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The miracle of the markets: Identifying key campaign events in the Scottish independence referendum using betting odds

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ABSTRACT

This paper analyses campaign dynamics in the 2014 Scottish independence referendum by integrating time-stamped polling releases with highly granular evolving price data created by online political gambling markets. Our analysis models the relationship between poll releases and prices available on a Yes result, allowing us to measure the extent to which the release of each new poll represented an informational 'shock'. We then seek to control for polling shocks in order to isolate and analyse the effects of key campaign events; combining a multivariate time series analysis with confirmatory testing based on a micro-analysis of the movement in gambling prices in the minutes and hours following these events. We conclude that the second leaders' debate between Alex Salmond and Alistair Darling was the most influential event of the campaign, initiating a surge in the Yes side's estimated probability of victory.

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1. Introduction

The Scottish independence referendum represented a breakthrough in the popularity of political betting in the UK (Bienkov, 2014). Prices on the outcome were available from at least 17 gambling websites and just one of these, www.betfair.com, reported over £8.6 million in matched bets on the referendum (Thomas, 2014). This extensive betting activity generated information about the likelihood of referendum's outcome as estimated by gamblers while the campaign unfolded. Our aim in this paper is to leverage the dynamic nature and high level of temporal granularity provided by political gambling market data in order to identify the effects of both emerging polling information and key events on outcome likelihoods during the Scottish independence referendum campaign.

Even a cursory review of the Scottish independence referendum indicates that there was considerable in-campaign volatility. While the No camp had a strong initial lead and, ultimately, won by a margin of over 10% (Electoral Commission, 2014); in the weeks running up to the vote the polls narrowed and there was genuine uncertainty about which side would prevail. A shock YouGov poll, released on the evening of September 6 and published in 7 September's *Sunday Times*, put the Yes option in the lead. The 'Better Together' anti-independence coalition responded to this development with a hyper-active flurry of campaigning. The apogee of their rear-guard action was a written commitment to (among other things) extensive new powers for the Scottish Parliament signed by David Cameron, Ed Miliband and Nick Clegg. 'The Vow', as it became known, appeared late in the campaign; it was published in the *Daily Record* on 16 September, 2014.

As such, it does not seem inappropriate to suggest that the volatility of the Scottish independence referendum campaign generated political commitments that will affect the constitutional politics of Great Britain for years to come. In the light of the 2015 UK general election result, which saw the SNP securing 56 out of 59 available Scottish seats in Westminster, it is also difficult to avoid the conclusion that the campaign altered the face of UK electoral politics. Finally, the campaign has relevance to contemporary and potential future developments in UK and Scottish politics. Although Alex Salmond famously described the 2014 vote as a 'once in a generation opportunity', Nicola Sturgeon was quick to assert that a second Scottish independence referendum is 'very much on the table' following the UK's EU membership referendum on 23 June, 2016.

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All of these considerations point to the substantive importance of understanding how the Scottish independence referendum campaign unfolded. More generally, the Scottish independence referendum is part of an international trend of increased use of direct democracy as a means of resolving constitutional questions in consolidated democracies (International IDEA, 2008; Peters, 2016; Scarrow, 2001, 2003). There is growing evidence supporting the idea that campaigns exert greater influence over the result of referendums than other types of elections (Hobolt, 2009; Laycock, 2013; LeDuc, 2002; de Vreese, 2007; de Vreese and Semetko, 2004; Schuk and de Vreese, 2008). This is because role of the 'fundamentals' of partisanship and economic performance can be occluded in referendum campaigns by a combination of the complexity of the issues at stake and cue uncertainty. It follows that referendums are electoral events characterised by a relative paucity of information accounting for the evolution of public preferences. As such, the data and techniques developed in this article are particularly apposite for scholars interested in better understanding referendum campaigns.

However, this doesn't represent an insurmountable obstacle to the extension of the type of data collection and analytic techniques employed in this paper to parliamentary or presidential elections. Indeed, a range of papers have already used political gambling markets to trace campaign dynamics in presidential and parliamentary elections (Arnesen, 2011; Forsythe et al., 1998; Shaw and Roberts, 2000; Wolfers and Leigh, 2002). Furthermore, there is broad consensus in the contemporary literature around the assertion that campaigns can affect the outcomes of parliamentary and presidential elections (see, for instance: Arceneaux, 2005; Box-Steffensmeier et al., 2009; Campbell, 2000; Holbrook, 1994, 1996; Johnston et al., 1992; Shaw, 1999; Stevenson and Vavreck, 2000; Vavreck, 2009).

A growing array of innovations in data collection and analysis has been directed at the problem of understanding campaign dynamics in all types of election. For instance, panel studies or 'rolling cross section' survey designs can provide insights into the movement of public opinion during a campaign (Brady et al., 2006). Unfortunately, for most elections, including the Scottish independence referendum, publicly available dynamic public opinion data is limited to 'trial heat' opinion polling conducted at irregular time intervals by a variety of polling companies each with their own 'house' methodologies. In such cases, Wlezien and Erikson (2002: 423) conclude that a definitive analysis of campaign effects 'seems well-nigh impossible'. We wish to explore whether political gambling market data can help to bridge this methodological impasse.

2. Political gambling markets and campaign dynamics

Political gambling markets are frequently used to forecast election outcomes. The Iowa Electronic Markets (IEMs) are the leading source of electoral betting market predictions (Tziralis and Tatsiopoulos, 2007). Analysis of the performance of the IEMs and other political gambling markets has tended to indicate that they can generate forecasts that are at least as accurate as, and often more accurate than, forecasts based on polling data - especially more than 100 days in advance of the election (Berg et al., 2008). While there are disputes as to whether the advantage of markets over polls recedes when polling data is adjusted for known biases (see: Erikson and Wlezien, 2008; Rothschild, 2009 for opposing sides of this debate), it is commonly recognised that forecasts arising from political gambling markets produce relatively accurate predictions; and this is true even for their historical antecedents (Rhode and Strumpf, 2004).

We contend that political gambling market data can tell us about the shifts in outcome likelihoods that take place during a campaign. The simple logic underlying this proposition is that if betting markets can provide reasonable forecasts of campaign outcomes at a single time point, then their evolution over multiple time points can shed light on campaign dynamics. Because of their continuous availability, gambling market prices, if collected regularly enough, can be analysed at a very high level of temporal granularity – potentially providing greater casual insight into campaign dynamics than polls. Although authors such as Berg et al. (2001) acknowledge the dynamic nature of electoral gambling markets, campaign dynamic analyses based on price data from such markets have been relatively rare. Nonetheless, several authors (Arnesen, 2011; Forsythe et al., 1998; Shaw and Roberts, 2000; Wolfers and Leigh, 2002) have used data from electoral gambling markets to analyse the effects of campaign events.

The theoretical rationale for analysing shifts in betting prices as an indicator of changes in outcome likelihoods is that these shifts reflect the integration into betting markets of new information. Shaw and Roberts (2000) note that IEM prices co-vary during US presidential campaigns with politically sensitive portfolio returns in US equity markets – indicating that gambling market prices can track substantive shifts that take place during campaigns. The mechanism that we rely on to ensure that prices aren't distorted by the ideological leanings of the bettors is the financial incentive that is attached to making sure that one's bet reflects the likelihood of an outcome. Forsythe et al.'s (1998) analysis is particularly encouraging in this regard – they note that, while there are indeed indications that many traders in political gambling markets are influenced by their partisan ideology, a smaller group of 'marginal' traders operate largely absent of such influences and quickly capitalise on any temporary market distortions caused by ideologically-inflated or deflated prices. Provided there is a cohort of dispassionate bettors seeking to make money by gambling on the referendum, we have reason to believe that price shifts reflect the integration of new information that influences the markets' perception of underlying outcome probabilities, rather than shifts in the ideological make-up of the betting population.

If we are to argue that gambling market price shifts reflect the absorption of fresh political information, then we cannot ignore the fact that the most concrete and consistent form of new information about outcome likelihoods during election campaigns comes in the form of polling data. Our analysis develops a nuanced model of the relationship between gambling market and polling data; capturing the variable effects of new polling information on political gambling markets. It is logical that such effects are likely to be more or less pronounced depending on the extent to which a poll creates an informational 'shock' – that is the extent to which a new poll release represents a deviation from the markets' anticipated polling value. This modelling approach accords with the theoretical contention that poll information should only influence perceived outcome likelihoods to the extent that it represents new information, in the form of a deviation from what could have been predicted *apriori*.

We seek to analyse event effects by controlling for the variability in our betting market data that can be attributed to the release of new polling information. Because polls provide direct (if imprecise) information about voting intentions, we anticipate that poll releases will account for the lion's share of variability in betting market prices throughout the course of the campaign. What remains in terms of variation, however, is most likely to be attributable to the effects of political events.

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