

Title:

How To Find Your Most Valuable Service Outlets: Measuring Influence Using Network Analysis

Abstract:

Consider a network of stores operating under the same brand, for example, a chain of coffee shops (e.g., Starbucks) or banks (e.g., Wells Fargo). Improving quality and increasing sales at one store may have different impact on the other stores: from negative impact as a result of potential cannibalization, to positive impact from improved brand reputation and knowledge spillover. In this paper, we propose a comprehensive methodology to causally identify the network effects that stores have on each other and the total influence of each store on the entire network at a large scale. The novel and unique feature of our approach is construction and use of a large number of instruments that are based on store-specific replenishment policies and supply chain quality measures. The resulting model that uses high-dimensional data brings in an additional estimation challenge, which we address using the adaptive LASSO technique. By applying our method to a large scale dataset from a major national restaurant chain in the US, we show that the total influence of each store on the network sales has the median total influence of \$0.39 and can get quite large, which emphasizes the importance of our network analysis for service networks: a \$1 sales increase in one store can generate up to \$7.52 additional sales at other stores in the network, while it can also hurt the sales of other stores in the network by up to \$4.25. Our influence estimates provide valuable insights for the brand. For example, it can prioritize stores with the highest influences for ownership or improvement to optimize return on investment, and prioritize stores with the least influence for experimentation to mitigate the potential risk.

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Masha Shunko

Assistant Professor of Operations Management

Michael G. Foster School of Business

University of Washington

PACCAR 519

<http://foster.uw.edu/faculty-research/directory/masha-shunko/>

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