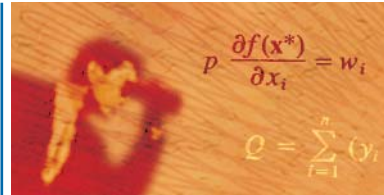


Antitrust Insights

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From the Editor

Why do some dry cleaners have stores that are just blocks apart? Why does Wal-Mart open new stores near its existing stores? The secret, it turns out, is that for some firms, the additional cost of operating a new store is much lower if the store is closer in proximity to the firm's other stores. There is no question that the principles of economics that make this true are of great interest to dry cleaners, retailers, and chains with locations across the country. But what may be surprising is that the underlying concepts also have important implications for merger analysis and an assessment of the potential efficiencies.

In this issue of *Antitrust Insights*, Mario Lopez, a Consultant in NERA's San Francisco office, examines why it may be efficient for a firm to own and operate multiple stores in the same geographic region. There are many sources of such locational efficiencies but, as Mario explains, they are derived from the presence of a centralized asset that has the capacity to serve multiple locations. Whether the asset is a distribution center that serves multiple stores or brand equity that generally increases the demand for a retailer's stores and services, a fixed or sunk investment in such an asset can greatly reduce the incremental cost of opening and operating additional locations.

Mario holds a PhD in economics from the University of California at Berkeley, where he specialized in the fields of industrial organization and the economics of institutions. His PhD thesis analyzed how firms choose to differentiate themselves in competitive settings. Specifically, he developed an empirical model to examine retailers' location decisions. That research was the springboard for this article and for Mario's general interest in understanding the expansion strategies of retailers.

I hope you enjoy this issue.

—Lawrence Wu, Editor

The Locational Efficiencies that Drive Geographic Expansion

Mario A. Lopez

Many retail mergers involve acquisitions that combine manufacturing plants, distribution facilities, or retail stores in complementary geographic locations. In general, acquisitions that combine assets located in different markets expand the merged firm's geographic reach and customer base in a way that does not raise competitive concerns. However, what if the merging firms have retail stores that are in the same general area? On the one hand, such an acquisition could raise the potential for a reduction in local competition. On the other hand, the transaction could yield locational efficiencies. For example, the acquisition may allow the firm to reduce its distribution costs and the time it takes to get products from the warehouse to the retail outlet. These locational efficiencies can be important, and in this article, I examine the sources of these efficiencies and why they facilitate geographic retail expansion.

I begin with two real-world examples that illustrate how locational efficiencies can shape a firm's geographic expansion and growth. I first look at dry cleaning stores in San Francisco and examine small firms' motivations to open additional outlets. I then turn to Wal-Mart and find that similar incentives have driven its nationwide expansion. This is followed by a discussion of the underlying economics and their implications for public policy.



Dry Cleaners: Excess Capacity and Geographic Expansion

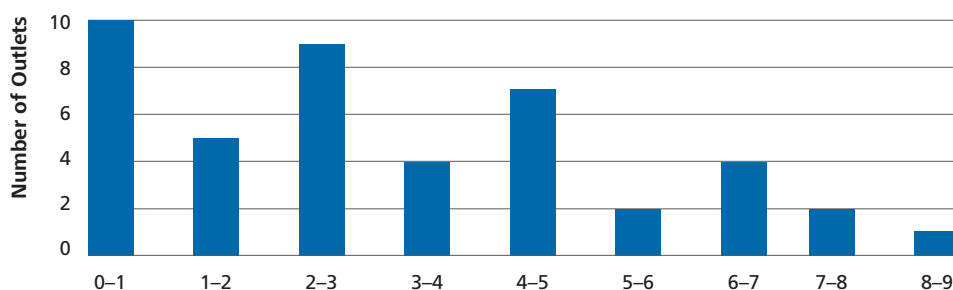
In San Francisco, over 350 dry cleaning shops compete for an estimated \$49 million that is spent by area consumers on dry cleaning each year. The average store has annual revenues of \$135,000 or a little more than \$11,000 per month¹

Dry cleaners pay wages and other labor costs (which would include the opportunity costs of the store's owner-operators), as well as costs associated with rent, utilities, and maintenance. Some dry cleaners own their own dry cleaning equipment and, in San Francisco, the equipment is typically located at the store itself. For these cleaners, the overhead and non-labor costs would include the fixed costs that were incurred in purchasing and installing the equipment and the costs associated with operating the machinery.² Other cleaners choose not to operate their own machinery and instead open a standalone drop-off location. These cleaners have third parties do their dry cleaning, and they pay the costs associated with outsourcing, including the transportation costs of

delivering clothes to and from the third party cleaner. A dry cleaner's decision to purchase machinery involves a tradeoff: firms that opt to purchase their own equipment must make a higher initial investment, but their operating costs are lower.³

which means that there may be efficiencies associated with owning multiple stores. The data suggest that transportation costs are important, too. As shown in Table 1, multi-store dry cleaners tend to open new stores that are located in close proximity to

Table 1: The Proximity of Outlets for Multi-Store Dry Cleaners in San Francisco



Driving Distance between a Dry Cleaner's First Location and its Outlets (Miles)

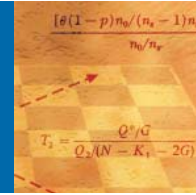
Improving capacity utilization is one way to increase the return on an owner's investment in equipment. For example, this can be accomplished by using the same cleaning machinery for additional stores. In San Francisco, at least 21 percent of the dry cleaners are part of a multi-store operation,

each other. Indeed, the data show that dry cleaning establishments open a majority of their additional stores (54 percent) within a three-mile range of the owner's first store. These location choices suggest that a dry cleaner is more likely to find a profitable location nearby because the incremental cost

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Dry cleaning establishments open a majority of their additional stores (54 percent) within a three-mile range of the owner's first store.

of an additional store is lowest within a relatively narrow geographical range.⁴ In other words, while it is the excess capacity of the cleaning facility that lowers the incremental cost of adding a new retail outlet, the efficiencies are best realized within a localized area.

Why do these cleaners locate their new stores in such close proximity to their existing store? For dry cleaners—particularly those that own their own cleaning equipment—there are locational efficiencies that affect two related questions: Should the owner open a new retail store, and where should that store be located?

The Decision to Open a New Store

For dry cleaners who own their equipment, the decision to open a new store depends importantly on whether that equipment is already running at full (or close to full) capacity. If the facility is running at full capacity, it may not be feasible for the owner to add a new location and serve it using that facility. If, however, the facility is running at a relatively low capacity utilization rate, then a new location may help increase the facility's productivity. In this case, a new location may improve the dry cleaner's productivity without much additional expense. While the cleaner would incur the incremental cost of adding a new drop-off location (e.g., renting additional retail space, purchasing new furnishings, and staffing the store), it would not have to purchase additional cleaning equipment. Instead, the cleaner can clean the additional clothes received using the equipment at its existing location. This reduces the owner's upfront investment, and it

may allow the owner to lease a smaller retail space for the new location.

Without the need to purchase additional cleaning equipment, it is more likely that the stream of annual profits associated with the new location will exceed the startup and variable costs of the new retail outlet. The ability to open a new location that can leverage existing assets reduces the incremental cost of opening a new store and makes geographic expansion more likely.

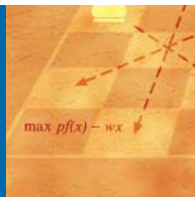
The Efficiencies of Proximity

Once the decision to open a new store has been made, the cleaner must decide where to locate the store. For dry cleaners, one important factor is the transportation costs associated with ferrying clothes back and forth between the new retail outlet and the location of the cleaning equipment. These transportation costs will include labor and fuel costs, as well as time. For example, if the drop-

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of economic issues that arise in antitrust cases, including market definition and market power, market structure and entry conditions, pricing, and other conduct affecting competition, profitability, and damages. NERA's expertise includes assessing and, when necessary, testifying to the economic merits of allegations of foreclosure and exclusionary conduct, tying and bundling, refusals to deal, vertical restraints, collusive behavior, essential facilities, and anticompetitive pricing behavior.



off location has same-day service, a dry cleaner can more easily meet this guarantee if its stores are closer together. All else equal, the incremental cost of opening a new location is lower if the new store is closer to the site at which the cleaning equipment is located.

The actual location of the new store, however, may depend on the amount of excess capacity at the original location available to serve it. An owner considering whether to locate at a more distant location with greater potential demand than closer locations must consider the tradeoff between transportation costs and increased sales. If the cleaning facility is already near full capacity, the transportation costs may outweigh the benefits derived from reducing excess capacity. If this is the case, a new store at a distant location may not be profitable. In general, closer locations will have lower associated transportation costs and will be more profitable, although proximity raises the risk that the new store will cannibalize an existing store's sales. Greater levels of excess capacity, however, may extend the range over which the firm will search for new locations, making it more likely that the firm could profitably locate a new store farther away.

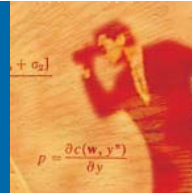
Multi-Store Efficiencies and Geographic Expansion: A Closer Look at Wal-Mart's Growth Strategy

Since its incorporation in 1962, Wal-Mart has opened over 3,000 stores with retail locations throughout the entire United States. Its expansion across the country, however, has taken a path that reveals much about Wal-Mart's distribution and cost structure. For the most part, Wal-Mart's new store locations have been near its existing stores, rather than in seemingly more profitable locations farther away. Like dry cleaners, strong locational efficiencies have driven this expansion.

Wal-Mart's first store in Rogers, Arkansas became the center of its initial wave of expansion. Wal-Mart opened its next 18 stores in Arkansas, Missouri, and Oklahoma. In the 35 years that followed, Wal-Mart located hundreds of stores across the South and Midwest. In fact, Wal-Mart did not open its first store in California until 1990. After Wal-Mart opened its first outlet in California, more stores followed quickly. By 2007, Wal-Mart had 167 stores in California.⁵ Vice-president of finance David D. Glass summarized this strategy in 1979 as: "We are always pushing from the inside out... We never jump and then backfill." Thus, Wal-Mart's expansion strategy was to locate new stores near its existing stores.⁶

For the most part, Wal-Mart's new store locations have been near its existing stores, rather than in seemingly more profitable locations farther away.

What drove this expansion appears to be Wal-Mart's much-studied warehouse and distribution network.⁷ Over time, Wal-Mart has made its distribution centers function as network hubs, which collect goods directly from suppliers and distribute them to its retail outlets. This has allowed Wal-Mart to bypass more traditional third-party wholesale distributors. For example, over 80 percent of Wal-Mart's merchandise is shipped directly to its distribution centers, which is high compared to other discount retailers.⁸ As a result, Wal-Mart is able to obtain a variety of locational efficiencies. As a simple example, a truck that serves five retail stores may be able to serve a sixth store at a relatively low incremental cost. This would be the case if Wal-Mart's trucks had space to carry more goods and if the trucks would not have to drive much farther to reach the sixth store. However, it also appears that Wal-Mart is able to achieve more complex logistical efficiencies, which have allowed it to optimize more deliveries over more stores and to realize economies of



scale in its distribution centers. Like dry cleaners, the efficiencies inherent to a centralized resource, such as a distribution center, effectively reduce the incremental cost of opening additional stores. Moreover, the transportation and distribution costs also have made it more efficient to locate new stores in close proximity to its existing ones.

How Locational Efficiencies Reduce the Incremental Cost of Expansion

The examples above illustrate how locational efficiencies can arise when a firm has geographically diverse operations that revolve around a centralized asset. For dry cleaners, this asset is the store that has the cleaning equipment, while for Wal-Mart, the centralized asset is a warehouse. Conceptually, the efficiencies described above stem from the use of centralized assets that can serve nearby retail outlets, which makes the efficiencies locational. As the Wal-Mart example shows, a firm may also realize economies of distribution when many outlets are located in close proximity to one another. Because these distributional

efficiencies can only be realized within a certain geographic range, they, too, are locational.

Locational efficiencies can be described in two ways, although they are similar conceptually. One way to describe the efficiency is in terms of how a new retail location can improve the productivity or capacity utilization of a centralized asset. In the case of Wal-Mart, additional retail locations allow Wal-Mart to make better use of the warehouses and truck fleet that served the company's retail stores—a warehouse may have space to carry the goods sold by an additional store, and a truck may be able to carry more goods on each trip.

Another useful way to describe the efficiency is in terms of the incremental cost of owning and operating an additional retail outlet. In both of the examples above, an initial investment in a centralized asset reduces the incremental cost of future expansion. For example, given an existing warehouse and a set of retail stores, how much would it cost the firm to open another retail outlet? The new outlet would have the usual labor and

A warehouse, a fleet of trucks that serve a broad geographic area, and production facilities are examples of centralized physical assets that can be leveraged to serve multiple retail outlets.

store-specific overhead costs, but if the new outlet can be served by an existing warehouse or fleet of trucks, the actual additional cost of opening the new store would be significantly reduced. In other words, to open a new store that is in close proximity to an existing store, Wal-Mart may not need to build a new warehouse or expand its fleet of trucks. By avoiding the need to incur these expenses, the cost of opening a nearby retail outlet is much lower than the cost of opening the first store in a new geographic territory.

Sources of Locational Efficiencies

The examples given earlier illustrate the locational efficiencies that are driven by economies of distribution.⁹ A warehouse, a fleet of trucks that serves a broad geographic area and production facilities (e.g., dry cleaning

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The cost of opening new stores in areas in which there are existing stores is much lower if the company already has invested in building its brand in that area. Once initial advertising expenses have been incurred, a firm will be able to spend incrementally less on advertising or promoting new stores.

equipment) are examples of centralized physical assets that can be leveraged to serve multiple retail outlets.

However, there are other sources of locational efficiencies, such as better information and knowledge about a local market. Like a warehouse, local knowledge can be a centralized asset that reduces the cost of opening new stores near existing stores. Indeed, once an entrepreneur has learned about a market opportunity in a particular area, the incremental costs of opening additional retail stores in

the same locale is likely to be much lower than it would be to open a new store in some other area (where one would have to invest in learning about the market opportunities present in that area).

The investments that a company may make in developing its brand could be another source of locational efficiencies. Like a distribution center or dry cleaning facility, the firm's brand equity could act as the centralized asset that reduces the incremental cost of opening additional stores. For chain clothing stores, fast food restaurants, and coffee shops, for example, the cost of opening new stores in areas where there are existing stores is much lower if the company already has invested in building its brand in that area. Once initial advertising expenses have been incurred, a firm will be able to spend incrementally less on advertising or promoting new stores. In other words, once a brand has been established in an area, the incremental cost of generating demand for a new store is lower, thus making geographic

expansion more profitable. These efficiencies are therefore locational in nature.

Tradeoffs Associated with Locational Efficiencies

Locational efficiencies may drive firms to expand locally, but there are limits. The benefits of proximity will be compromised if a new store cannibalizes the sales of a firm's existing stores. For example, San Francisco's multi-store dry cleaners almost never locate their additional stores within the immediate vicinity of an existing store. Similarly, for Wal-Mart, the incremental cost of opening a store that is located close to one of its distribution centers may be low, but the potential tradeoff is that opening a store near its other stores may have costs in the form of cannibalized sales.

Expansion also may be limited by the degree to which the centralized asset at the hub of expansion has excess capacity. If the hub cannot serve additional outlets, then the incremental cost of additional outlets may, in effect, be much higher. The

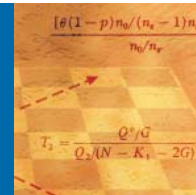
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geographic range over which the firm can realize locational efficiencies also may be another limiting factor. At some distance, transportation costs will overcome the efficiency gains associated with reducing excess capacity.

For these reasons, a firm's local expansion strategy is likely to reflect a complex set of tradeoffs. For a dry cleaner, excess capacity in cleaning equipment may motivate the owner to open a new store. However, even if there is excess capacity, dry cleaners are unlikely to use one set of equipment to serve two stores that are located far from each other. For example, in San Francisco, hour-plus traffic times over bridges to other cities across the San Francisco Bay (such as Oakland) would greatly increase the effective transportation costs, making it unlikely a dry cleaner would service these areas with equipment in San Francisco.¹⁰ As a result, there may be a geographic band around a firm's existing stores in which it may be most profitable to open new stores. The near-side boundary may be locations at which the new store would not cannibalize sales from an existing store, and the far-side boundary may be defined by the relevant transportation costs.

The Wal-Mart experience also illustrates how locational efficiencies can shape

the structure of the firm. Once a distribution center has been established, the incremental cost of an additional store decreases over a large range of stores. Wal-Mart's first distribution center, for example, was designed for 80 to 100 stores. In other words, a warehouse allowed Wal-Mart to realize economies over a large number of stores and a broad geographical range.¹¹ Eventually, Wal-Mart found it more profitable to open additional, even larger distribution centers across the country as it expanded.¹² Wal-Mart's distribution system therefore exhibits network-like effects—the economies to any one store increase as Wal-Mart increases the number of stores that are served by a particular distribution network.¹³ Moreover, all of this can be scaled to a higher level if there are network effects across hubs.¹⁴

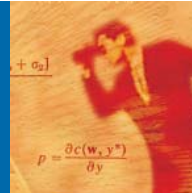
Implications for Public Policy

In assessing the competitive implications of a proposed merger, one consideration is the potential for the transaction to yield efficiencies or pro-competitive benefits. If the transaction allows the firm to expand its production, customer reach, or retail sales, then there are benefits to consumers that would have to be weighed against the prospect of harm to consumers in a local geographic area. For example, consider a merger

of two retail chains with multiple stores around the country and centralized distribution and/or production facilities. Depending on the location of the stores of the merging parties relative to each other's existing distribution centers, the transaction could yield locational efficiencies.

Locational efficiencies also can be important in the context of regulatory restrictions on retailers. Many city and state governments, for example, place limitations on retailers. In San Francisco, any new locations by a chain with 12 or more stores (nation-wide) are subject to city approval. In Japan, the Large-Scale Retail Location Law, which became effective in June 2000, gives local authorities veto power over any new retailer that has proposed opening an outlet requiring space greater than 1000 square meters.¹⁵

Both types of regulations have the common feature of restricting expansion by existing firms.¹⁶ By hindering geographic expansion, such regulations could prevent firms from realizing the locational efficiencies described above. These regulations may overlook the lower incremental cost of opening an additional retail outlet, which would allow a firm to profitably operate in locations where entry or expansion would otherwise be unprofitable. There may be legitimate



reasons for such regulatory restrictions, but the analysis should consider the tradeoff associated with restrictions that raise the cost of expansion, particularly by firms that are already in the marketplace.

Conclusion

Both local firms (such as dry cleaners) and national chains (like Wal-Mart) have incentives to realize locational efficiencies, which translate into lower incremental costs and create a pattern of expansion that revolves around a centralized asset. A reduction in incremental costs can increase the geographic reach of the firm, which may benefit consumers by reducing travel costs and offering greater convenience. There are many sources of locational efficiencies, but they share a common theme, which is that a fixed or a sunk investment in a centralized asset can lower the incremental cost of owning and operating multiple stores in a geographic area.

NOTES

- 1 This estimate of total spending on dry cleaning is based on data from Applied Geographic Solutions, Inc. (AGS). AGS estimates dry cleaning expenditures using a Consumer Expenditure Survey and matches it to local demographic data to estimate total expenditures for a particular geographic region. The number of dry cleaning establishments is based on data gathered by American Business Disc (InfoUSA), which collects business information from Yellow Pages databases.
- 2 Dry cleaners can buy two types of equipment—a dry cleaning machine that is used for clothes that require dry cleaning and laundering equipment that is used for standard clothing articles (e.g., shirts).
- 3 The cost of a dry cleaning machine will vary depending on the capacity of the machine. Americlean, a franchise dry cleaner that provides a “turnkey” set up, has total startup costs that range from \$190,000 (for a 40 lb. machine meant to serve a single location) to \$450,000 (for a 65 lb. machine and other equipment meant to serve two drop-off locations). According to economists Ricard Gil and Wesley R. Hartmann, an investment in dry cleaning machinery lowers operating costs to 12 percent of revenues (compared to 50 percent for dry cleaners that outsource their cleaning). See Ricard Gil and Wesley R. Hartmann, “Airing Your Dirty Laundry: Vertical Integration, Reputational Capital and Social Networks,” (working paper, Stanford Graduate School of Business, May 2006).
- 4 Multi-store dry cleaners appear to recognize these locational efficiencies, but they are not necessarily the only ones. Dry cleaners with excess capacity may contract with other dry cleaners, gaining some of the same efficiencies of a multi-store structure. Like an owner’s choice to open a new location, a dry cleaner with excess capacity would be expected to develop outsourcing relationships with local, rather than distant, cleaners.
- 5 In February 2007, Wal-Mart had 22 supercenters and 145 discount stores in California. See <http://www.walmartfacts.com/StateByState/?id=5> (last accessed on April 2, 2007).
- 6 See Stephen P. Bradley and Pankaj Ghemawat, “Wal-Mart Stores, Inc.” (Harvard Business School case, 9-794-024, November 6, 2002), at 3.
- 7 Studies of Wal-Mart’s expansion include Thomas J. Holmes, “The Diffusion of Wal-Mart and Economies of Density,” (working paper, University of Minnesota, 2006); Emek Basker, “The Causes and Consequences of Wal-Mart’s Growth,” forthcoming in the *Journal of Economic Perspectives*; Panle Jia, “What Happens When Wal-Mart Comes to Town: An Empirical Analysis of the Discount Retailing Industry,” (working paper, Massachusetts Institute of Technology, 2006). For a more general business perspective on Wal-Mart’s operations, see Bradley and Ghemawat, “Wal-Mart Stores, Inc.” (as cited in note 6), and Pankaj Ghemawat, “Wal-Mart Stores’ Discount Operations” (Harvard Business School case, 9-387-018, May 10, 1989).
- 8 The same figure for Kmart is estimated to be at about 50 percent. See Stephen P. Bradley and Pankaj Ghemawat, “Wal-Mart Stores, Inc.,” at 6 (as cited in note 6).
- 9 The examples that follow focus on geographic expansion, but there are parallels in the product dimension. A local sales force, for example, could act as a centralized asset. Once a company has built its sales force, the economies of distribution may be as simple as having a traveling salesperson carry more products in his or her sales bag. In this context, the incremental cost of carrying a second product—like the cost of opening a second retail store—is relatively low. The ability of a salesperson to market multiple products in one visit is therefore an example of a distributional efficiency.
- 10 San Francisco is a peninsula with the Pacific Ocean to the west and cities to the south. The Golden Gate Bridge connects to cities to the north and the Bay Bridge connects to cities to the east.
- 11 See Pankaj Ghemawat, “Wal-Mart Stores’ Discount Operations,” at 5 (as cited in note 7).
- 12 Research by Pankaj Ghemawat found that Wal-Mart’s newer distribution centers were “meant to serve up to 175 stores within a 150- to 300-mile radius.” See Pankaj Ghemawat, “Wal-Mart Stores’ Discount Operations,” at 5 (as cited in note 7).
- 13 Indeed, Thomas J. Holmes models the profits of a Wal-Mart store as a function of the density of nearby stores in attempting to measure the benefits of additional stores as a residual spillover effect. See Thomas J. Holmes, “The Diffusion of Wal-Mart and Economies of Density” (as cited in note 7).
- 14 For example, because many product manufacturers ship directly to Wal-Mart’s distribution centers, the manufacturers themselves may be able to achieve locational efficiencies by using the same truck to deliver products to multiple distribution centers.
- 15 In Japan, the regulation is known more formally as the Law Concerning the Measures by Large-Scale Retail Stores for Preservation of the Living Environment. See Jens Høj and Michael Wise, “Product Market Competition and Economic Performance in Japan,” (working paper no. 387, OECD Economics Department), at 24. Available at http://www.sourceoecd.org/rpsv/workingpapers/18151973/wp_5lgsjhvj7w26.htm (last accessed on April 9, 2007).
- 16 See the discussion in Jens Høj and Michael Wise, “Product Market Competition and Economic Performance in Japan”: 23-24 (as cited in note 15).

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