Television Audience Demand and the Effects of Surprise, Suspense and Shock

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Relevance of Uncertainty of Outcome

The empirical evidence from the literature suggest that uncertainty of outcome is not particularly relevant for stadium attendance and television audience.

In the case of TV audiences, the early evidence (Forrest et al 2005, SJPE) found in favour but very marginal.

Subsequent research also found this, however, evidence by Buraimo and Simmons (2015) found a shift from uncertainty of outcome towards superstars

Is the Importance of Uncertainty of Outcome Overstated?

Might it be that **uncertainty of outcome is overemphasised**. If audiences are not interested in uncertainty of outcome, what is the attraction?

The answer may be similar to the attractions across the entertainments. **People are essentially buying the same thing** - seemingly different sorts of products carry the same attributes of **Surprise** and **Suspense**.

For example, football fans want the emotion of suspense, like readers of a novel or gamblers as the roulette wheel.

Thus, in many entertainment industries, consumer demand studies will be enriched by focusing on the amount of surprise and suspense delivered by a particular product.

If relevant, is it possible to deliver more surprise and suspense in football?

What is Surprise?

Surprise is experienced when something happens to make one change one's beliefs about the future. For example, in a film, detectives seek to identify a killer and all the evidence points to the neighbour, but then the neighbour is found dead, creating surprise.

Such a '**twist**' in the plot - a radical **change in probabilities** about who was the killer – grabs the attention of the viewer and maintains interest in the story.

Note that 'surprise' is defined by **looking backwards** – loosely, it could be **quantified** by reference to the **change in the probability** (that the neighbour is guilty) between time ***t-1*** and the discovery of his body at time ***t***.

Suspense

By contrast, suspense is forward-looking, it is the emotion felt when one is curious about what will happen next.

Loosely, the degree of suspense at time *t* could be quantified by reference to the changes in probabilities that will occur depending on what happens at *t+1*

For example, if a football match is 3-0 with 5 minutes remaining, there is little suspense because, if there is a goal, there will be almost no change in the probabilities of a win for either team.

However, if the score is 0-0, the probabilities will change substantially if a goal occurs, so suspense is high and spectators are on the 'edge of their seats'

Shock

In addition to surprise and suspense, we have an additional variable shock.

Shock is the change in our assessment of what might happen given our expectations at the start of the match.

Formally, it is the difference in the probabilities at time *t* and time *t-0*. Essentially, what is happening now compared with the start of the match

So we have three properties, surprise, suspense and shock, which can all be formally established using probabilities and analytics and we can test their impacts in TV audience demand

The Data

TV audience data on 535 matches played in the EPL between 2013 and 2017 were provided by BARB.

Estimates of audience size are based on a rolling sample of c. 5,000 private households.

At one minute intervals the box records whether each TV is switched on and to which channel it is tuned

Participant households are given a pad with separate buttons for each resident and for guests – each one is instructed to press their button when entering or leaving the room.

Anyone who is in the room when a particular programme is showing on the set is counted as a viewer of the programme

The Data

The resulting estimates of audience size minute by minute enable us to evaluate how the size of the audience responds to events in the game.

All matches in the sample are shown on Sky or BT Sport.

Football data on EPL games are very rich and official records give the times of all goals, red and yellow cards, penalty awards, etc.

This enables us to construct measures of surprise, suspense and shock to serve as explanatory variables for audience size.

Understanding TV audiences wants is key for major sports. Deloitte suggests that 60% of clubs' revenue will derive from media rights

Challenges to the Study

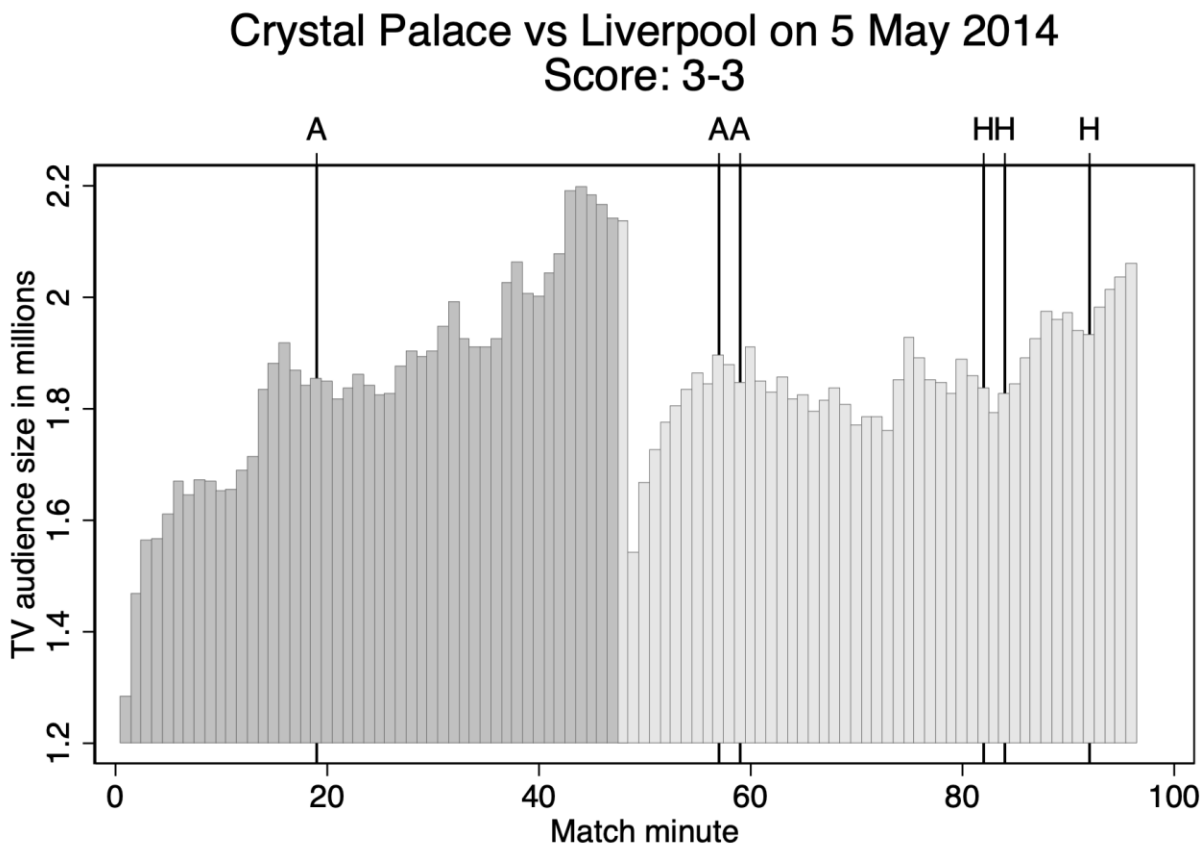
A significant problem which held up work on the project was that the time records in the audience and football data were to different clocks. Audience data were recorded by clock time (GMT)

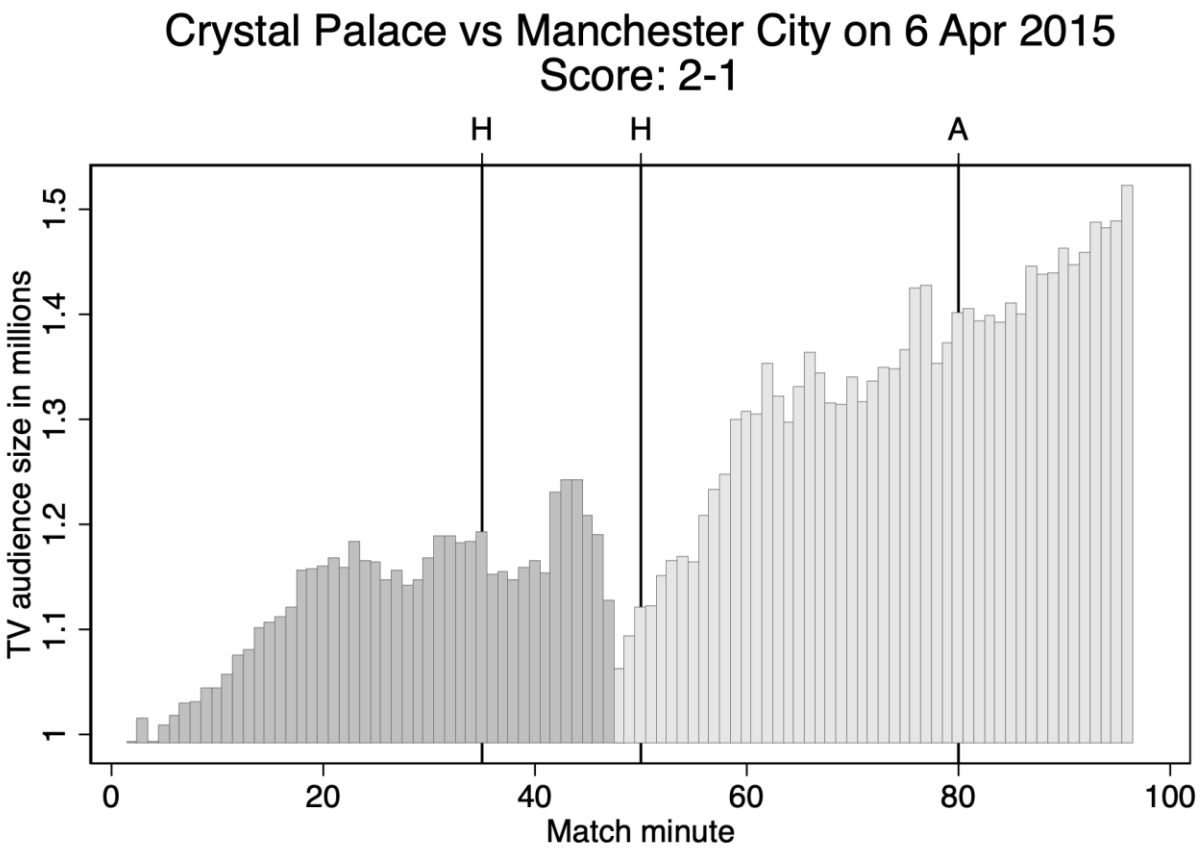
Football data were recorded from the start of the match/second half, e.g. minute 1 or minute 46

Thus we needed to synchronise the time across the two data sets – for example, the match might be scheduled to start at 4.00 p.m. but actually start at 4.02.

Using OPTA data, we were able to synchronise match events with TV audience data.

TV Audiences – Minute by Minute





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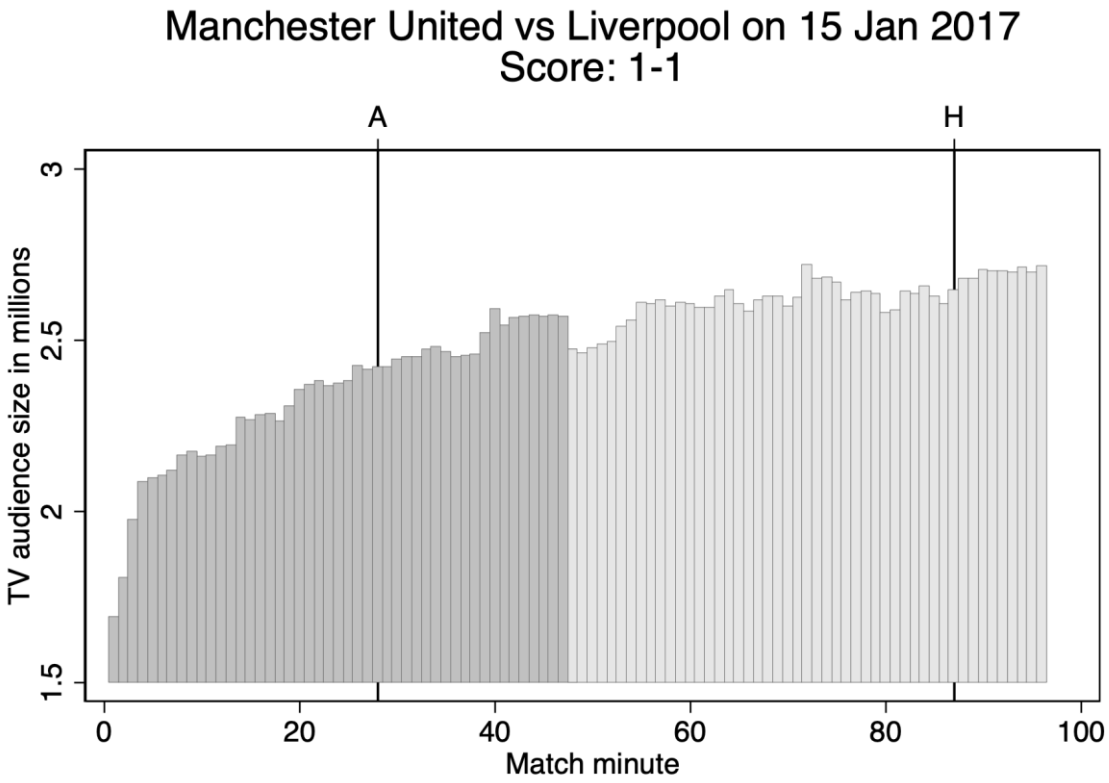
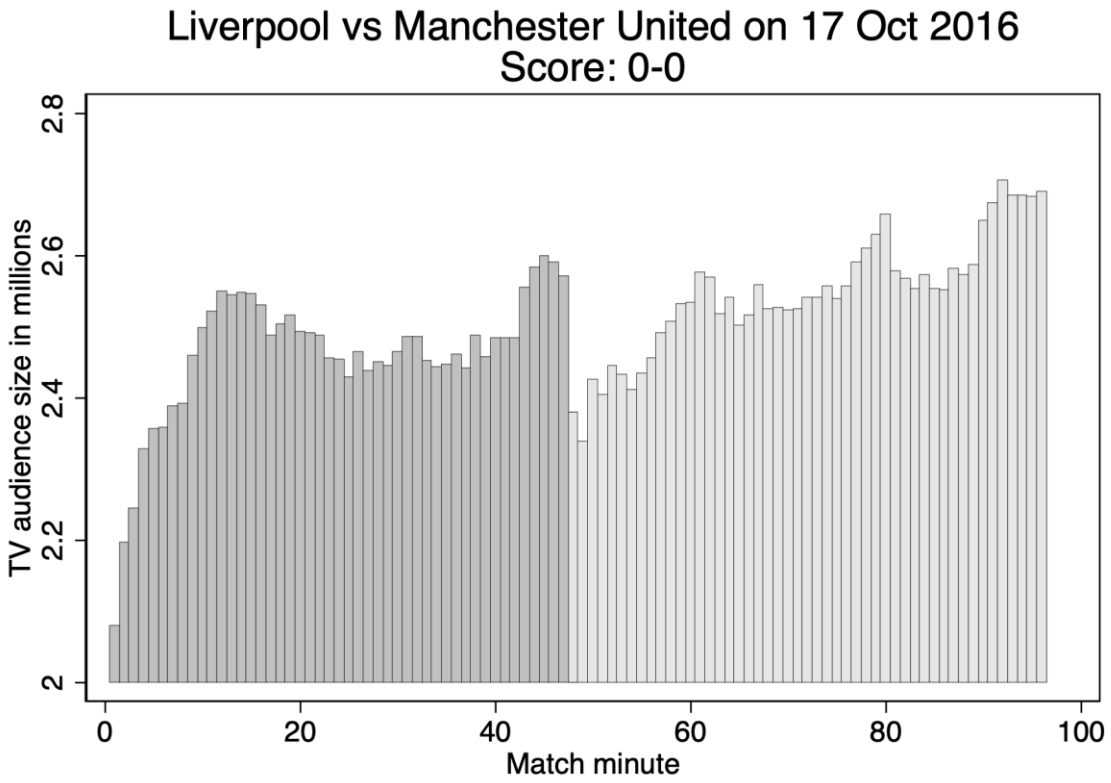




The Data

Our paper employs a large data set (47,250 minutes) only two previous studies of football have used minute by minute data.

We therefore test whether audience size at minute *t* is influenced by surprise, suspense and shock.

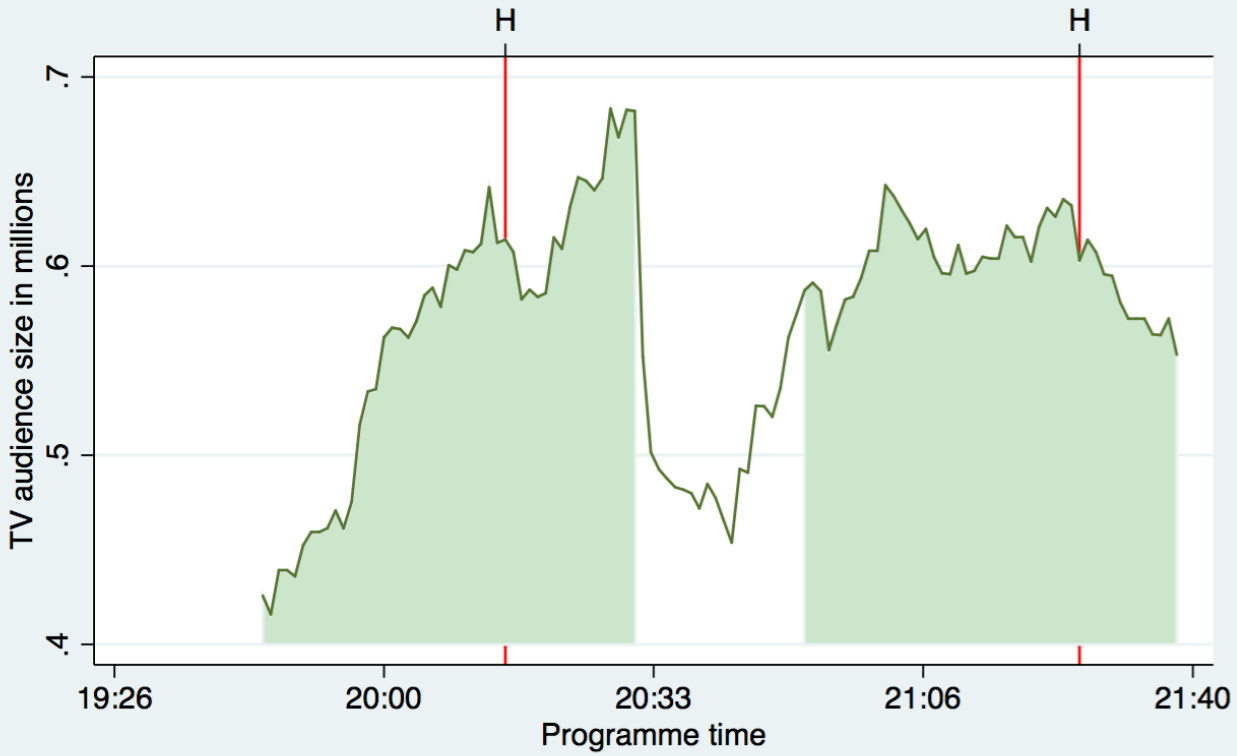
Measurement of Surprise, Suspense and Shock

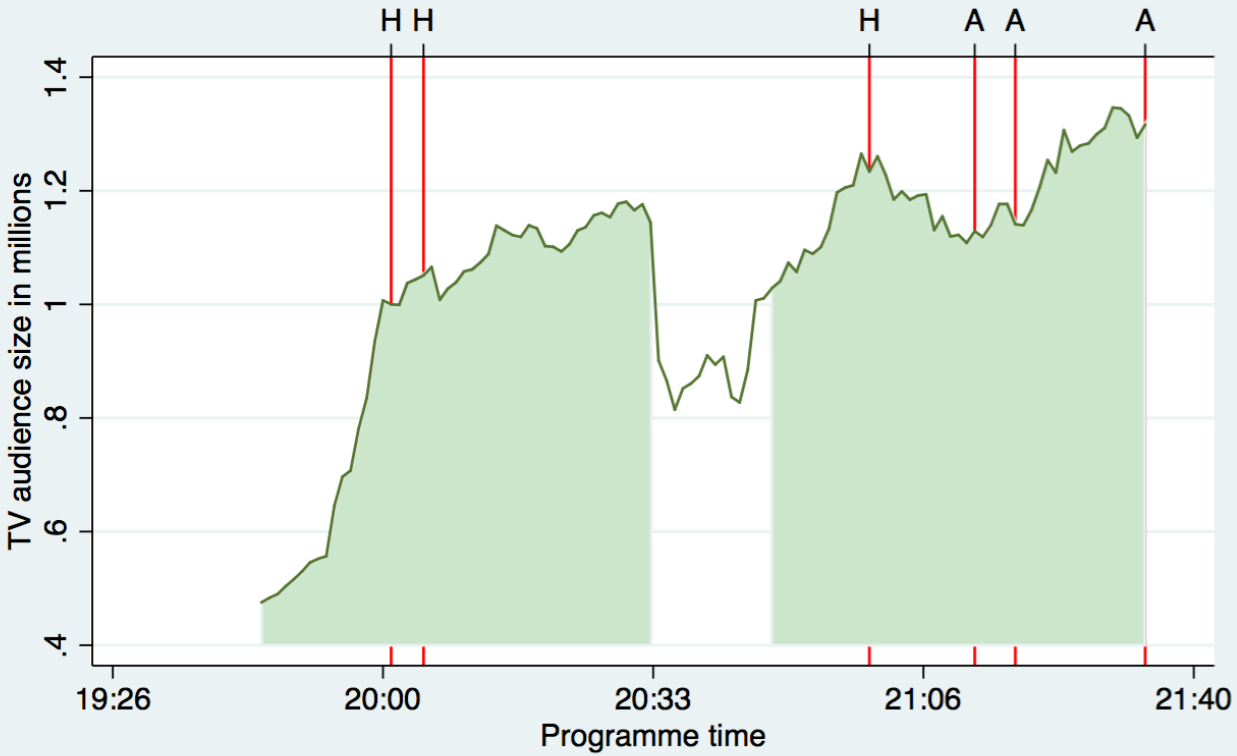
The set of required probabilities was generated from a forecasting model where outcome probabilities depend on pre-match betting odds, the current score, the number of red cards received by each team so far and the number of minutes remaining.

Measuring surprise, suspense and shock

- For surprise at minute *t*, we need the changes in probability since *t-1*.
- For suspense at minute *t*, we need the change in probabilities if either team were to score in *t+1*.
- Shock at minute t refers to the change in probabilities since the beginning of the match.

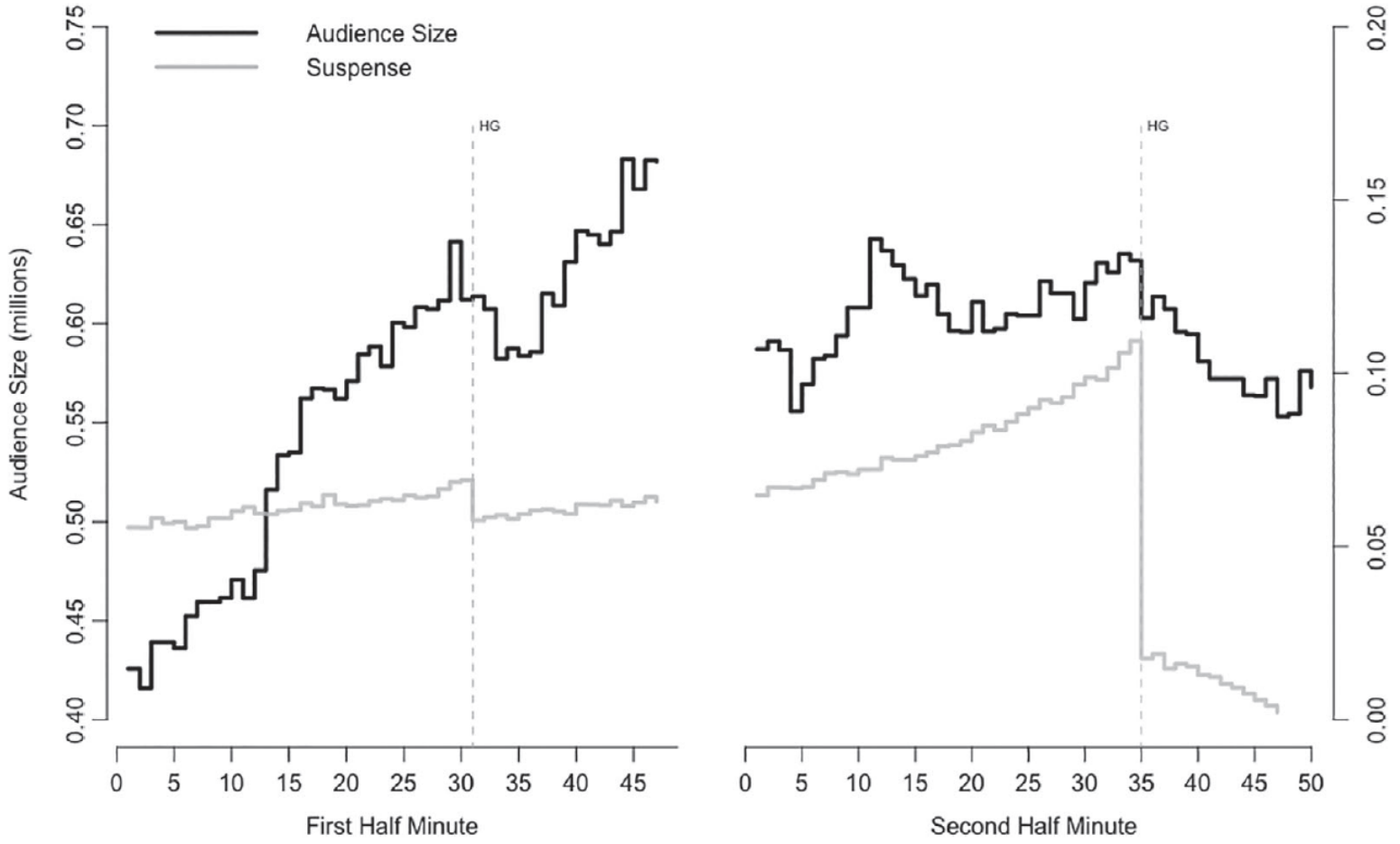
Routine vs. Humdinger





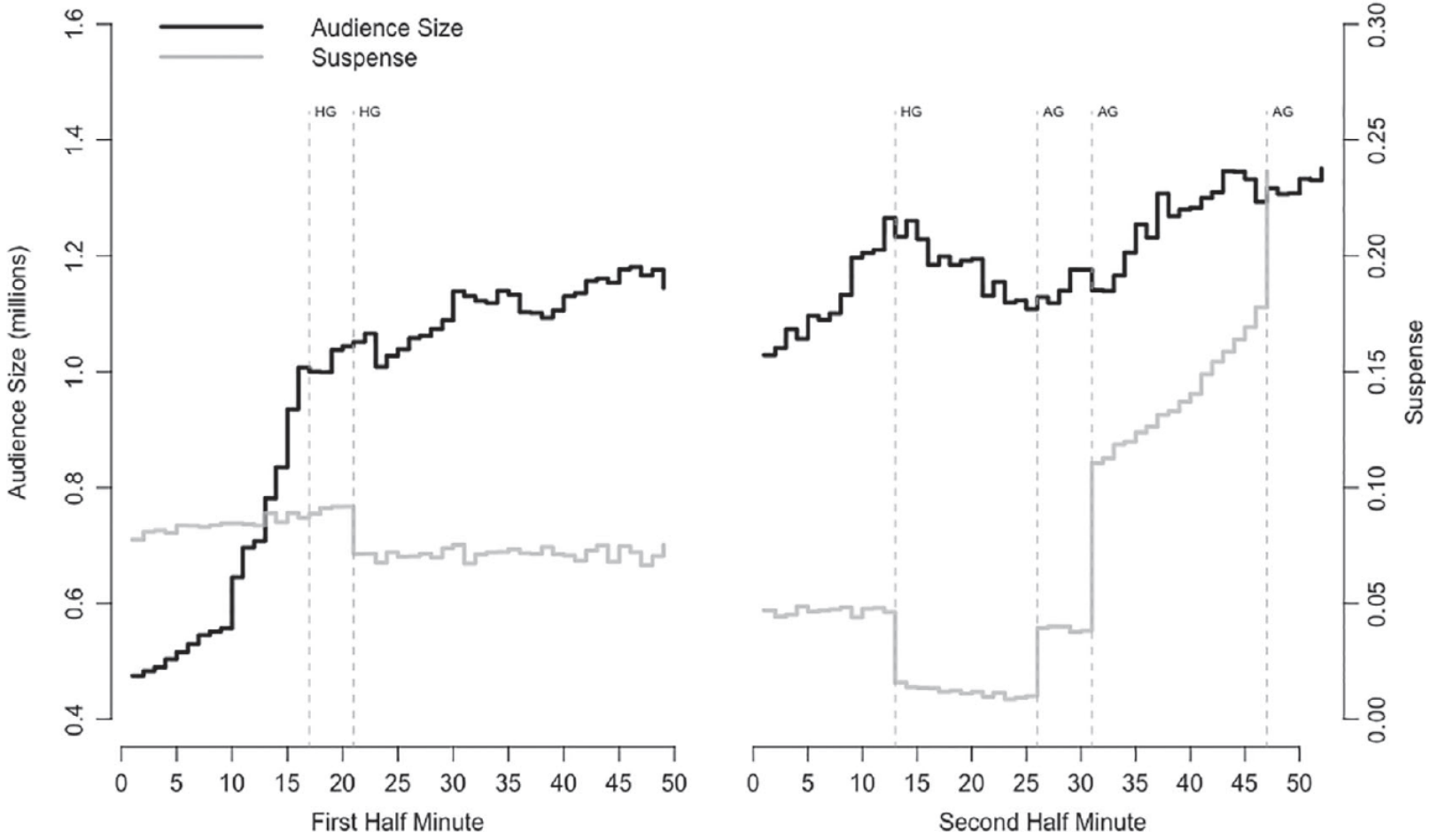
A Routine Game: Suspense

Audience Size and Suspense in a "Routine" Match (AFC Bournemouth vs. Southampton, March 1, 2016)

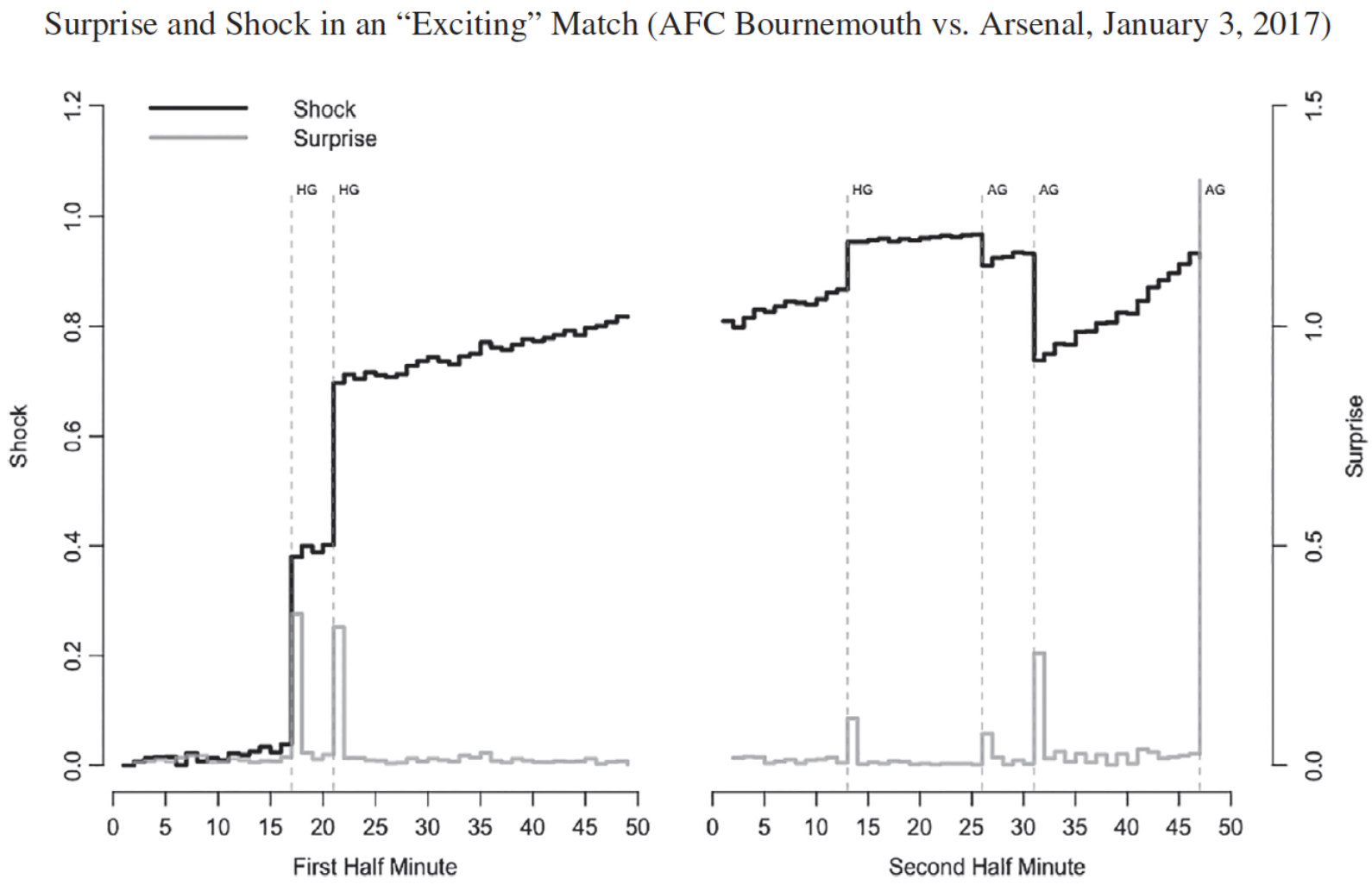


An Exciting Game: Suspense

Audience Size and Suspense in an "Exciting" Match (AFC Bournemouth vs. Arsenal, January 3, 2017)



An Exciting Game: Surprise and Shock



Our (Simple!) Model

Log (audience size) in match *i* at time *t* depends on:

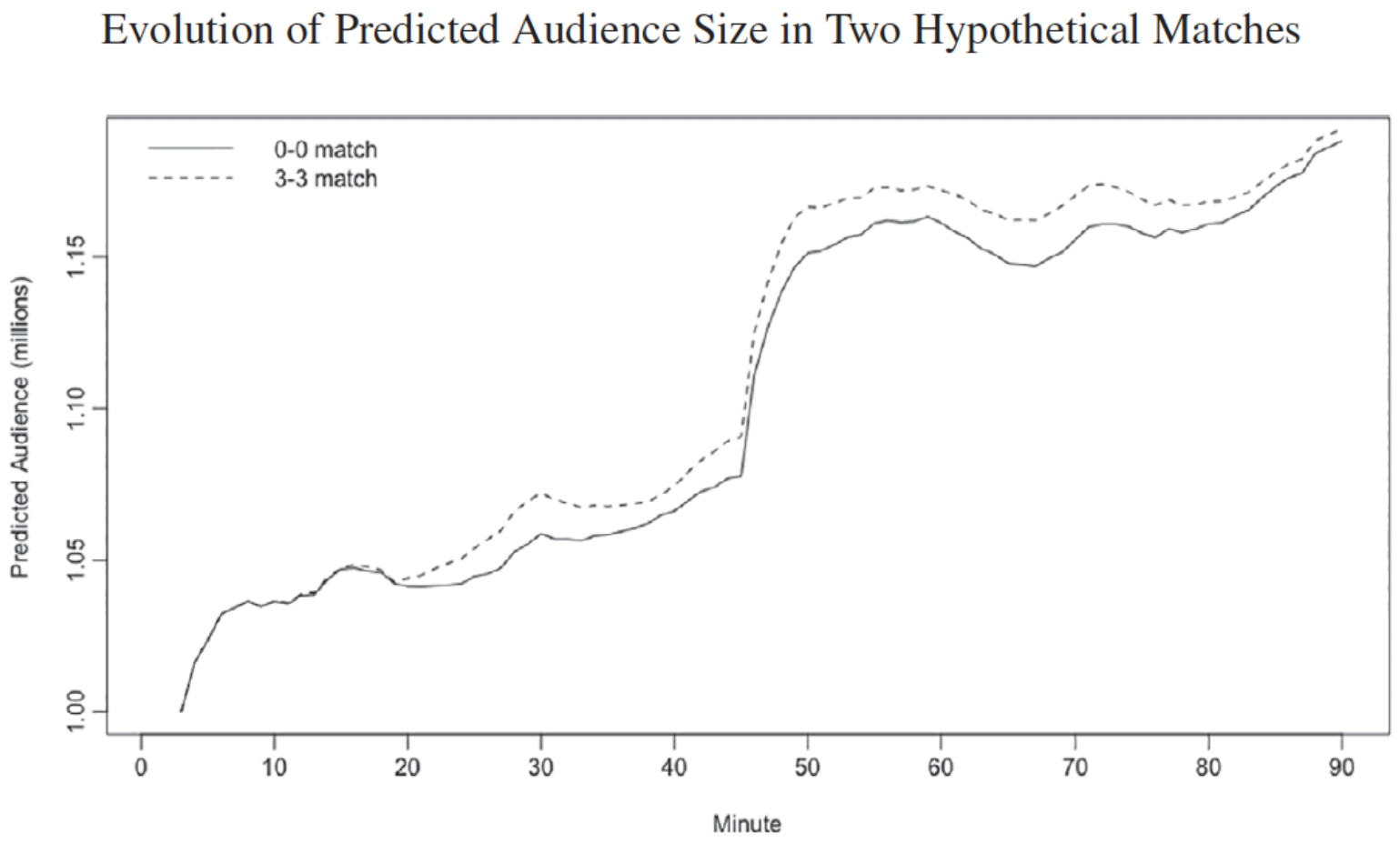
- Surprise (t)
- Suspense (t)
- Shock (t)
- Lagged dependent variable (to account for inertia)

Additionally, the model accounts for the popularity of teams, time of day, platform, and minute-of-match

Dependent Variable: log audience

Variables	Coefficients
Constant	.8911***
Log audience (*t-1*)	.9376***
Surprise	.0039***
Suspense	.0741***
Shock	.0033***
Observations	47,250
Adjusted R-sq	.9644

Simulation



Match A had no goals.

But in match B, the score was 3–3 at minute 70 and there had been goals for the home team at t = 20, 40, and 60 and for the away team at t = 30, 50, and 70.

One might say that the second match had been littered with surprise, suspense and shock.

Concluding Remarks

The surprise, suspense and shock available in football matches drive television audiences.

As with other entertainment genres, supplying these attributes is key for football authorities.

Across leagues, it would be interesting to seem which leagues offer the highest aggregate levels of surprise, suspense and shock.

Ultimately our interest is to find what pleases consumers.