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Measuring the impact of alcohol multi-buy promotions on consumers' purchase behaviour

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ABSTRACT

The objective of this study was to understand the impact of alcohol multi-buy promotions on individual's purchasing behaviour. Our study deployed a Stated Preference survey to measure consumers' potential responses towards price changes and the introduction of promotions, as well as the resulting effects on demand. A series of econometric models were developed, ranging from simple selection models to advanced multiple discrete-continuous extreme value (MDCEV) models, to capture the discrete and continuous feature of alcohol purchasing choice behaviour. The model results were compared and then extrapolated to a series of policy scenario tests, to enable the evaluation of factors that underpin consumers' alcohol purchasing behaviour. This research contributes to evidence on the role of multi-buy promotions on alcohol purchasing behaviour, as well as adding to recent developments in the choice modelling literature by providing a comparison of results across a range of different model structures suitable for the analysis of data such as used here.

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1. Introduction

Excessive alcohol consumption is a major cause of ill-health and mortality and is also associated with economic and social harm. The Department of Health in the UK has estimated that the harmful use of alcohol costs the National Health Service (NHS) approximately £3.5 billion per year and 7% of all hospital admissions were alcohol related¹ in 2009–2010. The [Government Alcohol Strategy report \(2012\)](#)² stated that the cost of alcohol related harm is estimated to be £21 billion annually.

Alcohol pricing is considered by some to be a potential means of influencing levels of alcohol consumption ([Anderson et al., 2009](#); [Purshouse et al., 2010](#)). However, alcohol pricing is a sensitive policy issue, with those in favour of price regulation arguing that it has the potential to reduce harms from overconsumption of alcohol, and those against emphasising the need to limit the impact on those who drink alcohol in moderation.

In this study, we examine the impact of one aspect of pricing – multi-buy promotions – on consumers' purchasing of alcohol for consumption off the premises where the purchase was made. By multi-buy promotions, we refer specifically to promotions where there is a link between the number of products purchased and the price of the product, for example 'two

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¹ Nakamura et al. (2014).

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224075/alcohol-strategy.pdf.

for the price of one', 'three for the price of two' or the purchase of more than one item for a fixed price discount. The study was carried out under considerable time pressure between September 2012 and January 2013 in order to inform the impacts of proposed policy to ban alcohol multi-buy promotions.

We contribute to the empirical literature on better understanding alcohol purchase behaviour under multi-buy promotion in three ways. First, we deploy a novel data collection approach to measure consumers' stated alcohol purchases under different market changes which are not easily observed in the real market. Second, a series of econometric techniques ranging from the Tobit and Heckman models to advanced MDCEV models are developed to explain the discrete – continuous nature of alcohol purchasing behaviour. This is, to the best of our knowledge, the first time that MDCEV models have been used for interpreting consumers' alcohol purchase behaviour. Third, the results are then used in a series of policy scenario tests, which help to gauge the potential impact of removing alcohol multi-buy promotions.

The remainder of the paper is organised as follows. Section 2 briefly describes the design of the stated preference survey and the data collection more widely. Section 3 summarises key literature regarding econometric models that predict discrete–continuous choices with a special emphasis on the comparison of these models. Section 4 discusses the estimation of the econometric models. Section 5 presents a series of policy scenario tests, followed by Section 6 which concludes the paper with the discussion of the policy implications and future work.

2. Data description

2.1. Stated preference survey design

Given the limitations of available retail measurement data (lack of detail on consumers, and limited information on promotions), an online survey was designed to collect self-reported information on existing patterns of alcohol consumption and purchasing. This included a stated preference component to examine potential responses to alcohol promotions under different market situations, including multi-buy promotions. Stated choice techniques have been widely used in marketing, environmental science, transport demand analysis and the health sector (Louviere, et al., 2000). Within the survey, each respondent was presented with a number of hypothetical scenarios, with different alcohol prices and with/without the multi-buy promotions for six types of alcohol, and asked to indicate which types of alcohol they would purchase and the volumes of each they would purchase.

For realism, respondents were asked to consider purchases that they made themselves (for themselves and their households where relevant). To avoid excessive incidence of zero expenditure, we asked respondents to consider their likely purchases over the following four week period. This was also important in the context where we wanted to explore the impact of multi-buy offers on purchasing, which puts an emphasis on cross-product substitution, requiring respondents to imagine a situation in which they were making a number of purchases (and ideally multiple purchases).

Three types of alcohol were included in the choice scenarios: wine, beer/cider and spirits, using generic brands, with wine and beer quality reflected through different price ranges. Three types of multi-buy promotion were tested for each alcohol type, as outlined in Table 1.

Although the primary aim of the research was to model the specific impact of alcohol multi-buy promotions on purchasing behaviour, it was also important for validation of the model to estimate an accurate price sensitivity. With this in mind, we included some choices with price differences only (and no promotions) and some choices with promotions. Respondents were therefore asked to participate in two sets of scenarios, with 12 choice tasks in total. The first four choice scenarios involved choices between non-promotion items, with alternatives varying in price only, while the second set of eight choice scenarios included non-promotion items and promotion items for some alcohol types. All choice tasks included the non-promotion versions of each of the six products (three types of wine, two types of beer and spirits). In the scenarios with promotions, one promotion on wine and one promotion on beer were included in each choice task, where these always applied to just one product within a category (so e.g. no joint promotions for wine A and wine B). In half of the scenarios, a promotion on spirits was included (with one of two types), while in the others, spirits were not on promotion.

The first choice task reflected a scenario where all alcohol types were present, at baseline prices, with no promotions.

Table 1

Alcohol alternatives and promotions included in the survey.

Alcohol type	Quality differentiation	Promotion type
Wine (750 ml/bottle)	1. Wine A – (less than £5) 2. Wine B – (£5–10) 3. Wine C – (more than £10)	1. 3 for a fixed price discount (70/80/90% of the fixed price) 2. 3 for 2 3. 2 for 1
Beer	1. Beer A – (440 ml /can, around £1/can) 2. Beer B – (330 ml /bottle, around £2/bottle)	1. 12 for a fixed price discount (70/80/90% of the fixed price) 2. 12 for 8 3. 8 for 6
Spirits (750 ml/bottle)		1. 2 for a fixed price discount (70/80/90% of the fixed price) 2. 3 for 2

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