic characteristics in the US

Demographic characteristics	Coefficient	Coefficient as multiple to the income coefficient	Compensating income (USD)
Household income (USD '000)	0.0137	1	-
Widowed	-1.1465	-84	84,000
Unemployed	-0.8029	-59	59,000
Black	-0.4227	-31	31,000

Note: the relationship between happiness and income is assumed to be linear in this model. For models where income enters the regression in logarithmic scale, the compensating income for each characteristic will depend on the income level of the respondent.

Considerations with the use of subjective well-being measures

A number of potential issues should be considered when using subjective well-being measures, some of which relate to data limitations and others to methodological

[43] While more recent studies have refined this approach to better control for some of issues discussed below, Blanchflower and Oswald (2004) is used here as a demonstrative example due to the simplicity and clarity of its interpretation. The ordered logits model takes the form: $SWB = \beta_0 + \sum_i(\beta_i \cdot characteristic_i) + \sum_j(\gamma_j \cdot year\ dummy_j)$, where a range of demographic characteristics, including gender, age, race, retirement status, student status, marital status, education, income, are included in the regression. Fujiwara & Campbell (2011) contains a detailed worked example taken from Luttmer (2005).

challenges. These considerations play an important role in deciding whether SWB is the appropriate approach to take to answer a specific policy question, and if so, how such issues can be handled.

Table 5 below summarises a few issues associated with the SWB approach. For a more extensive discussion on some of these issues and applied recommendations, see Fujiwara & Campbell (2011).

Table 5: Known issues and design considerations in SWB

Issue	Description	Design considerations
Causality	One of the most important issues is whether a causal relationship (rather than correlation) between income and well-being, and between the effects of financial products and well-being, can be established. Studies have generally found a positive correlation between income and subjective well-being (with diminishing returns to income). While it is clear that an increase in income can lead to higher life satisfaction, it has been shown that the reverse causation, where higher subjective well-being leads to higher future income, is also evident.[44] Moreover, subjective well-being and income may both be driven by unobserved individual characteristics (such as emotional intelligence), the omission of which can lead to spurious correlation.	Instrumenting for income and the use of longitudinal survey data to identify individual fixed effects are potential methods to better establish casual relations.
Social comparison effects	There is strong empirical support that relative income level against a peer group (in addition to absolute income level) affects an individual's SWB.[45] Education level is another driver of life satisfaction that has a negative social comparison effect: Clark et al (2018) found that an individual's life satisfaction is negatively correlated with years of education of their peers.[46]	The relative income effect can be controlled by including the average income of the relevant reference group as an explanatory variable, which has a negative coefficient, and increases the coefficient on absolute income. Relative education level can be similarly controlled.
Indirect effects	Income can indirectly affect SWB through its direct and positive effect on other characteristics such as health and place of residence. By controlling for these characteristics that are affected by income in the SWB regression, the full impact of income will be understated as its indirect effects on SWB are not identified. Similarly, if the use of a financial product can indirectly affect SWB through other drivers of SWB (such as inducing stress), then controlling for stress level in the SWB regression	Dolan, Fujiwara and Metcalfe (2011) propose a *Step Approach* to capture the indirect effects of income by dropping the explanatory variables that are affected by income in the SWB regression, such as health and place of residence.

[44] De Neve & Oswald (2012)

[45] For example, see Clark et al (2018) and Luttmer (2015).

[46] Peers are defined as others within the same region, age group, and gender.

	will understate the effect of stress from the use of such financial product. Additionally, if the financial product in question is complementary to another product which is not captured in the regression analysis and affects SWB, then the estimated effect of the use of such financial product on SWB will be biased, as it will also capture the effect of the use of the complementary product on SWB.	
Adaptation	Studies on the persistence of well-being impacts have generally found a strong 'adaptation' effect, which is to say that the positive or negative impact on well-being diminishes quickly over time. For example, Clark et al (2008) found that, with the exception of unemployment, there is complete adaptation to marriage, divorce, widowhood, birth of a child, and layoff, meaning that life satisfaction is returned to the baseline level within 5 years.[47]	These findings suggest that some of the events which impact life satisfaction have a temporal and diminishing effect. The use of longitudinal survey data may allow the well-being impact over time to be identified and measured.
Discounting	Where a policy intervention has impact on subjective well-being over time, a suitable discount factor must be used to quantify future effects.	O'Donnell et al (2014) suggest a 'pure time social discount rate' of 1.5% could be used, which is consistent with the UK Treasury Green Book. This discount rate reflects the general uncertainty about the future, and is expressed in real terms.[48] A SWB improvement in the future could therefore be discounted at this rate before being converted into monetary value.
Distributional effect	Converting the impact of regulatory policy on life satisfaction into monetary units has a particular distributional implication. Studies have shown that the income effect on life satisfaction is strongest for individuals with low income[49], which implies that an equal improvement in the SWB of individuals would equate to a lower monetary value for those with low income than those of high income.[50] Therefore, a policy which seeks to maximise the effective monetary gain of the society will prioritise the SWB of high-income individuals over that of low-income individuals,	O'Donnell el at (2014) and Layard (2016) propose for policy impact to be measured in units of well-being, and thus avoids the conversion from well-being to monetary units.

[47] Since they also identified significant 'anticipation' effect before the event, the baseline level of life satisfaction needs to be defined a few years before the event.

[48] The UK Treasury Green Book (HMT, 2011) adds another discount rate component of 2% to reflect the lower marginal utility of income of a richer future society. O'Donnell et al (2014) note that this second component is redundant where the subject of discounting is already expressed in utility terms.

[49] For example, see Layard, Nickell & Mayraz (2008).

[50] Since the same gain in income generates a higher level of SWB in low-income individuals, a lower monetary gain is required to improve the SWB of low-income individuals by the same amount as high-income individuals. This means that a unit of SWB is worth less in monetary terms for low-income individuals than it is for high-income individuals.

	which runs counter to the accepted direction of redistribution.[51]	
High monetised value	A number of studies have highlighted the exceedingly high monetised value of having adverse health and mental problems, which derives from the generally low impact of income on subjective well-being.[52] This is particularly problematic when the costs and benefits of policy interventions are assessed in monetary terms.	There is currently no satisfactory treatment on how to deal with this effect in the context of policy assessment, save to evaluate the entire impact of a policy in wellbeing terms rather than monetary terms.
Data availability	In order to identify the SWB effect of being in a specific financial circumstance (such as being in mortgage arrears, having poor credit score, or having high credit card debt), these circumstances need to be captured by the survey. While the Understanding Society survey does contain questions on being in payment arrears, and being in poor housing condition (which may be the result of using inappropriate financial products), or having low income/savings in retirement, it does not cover a wide range of financial circumstances in which consumers might find themselves, and for which a policy maker would like to measure the impact on people's SWB. The SWB effect for a wide range of financial circumstances that can arise from consumer's purchase decision may therefore be difficult to estimate.	Annex 1 contains a number of financial questions captured in the Understanding Society survey.

[51] See Layard (2016) for discussion on how to capture inequality in the SWB framework.

[52] For example, see Powdthavee & van den Berg (2011)

4 Applications in financial regulation

The previous chapter reviewed different approaches to infer our true preferences as consumers, or our likely behaviour in an alternative decision environment. These techniques can help a regulator identify markets that may require intervention, assess the potential benefits of intervening in these markets, or evaluate the effectiveness of existing policy.

However, all of the techniques currently available suffer from various implementation, data availability, and resource issues. Some degree of judgement is therefore required to determine which approach to adopt on a case-by-case basis.

Moreover, given their respective limitations, these techniques can be used as complementary measures for providing a more complete view for the policy maker of the true preferences of consumers and the likely benefits of intervention.

This chapter discusses applications of these approaches in informing regulatory policy decisions, and provides some practical guidance on when and how these techniques can be used. These recommendations reflect the author's current understanding of the strengths and weaknesses of these techniques, and should not be treated as definitive prescriptions of how to assess consumer benefits. As the understanding of these techniques evolves, so too should the way they are used to guide policy development.

When to investigate the consistency of consumer behaviour

When should a policy maker investigate whether our behaviour is consistent with our true preferences? This paper has discussed two broad causes for poor decision making: information asymmetry and behavioural distortions (which include behavioural biases and cognitive limitation accompanied by a lack of learning opportunities). A policy maker may decide to investigate markets where these two types of market failures are thought to have strong effects on decisions. In addition, there may be markets where there are other reasons to believe that we as consumers are not making decisions that are consistent with our true preferences.

Erta et al (2013) provide several indicators that might be used to identify such markets, including:

- significant number of consumers suffering from negative outcomes associated with the use of a financial product (eg high and persistent credit card debt, mortgage arrears or default, and poor returns from pension investment)
- high volume of complaints being made to the regulator about certain product features or outcomes. This may indicate that a significant number of consumers do not fully understand the product at the point of purchase
- widespread reports of consumer regret not caused by foreseeable risk (eg high-cost short term credit)

- product inconsistent with other products owned or with stated goals, such as using high cost credit products when savings can be easily accessed or cheaper debt alternatives are readily available
- consumers unable to describe key product features or prices after purchase

When to apply different approaches

How best to assess consumer behaviour depends on the question that a regulator seeks to answer, as well as on the characteristics of the product in question, the availability of data or suitable comparator markets, and the costs to all of the affected parties.

Chapter 3 outlined three potential use cases for a regulator: identification and diagnosis of potential consumer harm, ex-ante remedy appraisal, and ex-post policy evaluation.[53] This section first discusses how the three approaches discusses in this paper may be applied for each of the use cases, noting potential limitations in existing data or suitable comparable markets. It then discusses two general considerations that cut across all use cases, namely the characteristics of the product in question and the costs to all of the affect parties.

Table 6 summarises how different techniques for estimating consumer benefits can be applied in each of these use cases.

Table 6: Applications in policy making

	Identification & diagnosis of harm	Ex-ante remedy appraisal	Ex-post policy evaluation
Stated preference: DCM	DCM may be used to identify whether behaviour is consistent with stated preferences. It is unclear whether stated preference can better reflect true preference than actual behaviour (revealed preference), given the known issues associated with both.	DCM may be used to predict consumer behaviour when features of the product change, or under different choice environments. However, results are likely to suffer from a number of biases.	Observed outcomes (through revealed preference or SWB) are more reliable and should be preferred to stated preference techniques.
Revealed preference	Inconsistent consumer behaviour in comparable markets or natural experiments may signal the presence of potential distortions.	Field trials offer good prediction of consumer behaviour in alternative decision environments.[54] They can also be used to calibrate structural models to capture supply-side responses and dynamic effects.	Controlling for confounding factors, a comparison of consumer behaviour before and after intervention can be used to assess the efficacy of the intervention.
Subjective wellbeing	Where data is readily available, SWB offers a quick assessment on	The SWB effect of a field trial may not be easily captured by existing	Controlling for confounding factors, a comparison of SWB

[53] These use cases form the FCA's decision-making framework. See FCA (2017a).

[54] For example, see Adams et al (2015) and Adams et al (2016).

	whether consumer choice is optimal.	surveys. However, in some cases the likely SWB impact can be estimated based on existing information.[55]	before and after intervention can be used to evaluate the efficacy of intervention, providing they are adequately captured by surveys.

Note: This is the same table as Table 1 shown in Chapter 1.

Identification and diagnosis of harm

The previous section highlighted a few indicators that may suggest we as consumers are making systematically poor decisions due to information asymmetry and behavioural distortions. To further assess whether this is the case (which may warrant regulatory intervention), a policy maker can study the alignment between actual choice and counterfactual choice based on assumed true preferences.

The SWB approach discussed above may be well suited for decisions that have significant consequences: where survey information is available, measuring the SWB of consumers after they have used the product can offer a quick way of identifying significant losses of SWB. To assess the impact of a financial product on the SWB of consumers, the usage of the product must be captured by a SWB survey (eg the Understanding Society survey, the Wealth and Assets Survey (ONS), or the Financial Lives survey (FCA)).[56]

Where available, observed consumer behaviour in comparable markets or natural experiments can also provide clues as to whether behavioural distortions may be present in the market of interest (eg the add-on GAP insurance example discussed earlier).

Lastly, stated preference techniques such as the DCM may help a regulator understand whether a particular product feature (or a combination of features) is confounding consumers. However, care should be taken to consider whether stated preference provides a better reflection of a consumer's true preference than actual behaviour given the known issues associated with these techniques (see Table 4 for discussion).

Ex-ante remedy appraisal

Randomised control trials (RCTs) are considered by many to be a highly robust way to isolate the effect of an intervention from other confounding factors. For this reason, field trials are often preferred as a method for assessing behavioural change and the associated benefits that can arise from interventions.

Where field trials are not an appropriate tool (see FCA (2018a) and the discussion in the next section), a policy maker may seek to identify comparable markets or natural experiments in which consumers make better choices. They can then use this as the basis for estimating the benefits of imposing a similar decision environment on the market of interest. However, comparable markets and natural experiments are unlikely to be available for many markets of interests.

Turning to the use of SWB measures, the existing surveys of SWB may be unsuitable for appraising remedies if the SWB of individuals affected by the remedy is not captured or

[55] In considering the affordability rules on mortgage lending (FSA, 2012) and the price caps on high-cost short-term credit (FCA, 2014), the FSA/FCA used the SWB approach to inform the likely well-being impact of the proposed interventions.

[56] See Annex 1 for the survey questions in Understanding Society that relate to the use of financial products.

cannot be inferred from existing data.[57] Alternatively, a policy maker may attempt to capture the SWB of individuals participating in field trials (eg via a survey). This approach would suffer from the same time and participation constraints that field trials are subject to.

Lastly, while DCM can be used to predict behaviour when a particular feature of the product changes, the understanding of how DCM can be used to predict behaviour when the decision environment changes is more limited. In any case, a number of known biases associated with stated preference techniques should be carefully managed including loss aversion and hypothetical bias.

It is worth noting that all of the techniques discussed above typically capture only a static response from consumers in the decision environment; the supplier response is often not tested. As such, they are unlikely to capture the full impact of the intervention over time. Where a policy maker has good reasons to believe that the dynamic effects arising from an intervention will be strong, these need to be considered when assessing the costs and benefits of intervention.

One option is to simulate the various remedy scenarios using a structural model that has been calibrated with likely consumer responses (collected through one of the techniques discussed above). These models attempt to capture the dynamic effects of the remedy scenario by modelling the responses from of suppliers and consumers. The predictive powers of these models depend on the realism of assumptions made regarding the behaviour of suppliers and consumers, and the quality of the data used to calibrate this behaviour.

Ex-post policy evaluation

To estimate the impact of a policy already implemented, a policy maker can compare the behaviour of consumers before and after the intervention (controlling for other factors and accounting for supply-side response). Where data on consumer behaviour is available, this revealed preference approach is likely to be the most direct and common form of ex-post evaluation.

Alternatively, or in conjunction with the above, a policy maker can estimate the effect of the intervention on consumers' SWB. This would require the individuals affected by the intervention to be identifiable from existing surveys.

General consideration: product characteristics

Some of the approaches discussed in this paper are particularly apt for assessing the choices of products with certain characteristics. Table 7 below summarises the author's current understanding, followed by more detailed discussions around each type of products.

Table 7: Product characteristics and valuation approach

Product characteristic	Examples	Valuation approach
May have significant adverse and non-financial consequences	Mortgages and debt products (high-cost short-term credit, credit cards)	Assess the potential impact of adverse effect on individuals through the use of SWB

[57] In FSA (2012) and FCA (2014), the FSA/FCA used regression discontinuity designs to infer the SWB of individuals who would have been affected by the remedy proposal.

Opaque information, or likely to be purchased in times of stress, impulsion, or inattention, such that decision is likely to be distorted or ill-informed	Add-on products, easy-access credit, pensions	Use reveal preference purification to lessen the impact of behavioural distortions
Multiple attributes and fees that are likely to confuse/obfuscate consumers	Packaged current accounts, mortgages, general insurance, investment funds	Use choice modelling to assess the WTP with respect to each product attribute or outcome, in a transparent choice environment
Few purchase opportunities and feedback, such that consumers may not be able to recognise all potential outcomes	Pensions, long-term mortgage products, investment funds, health insurance	Use choice modelling to assess preference over outcome scenarios given the costs of products

For financial products that may lead to significant adverse effect beyond direct financial losses, such as stress caused by being in persistent debt, measuring SWB can capture the overall (financial and non-financial) impact of such decisions on SWB. These financial products include retail lending products such as mortgages, payday loans and credit cards, where the failure to keep up with repayment can cause significant anxiety and stress, as well as further financial losses. They can also include high-risk investment products where consumers do not appreciate the risk of losing their capital. The FSA/FCA had used SWB analyses to inform its policies around restricting mortgage lending for high-risk borrowers (FSA, 2012) and capping the prices of payday loans (FCA, 2014).

In cases where the purchase is made with incomplete information, or in times of stress, impulsion, or inattention, consumers can make decisions that are more likely to be distorted or ill-informed. Among others, add-on products, easy-access credit, and pensions are potential candidates for such products. Preference purification is a potential approach for assessing the scale of harm and the potential benefits of regulatory intervention, by examining consumer behaviour in alternative decision environments.

For products with multiple attributes and fees that are likely to confuse consumers, such as packaged current accounts, mortgages, general insurance, and investment funds, the use of DCM could be a way to assess the consumers' WTP with respect to each product attribute or outcome, and whether they are consistent with actual behaviour.[58]

Finally, for products that offer few purchase opportunities, span over a long time horizon, and provide limited performance feedback, a policy maker may attempt to elicit true preferences over eventual outcomes through the use of DCM (eg retirement income). This approach removes the cognitive burden of translating product features to eventual outcomes, and therefore reduces the potential for poor decisions. Pensions, long-term mortgages, and investment funds are examples of such potential candidates.

General consideration: costs to firms, consumers and the FCA

In choosing how to appraise the potential benefits of policy intervention, a policy maker would take into consideration the time and costs associated with the assessment of the

[58] However, as previously noted, supplementary evidence or prior knowledge may be required to support the claim that stated preferences inferred from DCM are more reflective of true preferences than the preferences revealed by consumers' actual behaviour.

policy proposal for all affected parties, and whether they are proportionate to the likely impact of the policy proposal. Experimental design, execution, data collection, data cleaning, and data analysis are all important elements to the cost of policy appraisal, and may affect the choice of approach to be undertaken.

Conclusion

Estimating the extent to which, as consumers, our decisions are failing to serve our best interests, and the extent to which regulatory intervention can address such problems, can be a challenging task for regulators. This is particularly so when our preferences are ambiguous. Paternalistic judgements are required, depending on the specific circumstances of the policy question.

All of the techniques currently available to assess choice suffer from various implementation, data availability, and resource issues. However, used appropriately and in combination with each other, these techniques can provide a more complete picture for the policy maker, and aid the formation of regulatory interventions that benefit consumers.

Annex 1: Understanding Society survey

Understanding Society, which builds on the British Household Panel Survey, is the largest longitudinal survey in the UK containing a broad range of subjective well-being questions.[59] Members of around 40,000 households are surveyed each year. Data collection for each wave takes place over a 24-month period, resulting in overlapping waves, and individual respondents are interviewed at around the same time each year.

A number of modules and questions may be particularly relevant for assessing financial decisions, including Financial Strain, Material Deprivation, Child Deprivation, Pensioner Deprivation, Household Finances, Personal Pensions, Savings, and Retirement Planning. Note that not all modules are contained in every wave of the survey; some are included in every other wave.

Table 8 below provides a non-exhaustive list of questions contained in the Understanding Society survey that relate to the use of certain financial services, or consequences relating to the use of certain financial services.

Table 8: Questions relating to SWB and the use of financial services

Module	Question	Sampling universe	Values
Household level information			
Household	Amount borrowed at purchase: mortgagee	mortgage/shared ownership at new address or mortgaged/shared ownership since previous wave	Amount in £
	Years left to pay: mortgage	mortgage/shared ownership at new address or mortgaged/shared ownership since previous wave	Number of years
	Type of mortgage	mortgage/shared ownership at previous wave and still the same or mortgage/shared ownership now	Repayment mortgage or loan/endowment mortgage/part repayment and part endowment/interest only/part interest only and part repayment/flexible mortgage/others
	Taken out additional mortgage on home	mortgage/shared ownership at previous wave and still the same or mortgage/shared ownership now	Yes/No

[59] https://www.understandingsociety.ac.uk/

	Total amount secured against property	mortgage/shared ownership at new address or mortgaged/shared ownership since previous wave	Amount in £
	Problems paying for housing	In mortgaged or rented accommodation, not rent free	Yes/No
Individual level information			
Self-completion satisfaction	Satisfaction with life overall	Agreed to self-completion module	Scale of 1 (completely dissatisfied) to 7 (completely satisfied)
Pension drawdown	Has a pension pot eligible for drawdown?	Aged 50 or over	Yes/No
	Has drawn down pension in last 12 months?	Aged 50 or over, and has pension eligible for drawdown	Yes/No/Not currently eligible to withdraw money
Household finances	How well would you say you yourself are managing financially these days?	All	Living comfortably/doing alright/just about getting by/finding it quite difficult/finding it very difficult
	Looking ahead, how do you think you will be financially a year from now?	All	Better off/worse off/about the same
Retirement planning	Have employers pension scheme	Aged 45, 50, 55, 60 or 65 and not retired or of pensionable age and less than 71 years and does not consider self retired	Yes/No
	Have private pension scheme	Aged 45, 50, 55, 60 or 65 and not retired or of pensionable age and less than 71 years and does not consider self retired	Yes/No
	Have any other retirement income	Aged 45, 50, 55, 60 or 65 and not retired or of pensionable age and less than 71 years and does not consider self retired	Yes/No

	Source of retirement income	Aged 45, 50, 55, 60 or 65 and not retired or of pensionable age and less than 71 years and does not consider self retired	Various sources
	Expected ratio of post to pre-retirement income	Aged 45, 50, 55, 60 or 65 and not retired or of pensionable age and less than 71 years and does not consider self retired	Less than a quarter/about a quarter/about a third/about a half/about two thirds/about three quarters/about the same as before retiring/have not thought about it
	Adequacy expected retirement income	Aged 45, 50, 55, 60 or 65 and not retired or of pensionable age and less than 71 years and does not consider self retired	More than enough to meet needs/just about enough to meet needs/less than enough to meet needs
Personal pension	Whether contributes to personal pension	All	Yes/No
	Stakeholder or other personal pension	Contributes to a personal pension scheme	Personal pension/stakeholder pension
	Date joined personal pension scheme	Contributes to a personal pension scheme	Date. If more than one personal pension then take the longest membership
	Contributes regularly to pension?	Contributes to a personal pension scheme	Never/regularly/irregularly/have stopped contributing to scheme
	Pension amount contributed	If contributes regularly to a personal pension scheme	Amount usually contributed
	Pension period covered	If contributes regularly to a personal pension scheme	Various time periods ranging from one off, less than one week, to one year.
Wealth, assets and debt *	Which savings accounts do you have?	All	Savings or deposit accounts/National Savings Accounts/Cash ISA/Stocks and Shares ISA/Premium Bonds/Others
	Amount held in accounts (for each account)	Has savings account(s)	Amount in £
	Has store cards/credit cards in sole name	All	Yes/No

	Repayment behaviour of cards in sole name	Holds credit cards in sole name	Usually have nothing to pay/Always/usually pay the full amount owning/Usually pay more than the minimum amount but not the full amount owning/Usually pay he minimum on some cards and pay more on others/Always/usually pay the minimum amount only/Sometimes am not able to pay the minimum amount/Other arrangement
	Balance outstanding of cards in sole name	Holds credit cards in sole name and pay less than the full amount each month	Amount in £

*Source: Understanding Society Survey, Mainstage wave 9. *The module Wealth, assets and debt is undertaken every 4 years and has so far only been included in wave 4 and wave 8 of the survey.*

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12 Endeavour Square, London E20 1JN
Telephone: +44 (0)20 7066 1000
Website: www.fca.org.uk