RAISING THE STAKES

and other projects

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- Today we report on a stream of research commissioned by the Responsible Gambling Trust, employing data from The Rank Group, operator of Grosvenor casinos

- The research focuses on machine play and is therefore part of the RGT Machines Research Programme

- There are two principal projects:

  1. **what effects followed from the uplift in maximum stakes and prizes in casino (B1) machines introduced on January 1, 2014?** (DF, IM, HW)

  2. **more generally, what can we learn about the behaviour of slots players from analysis of tracked (loyalty card) data over an extended period?** (DF, IM)

UPLIFT

- The Triennial Review of Stake and Prize Limits (2013)

- Most controversy focused on B2 machines in bookmaker offices but here no changes were proposed

- However, a rise in stakes and prizes *was* approved for B1 machines, found in casinos, and took effect on January 1, 2014

  - maximum stake: **£2 → £5**

  - maximum prize: **£4,000 → £10,000**

  - linked progressive jackpot: **£4,000 → £20,000**

WHAT EFFECT DOES A LIMIT ON STAKES AND PRIZES HAVE?

- limits prevent *some* players from taking the level of risk which they would choose if unconstrained

- the role of money in gaming is to create suspense and for some players £2 (for example) is insufficient money placed at risk to make the experience exciting enough….they would like to include some bets above the limit in their gaming session

- these particular players will respond to a relaxation in the limit by spending more on machines (e.g. increase average stake size, switch to machines from other gambling, etc)

- to that extent, the industry expected a 'modest' increase in revenue….modest because, for most B1 activity, the constraint had not been binding…..the average stake per spin **before** Uplift **was below 80 pence**

- if players are responsible gamblers who are fully informed and in control of their play, the increase in revenue is 'a good thing' because it represents some individuals spending their money in a way more congruent with their preferences
- on the other hand, the whole rationale for stake limits is to protect the vulnerable from harming themselves- some of the increase in spending might come from players whose gambling is out of control
- stake and prize limits as a tool for mitigation of gambling harm are common in Europe but rare in the rest of the World and there are **no published studies of the efficacy of limits in addressing problematic gambling**

THE DATA: *we analysed two data sets*

- **casino-level data**: for each of 23 Grosvenor casinos, weekly series on house win on B1 machines, table games & e-roulette; total stakes on B1 machines; mean stake per spin

  (February, 2013- November 2014)

- **tracked data:** details of about 7.5m gambling visits to casinos by nearly 650,000 individuals over 2012-2014 (length of time playing machines, amount lost or won, information also on table games and e-roulette); for each individual, know age, gender and (via postcode) some details of neighbourhood where he or she lives

CASINO-LEVEL ANALYSIS

- we built a statistical model to account for variation in indicators (such as house win on B1 machines) at casino i in week t

- in the statistical model, the variables capture information <u>such as </u>whether the casino is in a city centre and the density of population in the surrounding area

- the type of model we use (*linear mixed model*) also calibrates the prediction to allow for systematic "unexplained" variation in the average level of business a particular casino does

- we entered into the model variables which captured whether the week in question was
  - before the changes took place,
  - during a two-week transition period in January, 2014 when the machines across the estate were being converted, or
  - under the new stakes & prizes regime
- essentially we are comparing business before and after the changes
- this sort of *event study* requires that the underlying time series are reasonably stable and have only one structural break in the period, coinciding with the intervention of interest
- we first checked that this condition was met, using *structural break analysis*

for example……..for the statistic mean stake per spin, the structural break identified was very sharp and coincided exactly with the roll-out of the new machine features
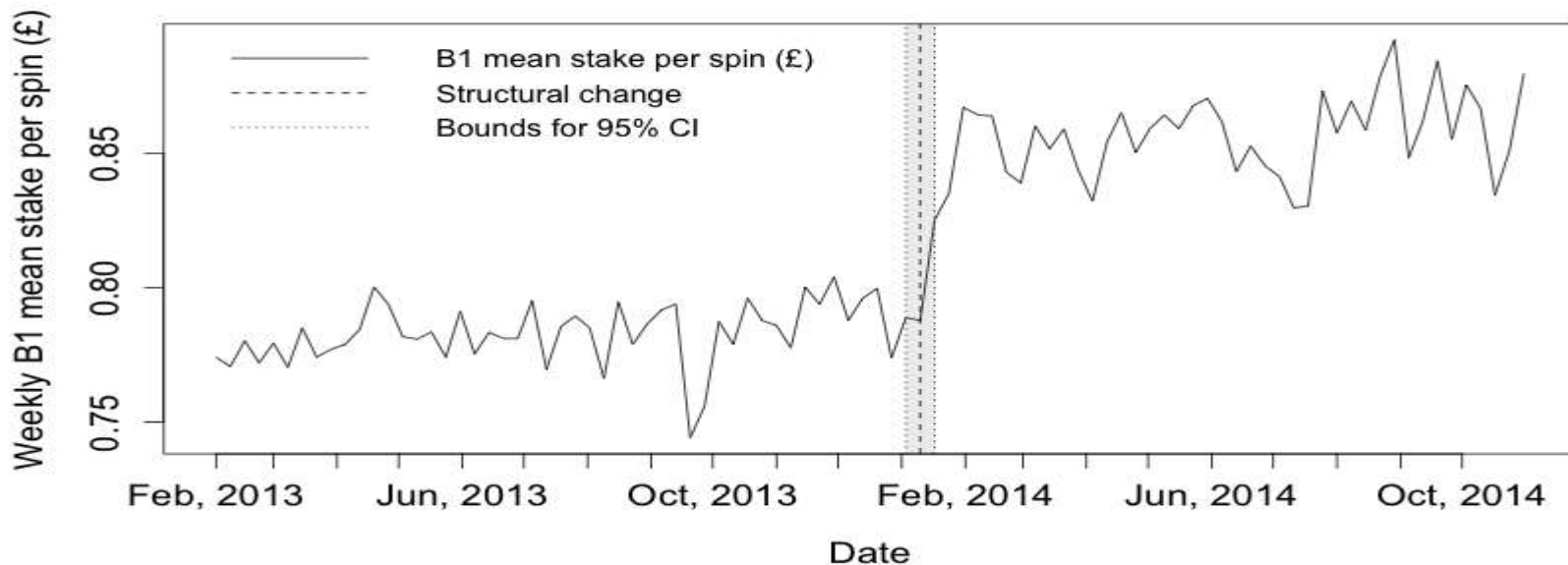
- for other series, such as house win, there was a lot of 'noise' in the data and the change in behaviour was not as obvious to the naked eye…but structural break analysis confirmed that a single 'event' had indeed taken place and before and after comparisons were valid

- **for house win from B1 machines, the analysis suggested a 7.1% increase following the uplift of maximum stakes and prizes**

- in the Consultation around the Triennial Review, the industry had predicted a 5% increase…..but annual growth in the previous two years had been 3.5%.......so industry predictions are borne out by our analysis

- amount staked went up proportionately more, by **10.2%**, implying an increase in payback rate
- this could have come about because the average win for a customer will have increased with average stake…..and the bigger the pay-out, the less likely is the player to recycle his or her winnings
- an increase in amount staked (here 10.2%) could in principle come from an increase in the number of spins *or* an increase in the average stake per spin *or* a mixture of the two
- in fact, the number of spins per week at an average casino increased only very marginally
- **so the extra turnover came almost entirely from the increase in average stake size…..which increased by 8.8%**

- all these results were invariant to casino type (city centre, deprived area, etc)
- but things were different when we applied the statistical model to house win from table games
- we classified 12 of the 23 casinos as being located in 'deprived areas' based on the official Index of Multiple Deprivation
- at these casinos **only**, Uplift was followed by a significant drop in house win from table games such that, to a substantial extent, **the increase in profit from machines represented cannibalisation of the casinos' table game business**
- we conducted the analysis according to whether the casino was in a deprived area but most of these casinos were in the North, so the result could represent a regional difference rather than a pure 'deprivation' difference
- either way, it suggests that some players who preferred machines had been at tables only because a £2 stake was insufficiently exciting…but a limit of £5 for some players in less affluent communities may offer as much excitement as they want
- more generally, the result casts doubt on the relevance of maximum stakes if players have ready access (in this case in the same premises) to gambling media with no such limits

ANALYSIS OF TRACKED DATA

- our unit of analysis was the *player-visit*

- we looked at about 7.5m visits by more than 640,000 card holders over 2012-2014

- we produced descriptive data on how spending levels etc varied for *all players* across the three years

- formal statistical modelling was focused on *regular users* who recorded eleven or more visits in each year

- in the last BGPS, the prevalence-rate of pgsi problem gambling was sixteen times as high among monthly-or-more slots players as among less-than-monthly slots players, so harm is likely to be *concentrated* among regular users

"ALL TRACKED PLAYERS"
2012, 2013, 2014

- about ¼ of visits included B1 play and about four-fifths of these were B1-only visits
- female visits were more likely to include B1 play
- the typical (median) player loss on a B1 visit was about £20 in each of the years
- but one-fifth of visits involved a loss of more than £100
- on B1-only visits, typical (median) length of time playing was about 50 minutes
- but in more than 5% of visits, more than 4 hours were spent on the machines

we compared changes observed from 2012-2013 with changes observed from 2013-2014

- for example we allocated each B1 player in each year to one of the categories:
  - new user,
  - infrequent user,
  - frequent user,
  - former user
- we looked at transition-rates between years: 2012→2013 gave us a baseline figure for (eg) what proportion of infrequent users one year become frequent users the following year; we then tested for whether there was a change in that proportion 2013→2014 (where new limits were in place in 2014)
- frequent users were defined as having at least 11 visits in the year (roughly monthly-or-more players)

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- in fact, there was **no difference** in the proportion of infrequent users progressing to frequent user status
- nor was there any sign of change in the rate at which new players were recruited
- **but there was a significant increase in the proportion of frequent players one year who stayed as frequent players the following year (60%→66%)**
- this is consistent with the increase in stake and prize limits having helped retain regular players- one possible scenario is that about one-third of regular players give up regular play each year and many may do so because they get bored- raising the stakes may have kept some of them interested

- median player loss on a B1 visit increased only marginally from 2012→2013 but sharply (£19.88 to £22.26) from 2013→2014
- the proportion of visits where **more than £200** was lost increased from 6% to 6.2% 2012→2013 but then from **6.2% to 7.5%** 2013→2014
- the proportion of visits where **more than 4 hours were spent on the machines** was unchanged from 2012 to 2013 but then increased **5.1% to 5.7%** 2013→2014
- among frequent users, spending in the bottom quartile of players ranked by loss actually fell in 2014 but in the top-quartile it increased by 14%
- **all these findings and others in the Report underline that the increase in industry revenue was disproportionately from heavy players (unsurprising because heavy players are probably more likely to have had their behaviour constrained by the old stake limit of £2)**

THE REGULARS: STATISTICAL MODELLING

We again employed a *linear mixed model*, this time to predict how much player i lost on visit t (also modelled time spent playing & frequency of visit)

The indicator of interest (eg £ loss) was specified to depend on:
- whether the new stakes-and-prizes regime was in place
- player gender
- player age
- whether the player's address was in a very deprived area
- whether the player also engaged in table games/ e-roulette
- whether the player ever engaged in late night visits
- whether the particular visit was a late night one
- the distance from home to casino

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- spend on a visit increased significantly post-implementation with some tendency for this effect to be less pronounced among older customers

- the increase was particularly sharp on late visits

- before implementation there was no significant difference in expected loss between those living in the most deprived areas and the rest- but the increase in expected loss after implementation was greater for those who lived in a very deprived area

example: 25 year old male predicted to lose £5.53 more post-implementation but £8.00 more if he lived in a very deprived area (and £11.79 more if he was also playing late at night)

- predicted time spent playing increased by about 4.5% after the changes took place but by only about 2% for a player living in a very deprived area

- frequency of visit was generally unaffected by the changes though older players tended to increase frequency and those living in very deprived areas tended to reduce frequency

- when higher stakes were in place, players tended to spend more money on each visit and this was especially so for residents of very deprived areas- but, to an extent, their extra spending per visit was mitigated by making fewer visits

- in contrast to the B2 project reported at last year's RGT conference, we had no access to the customers and therefore no evidence on which customers were experiencing harm from gambling

- evidence on the issue of harm from our analysis is therefore necessarily indirect; to facilitate the production of more direct evidence on gambling harm, we recommend future RGT research projects include access by researchers to a sample of customers in order to obtain information about harm

- we find that there was a modest increase in turnover from B1 machines

- this was **disproportionately from heavy players, from younger players, from late night play and from those living in the poorest areas** (caveat: we do not know whether the individuals were themselves poor)

- all the factors mentioned have been associated with an elevated tendency for play to be problematic

- this indicates that it might be prudent to match any liberalisation of rules on stakes and prizes with active harm minimisation measures in casinos

- many players will take advantage of their ability to create a more 'suspenseful' experience and spend more simply because it is more entertaining

- but allowing more fun needs to be tempered by positive action to guard against extra harm accompanying the extra fun

ANOTHER PROJECT

- in a still ongoing project, Ian McHale and I have a more general brief from the RGT to explore player behaviour from analysis of loyalty card data over 2009-2014

- we are focusing particularly on behaviour relating to items in the PGSI: chasing losses and gambling more heavily over time

- for example, we look to identify players who have a tendency to return to the casino sooner than usual the more they have lost on the previous visit
- we do this for six-month windows- rolling windows where a new six month window opens up each month
- this should enable us to learn about the persistence of chasing-losses (and other behaviours) over time and how many players move in and out of loss-chasing behaviour
- we will report in 2016