

## The performance of Argos concessions in other stores

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### Project Background

Sainsbury's announcement of the acquisition of Argos will create a multi-product multi-channel retailer. As a consequence, as many as 200 of Argos's 845 stores are expected to close over the coming years with some relocated in Sainsbury's supermarkets. They are referred to as concessions stores.

Similarly, Homebase also announced the purchase of part of Argos business and therefore Argos concessions will also be allocated in Homebase retailers. From an industry point of view, research has been done for Argos own stores using only classical methods but not comparing different forecasting techniques to predict and understand annual sales in this new concept of distribution.

### Data and Methods

Five initial data sets provided by Argos comprise store characteristics, parent store attributes, catchment demographics, competition information and weekly sales information.

Weekly sales have been aggregated into annual sales. Taken as an indicator of store performance, annual sales have been analysed for the period between June 2015 to May 2016 using association and modelling techniques such as correlations, ANOVA, T Test and their non-parametric equivalent tests Kruskal Wallis and U Mann Whitney.

Additionally, forecasting techniques including multiple linear regression analysis, Multilayer perceptron neural networks and Chaid Decision Trees have been applied to forecast annual sales once having identified the best predictors from the initial datasets. Input variables have been chosen amongst the highest significantly correlated variables with annual sales with a few transformed variables to avoid multicollinearity.

### Key Findings

A few hypothesis using the above mentioned techniques have been set in order to establish whether there was a significant difference in the annual sales of concession stores based on geographic location, type of parent store, affluence of people in the catchment area and

the number of competitors at five minutes driving distance.



Figure 1. Argos datasets

Results from the analysis show there are no significant differences in annual sales based on geographical location (North, East, South and Central parts of the UK as well as location inside or outside of M25).

Annual sales are higher at Sainsbury's stores compared to Homebase where size of the store and space available to the public are significantly greater.

With regards to affluence there is a significant positive correlation between less affluent social groups and annual sales, meaning Argos target markets are medium to low socioeconomic groups.

The presence of competitors at five minute distance negatively affects annual sales. This negative relationship has not been found for competitors located at twenty minute distance.

A few models have been compared using Multiple Linear Regression, CHAID Decision Trees and Multilayer Perceptron Neural Networks to forecast annual sales at the concession stores. A seven input multiple linear regression model and a two layer perceptron neural network have offered the best forecast.

### Value of the Research

This research has found the main drivers of concession store performance that can help managerial staff to understand and explain Argos concession stores sales results.

The forecast models to predict annual sales of existing and future concession stores making use of not only classical methods but also machine learning techniques is also aimed to help future decision making.