An analysis of shopping behavior at warehouse-club stores and its store-network-density implications

Since its inception as a business model over four decades ago, warehouse club (WC) retailing has grown to become one of the most successful retail formats in the U.S., accounting for almost $250 billion of annual sales. It has also grown at a faster rate over the past twenty years than any other retail format, including online retailing (Hortaçsu and Syverson, 2015). WC retailers’ success is rooted in operational strategies adapted from low-cost models found in the wholesale industry. A key attribute of these strategies involves WC retailers’ reliance on low-density store networks to serve the markets where they operate, enabling these retailers to achieve high labor productivity and efficiencies in store replenishments and inventory management.

Consider the case of Costco Wholesale, arguably the largest, most successful WC retailer in the U.S. On average, Costco operates approximately two stores in each of the markets it competes. This strategy of market expansion based on low-density store networks is contrary to what Costco’s competitors outside WC retailing have done in the past with their store networks. Retailers like Kroger and Walmart, for instance, have typically chosen to enter new markets by opening multiple stores almost simultaneously and have expanded at a faster pace than Costco the number of stores they operate in each of their markets. Kroger and Walmart operate almost 6 and 10 times, respectively, as many stores as Costco in the U.S. (Kroger, 2016; Walmart, 2016). Of course, underlying Costco’s decision in deciding which markets to enter is the awareness that consumers who choose to pay the annual membership fees required to shop at Costco’s stores may exhibit a lower sensitivity to accessing these stores relative to accessing non-WC stores (i.e. grocery, drugstore, general merchandise and super-center). In turn, this disparity in sensitivity to store access may influence the number of miles consumers are willing to travel to Costco’s stores, as well as the frequency of visits, and expenditures over time at these stores versus non-WC stores.
Past analytical modeling has advanced theoretical arguments and assumptions contrasting shopping behavior by consumers at WC stores and their purchasing behavior at non-WC stores (as a function of expenditures, visits, and traveled miles). This is despite the fact that no empirical evidence has been offered about these behaviors and how they vary as distance between consumers and WC stores increases. Kim and Choi (2007) speculate that consumers who join WC retailers will increase their amounts of visits, expenditures, and traveled miles to stores under other formats in order to supplement the limited assortments typically available at WC stores. In putting forth this conjecture, however, Kim and Choi (2007) assume that the distance separating WC members from WC stores is immaterial to the relationship between their shopping behavior at WC stores and at non-WC stores. Without a comparison between consumers’ shopping behaviors at a retailer’s store and their behaviors at other stores, estimations of the contributing elements to supporting WC retailers’ business model remain incomplete.

Using a unique dataset combining data from multiple sources, our study seeks to quantify differences in consumers’ shopping activities underlying Costco’s decisions to enter new markets across the US. This will allow us to identify key shopping attributes enabling Costco to compete in markets using low-density store networks against non-WC retailers serving those same markets but using store networks with higher density levels. To that end, we focus on consumers’ subscriptions to newly opened stores operated by Costco as single, stand-alone facilities across different U.S. markets as a treatment mechanism within a difference-in-differences (DID) analysis framework that contrasts consumers’ shopping behavior at Costco against their behavior at non-WC format stores.

Our results show that the weekly mileage accumulated per visit, the amount of dollars spent per visit, and the amount of dollars spent per mile to Costco’ stores, exceed by 7.4%, 29%, and 20%, respectively, relative to non-WC stores. This implies that when choosing between shopping at Costco’s stores versus stores under other formats, Costco members’ shopping behaviors reflect a significantly lower sensitivity to accessing this WC retailer’s stores than to accessing non-WC
stores. This also suggests that WC retailers like Costco are less vulnerable to spatial competition than retailers operating other formats are. This is not to say that Costco’s market pull is independent of the distance separating its stores from its members. We observe that, on average, members cut their weekly expenditures at Costco by 0.34% for every mile increase in the distance separating their homes from Costco’s stores. This reduction in weekly sales is an important part of the cost that Costco incurs from its reliance on low-density store networks and should be considered when designing trading radii that maximize per-store revenues.

We also find that in choosing to become Costco members, consumers increase their own costs of traveling to the stores. Once they become members, consumers as a whole increase their weekly visits and vehicle miles traveled not only to stores operated by Costco but also to the non-WC stores. This result is consistent with assumptions supporting analytical demand models in the literature regarding the supplementary relationship between the number of visits and mileage amounts consumers incur when shopping at WC retailers and those incurred when shopping at retail stores under other formats (e.g., Kim and Choi, 2007). Our result constitutes the first empirical evidence demonstrating such spillover phenomenon involving WC retailers. However, we also observe that these weekly vehicle-miles decrease with the distance that separates Costco members’ homes from Costco’s stores. According to our results, for every additional mile separating Costco members and Costco’s stores, members will increase by 0.40% their weekly amount of miles traveled to visit these stores relative to those traveled by the average member. However, they will more than offset this increase by cutting their weekly amount of miles traveled to visit non-WC stores by 0.79% relative to those traveled by the average member.

References