Institution: University of Glasgow (UofG)		
Unit of Assessment: UoA 17 Business and Management Studies		
Title of case study: Increasing financial recoveries using insights from behavioural economics: A co-designed intervention with NHS Scotland		
Period when the underpinning research was undertaken: 2013–2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
(1) Sayantan Ghosal (2) Theodore Koutmeridis	(1) Adam Smith Chair in Political Economy (2) Senior Lecturer	(1) 2013–present (2) 2016–present
Period when the claimed impact occurred: 2016–2020		
Is this case study continued from a case study submitted in 2014? No		

1. Summary of the impact

Incorrectly claimed payment exemptions for dental and ophthalmic treatments cost NHS Scotland approximately GBP10 million annually. From 2016 onwards, UofG researchers developed an award-winning collaboration with NHS Scotland to increase financial recoveries. Based upon theoretical and empirical research, they co-designed 'frames' that were embedded in letters requesting voluntary payments for incorrectly claimed exemptions, replacing the threat of a penalty charge. This initiative: (i) supported increased cash recoveries of over GBP580,000 during the initial intervention phase; (ii) resulted in changes to NHS Scotland's practice and culture (e.g. more robust planning and evaluation of interventions; the long-term adoption of experimental methods inspired by behavioural economics). In turn, this activity has underpinned: (iii) successful spinout projects and sustained financial recoveries.

2. Underpinning research

2.1. Context

Traditional economic theory assumes that decision makers are rational: they are logical, objective and have sufficient means to reach identified ends. Behavioural economics does not make this assumption. It instead assumes that decision makers attempt to make rational decisions, but do not always do so due to factors such as limited information, limited means or cognitive bias. These decisions are not irrational, but 'boundedly rational'. The framing effect is an example of cognitive bias whereby people decide on an option based upon the way in which information is presented, and whether the options presented are perceived in a positive or negative light. That frames can impact on decision-making is a key insight of direct relevance from the seminal behavioural economics research carried out by Kahneman and Tversky.

2.2. Theoretical research

In 2016, Ghosal (with Dalton, Tilburg University, and Mani, University of Oxford) **[3.1]** conducted a highly-influential study in terms of setting out the conditions of successful policy interventions. It explored a range of policy interventions that can raise the welfare levels of boundedly rational decision makers to the same levels as rational decision makers. The research developed a theoretical framework to show that exposure to positive stimuli could reduce behavioural bias by helping decision makers to recognise the link between their current efforts and future aspirations.

In 2018, Ghosal (with Dalton) focused on frames that influence, and adapt to, behaviour over time (so become self-fulfilling) **[3.2]**. An example of a self-fulfilling frame could be where the presumption of wrongdoing, and immediate threat of a penalty charge or fine, leads to poor returns in terms of fines being paid—the negative framing of the information influences behaviour, thus shaping the outcome. The research set out the conditions under which frames (and more broadly, default choice architecture) are self-fulfilling, and worked out the welfare implications of such frames.

2.3. Empirical research

In 2019, Ghosal *et al* analysed and reported evidence from a randomised control trial that altered frames in order to mitigate mistakes in decision-making within a vulnerable, stigmatised population **[3.3]**. A key premise was that these individuals were able to forecast the short-run consequences of their actions (e.g. more money in the short-term through not paying a fine) but

not the medium or long-term consequences (e.g. having to pay a statutory penalty charge eventually). The findings demonstrated that designing frames within this context could impact on choices and behaviour in the medium term, as those who participated in the program exhibited improved self-efficacy, a greater sense of agency and willingness to invest in the future.

2.4. Key findings

The key findings from this body of research are that by recognising conditions where self-fulfilling frames underpin negative results **[3.2]**; and establishing conditions that raise the aspirations of decision makers (by linking current efforts to future aspirations) **[3.1]**; frames can be used to influence behaviour in the absence of using an explicit monetary disincentive, such as a penalty charge or fine **[3.3]**. These findings have underpinned a pioneering collaboration between UofG researchers and NHS Scotland Counter Fraud Services.

Ghosal's unique contribution is the combination of theoretical and empirical findings, which established the conditions for successful interventions and provided the justification for using frames in such initiatives. Koutmeridis' research **[3.4]** (with Draca, University of Warwick, and Machin, London School of Economics) examined the determinants of unlawful and illegal behaviour. Koutmeridis' experience in conducting empirical research within this context informed the design of the frames and the data collection methods deployed in this successful collaboration.

3. References to the research

3.1 Dalton, P. S., Ghosal, S. and Mani, A. (2016) Poverty and aspirations failure. *Economic Journal*, 126(590), pp. 165-188. (doi: 10.1111/ecoj.12210)

3.2 Dalton, P. S. and Ghosal, S. (2018) Self-fulfilling mistakes: characterization and welfare. *Economic Journal*, 128(609), pp. 683-709. (doi: 10.1111/ecoj.12409)

3.3 Ghosal, S., Jana, S., Mani, A., Mitra, S. and Roy, S. (2020) Sex workers, stigma and self-image: evidence from Kolkata brothels. *Review of Economics and Statistics*, pp. 1-45 (Accepted for Publication). (doi: 10.1162/rest_a_01013)

3.4 Draca, M., Koutmeridis, T. and Machin, S. (2019) The changing returns to crime: do criminals respond to prices? *Review of Economic Studies*, 86(3), pp. 1228-1257. (doi: 10.1093/restud/rdy004)

The underpinning research meets the 2* threshold because outputs **[3.1]**, **[3.2]**, **[3.3]** and **[3.4]** are published in international double-blind peer-reviewed economics journals.

4. Details of the impact

4.1. Baseline context

Exemptions from payment for dental and ophthalmic treatments cost NHS Scotland approximately GBP75 million per annum. Approximately 1.4 million exemption claims are made each year from approximately 6 million total patient contacts. NHS Counter Fraud Services have historically checked 50,000 claims per annum; the estimated fraud/error rate is around 14% with annual losses to NHS Scotland of approximately GBP10 million.

4.2. Pathways to impact

In order to tackle this issue, in June 2015 and February 2016 initial knowledge exchange workshops were held between the UofG, NHS Scotland, the Glasgow Centre for Population Health, Scottish Government and the Royal Society of Edinburgh. These workshops were followed by face-to-face meetings between Ghosal and a Senior Counter Fraud Specialist from NHS Scotland. Ghosal was subsequently invited to present his research at the NHS Scotland Counter Fraud Network Meeting in November 2016 (confirmed by invitation **[5A]**). At this presentation, Ghosal set out how his research on self-fulfilling frames could be used to influence behaviour in lieu of threatening a penalty charge or fine (confirmed by slides **[5B]**). This led Senior NHS managers to invite Ghosal to collaborate in the co-design of a new intervention for incorrectly claimed exemptions for payment of charges for dental and ophthalmic treatments.

4.3. Co-designing an intervention

NHS Scotland's 'business as usual' process for incorrectly claimed exemptions previously involved a letter initiating a penalty charge after 30 days of non-payment. In contrast, the intervention involved eligibility checks being undertaken on all claims received within a period of 4-8 weeks, followed by a written request for voluntary payment of the charges without the threat of a penalty charge. The written request took one of three different formats, corresponding to three co-designed frames (which were tested on 6,000 patients). The sample was split into equal cohorts with letters adopting one of three frames: (i) a 'social welfare' frame, which emphasised that wrongly claimed exemptions can divert money from NHS patients; (ii) a 'neutral' frame; or (iii) a 'consequences' frame, which stated that claimants' future treatment activities may be monitored. In each letter, patients were asked to pay for their treatment, and in future to ensure that they were entitled to claim exemptions before doing so.

Ghosal, Koutmeridis and the Senior Counter Fraud Specialist from NHS Scotland then drafted an NHS document seeking approval for the initiative. The document **[5C]**, which directly cites the underpinning research **[3.1**, **3.4]**, demonstrated how NHS Scotland could use the empirical data collected to take the initiative forward in the long term. The approval and subsequent implementation of this initiative by NHS Scotland was the first evidence of actual change, marking the first time that NHS Scotland Counter Fraud Services had incorporated insights from behavioural economics in their activities. This was supported by NHS Scotland funding of GBP60,000.00 to back the collaboration in 2017 (confirmed by email **[5D]**).

4.4. Increased financial recoveries

The Senior Counter Fraud Specialist, NHS Scotland, confirms that, *'the support that Professor Sayantan Ghosal provides to NHS Scotland has a real, positive financial impact.'* (statement **[5E]**). From September 2017 onwards, batches of letters utilising the new frames were sent out at weekly intervals. In the first seven weeks, 7,800 letters were issued and GBP109,330.00 was collected as a result (confirmed by data **[5F]**). This was achieved without the threat of a penalty charge, using letters incorporating the three co-designed frames. The Senior Counter Fraud Specialist, NHS Scotland, further underlined the economic impact of the initiative: *"In general terms we are very happy to be receiving over £100,000 per month, which is almost five times our previous monthly income."* In a subsequent email, the Senior Counter Fraud Specialist, NHS Scotland, confirmed that cash recoveries from patients found to have incorrectly claimed exemption were GBP935,841.71 for 2017/18 (including the six-month intervention). The comparative figure was GBP355,301.95 for 2016/17 (pre intervention), which represents an increase of GBP580,539.76 (confirmed by collated emails **[5G]**)

4.5. Changes to NHS Scotland's practice and culture

In March 2018, NHS Scotland's business as usual letter was modified to incorporate the 'social welfare' frame as standard. Although all of the co-designed frames worked successfully, the 'social welfare' frame was selected over the 'consequences' frame as it was perceived more positively:

> *'Most people pay for their dental treatment unless they qualify for exemption. Only a minority in your area wrongly claim exemption, diverting money away from patients like you who rely on NHS healthcare. Make sure you are not one of them.'* **[5H]**

The incorporation of the 'social welfare' frame into the business as usual letter entails that improved cash recoveries will continue in the long term. As a direct result, this pioneering collaboration was awarded an NHS Scotland Excellence in Innovation and Efficiency Award in 2019. NHS Scotland Counter Fraud Services was also named Team of the Year at the UK Government Counter Fraud Awards that same year (confirmed by collated evidence **[5I]**).

The Senior Counter Fraud Specialist, NHS Scotland, also confirms changes to institutional culture based upon the collaboration with UofG researchers: *'We have been coached by Sayantan [Ghosal] to develop a research culture where the impact of our fraud prevention interventions can be measured, repeated and the results withstand scrutiny. The importance of controlling variables is now commonly understood within my team'.* He added: *'following on from this campaign we worked with our IT supplier to create an editable field in our 'business as usual' letter. We hope to start soon with experiments to test the effectiveness of different*

message frames to engage more people with our normal statutory recovery process without resorting to fines, penalties and higher cost of administration.' (statement **[5E]**).

The adoption of these experimental methods by NHS Scotland Counter Fraud Services has underpinned subsequent initiatives and procedural changes. For instance, based upon consultation with Ghosal and Koutmeridis, an automated telephone payment line was introduced in order to remove the 'process friction' that occurs in debt-recovery telephone conversations. For these reasons, ongoing financial recoveries cannot solely be attributed to the co-designed intervention. What can be confirmed is that, from July 2019 to March 2020, 17,245 letters incorporating the 'social welfare' frame were sent out (prior to activities being suspended by COVID-19). In terms of financial recoveries, the available data covers the period from September 2019 to December 2019, in which the total recoveries were approximately GBP330,000.00 (which would equate to approximately GBP990,000.00 per annum). These figures suggest that increased financial recoveries are sustained at a similar level to the original intervention period (confirmed by collated evidence **[5J]**).

4.6. Spinout interventions

Based upon the principles of this initiative, Ghosal and Koutmeridis have embarked on new collaborations with NHS Scotland Counter Fraud Services. Firstly, Operation Lugano designed a frame to be embedded in a letter to be sent to ophthalmologists to check patient eligibility when exemption claims are first made. From December 2019 to February 2020, a three-month pilot intervention recorded 516 fewer claims (in comparison with the same time period the previous year) with a value of GBP30,671.00 (confirmed by data **[5K]**). The Senior Counter Fraud Specialist, NHS Scotland, confirms that, *'early indications suggest that savings have been realised and when annualised create a cost savings ratio of more than 1:1000 for the £1000 cost of postage.'* (confirmed by statement **[5E]**).

The second initiative, Operation Como (originally due to begin in April 2020 but delayed by COVID-19) was set to adopt the same principles by sending 1,000 letters to dental practices, where spending is significantly higher than ophthalmic practices. Predictions based upon previous interventions suggested that this could prevent losses of up to GBP100,000 per annum (confirmed by statement **[5E]**). The Senior Counter Fraud Specialist, NHS Scotland, adds that, *'the next phase of our activities in tackling this area of loss is to investigate whether it is possible to increase the options to include something like a small loan from a credit union. This would be a really worthwhile area to explore and the knowledge that Sayantan [Ghosal] brings to this subject will be crucial in finding the best solution.'*

UofG research has, therefore, not only contributed to our understanding of an aspect of behavioural economics through a substantial empirical application, but has impacted on policy and practice by devising an intervention based upon its theories. This has realised significant financial recoveries for NHS Scotland, which can now be redistributed to support patient care.

5. Sources to corroborate the impact

[5A] Invitation to address NHS workshop (29 July 2016) ***[PDF available]***.
[5B] NHS workshop slides (November 2016), which cite the underpinning research (e.g. [3.2]) ***[PDF available]***.
[5C] Internal NHS document, 'Collaborative Research Proposal' drafted by a Senior Counter Fraud Specialist, NHS Scotland (which cites the underpinning research [3.1, 3.4] as underpinning the collaboration) ***[PDF available]***.
[5D] Email confirming NHS investment of approximately GBP60,000 ***[PDF available]***.
[5E] Statement from Senior Counter Fraud Specialist, NHS Scotland ***[PDF available]***.
[5F] Initial intervention data from NHS Scotland Counter Fraud Services (confirms cash recoveries of GBP109,330) ***[PDF available]***.
[5G] Collated evidence: (i) email from Senior Counter Fraud Specialist, NHS Scotland, confirms quote; (ii) subsequent email confirms cash recoveries of GBP935,841.71 for 2017/18 and GBP355,301.95 for 2016/17 ***[PDFs available]***.
[5H] New NHS Scotland letter (incorporates the 'social welfare' frame designed during the intervention) ***[PDF available]***.

[5I] Collated evidence: (i) Government Counter Fraud Awards (2019); (ii) email confirming NHS Scotland Excellence in Innovation and Efficiency Award (2019) ***[PDFs available]***.
[5J] Collated evidence: (i) NHS Scotland Counter Fraud Services Patient Exemption data (January 2017−December 2019); (ii) email from Senior Counter Fraud Specialist, NHS Scotland (19 November 2020) ***[PDFs available]***.
[5K] Operation Lugano data from NHS Scotland Counter Fraud Services (December 2019−February 2020) ***[PDF available]***.