Entry of Large Discount Stores and the Evolution of Employment in the Korean Retail Sector

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September 9, 2013

Abstract

Along with the rapid expansion of big-box stores since the mid-1990s, the Korean retail sector underwent significant structural changes. Using county-level data from 1997 to 2010 in Korea, we examine the effect of the entry of large discount stores on local retail employment. Our results, based on the differences-in-differences approach, show that the entry of a large discount store in a county increases approximately 200 retail jobs. Two-thirds of this gain is attributable to the entry of the large store itself, whereas the other one-third to the expansion of other retail sectors. In particular, we find that the entry of a large discount store increases employment in non-general merchandise sectors such as bakeries, clothing stores, and electronics stores. Such an increase is concentrated in small stores with fewer than 10 employees. Our finding suggests that the opening of a large discount store may have a spillover effect on the local retail sector, thereby leading to an overall increase in employment in the county. Such a finding of a positive employment effect is in sharp contrast to previous findings on the employment effect of large retail chains, most of which were focused on the Wal-Mart in the U.S. While Wal-Mart competes with incumbent chain stores, large discount stores—the first nationwide large-scale chains introduced in Korea—may play a role as anchor stores and attract new small stores into the neighborhood.

JEL Classification: R12, J21, L81
Keywords: Large Discount Stores, Entry, Retail Location, Local Employment, Retail Trade

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1. Introduction

The diffusion of big-box stores, operated by national or multinational companies, has dramatically changed the global retail industry over previous decades. As such stores provide a wide range of products at relatively low prices, they have rapidly gained popularity and play an ever-growing role in most developed and developing economies. Although the growth of big-box stores has contributed to increases in consumer welfare (Hausman and Leibtag, 2005), productivity gains in the retail sector (Foster, Haltiwanger, and Krizan, 2006), and product upgrading among upstream manufacturers (Iacovaone *et al.*, 2011), there has been concern that such growth in big-box stores does not lead to employment growth in the retail industry. In particular, big-box stores have been criticized for driving out small family-owned retail stores and destroying traditional retail districts.

The impact of big-box stores on local employment dynamics has been a very controversial issue among researchers and policymakers around the world.[1] Recently, a growing number of studies have examined whether big-box stores, represented by Wal-Mart, create more jobs or destroy them. Thus far, most studies have focused on the effects of Wal-Mart stores on local retail employment in the U.S. (Basker, 2005; Neumark, Zhang, and Ciccarella, 2008), but these studies have not reached a consensus on the employment effect of Wal-Mart yet. Moreover, most previous studies have focused on net employment change at the location-level (e.g., county-level). Such analysis of net change in location-level employment may mask potentially important reallocations among various types of retailers.

The entry of a large discount store entails structural change in the local retail industry. An increase in price competition may not only lead to a restructuring *within* an existing store,[2] but also change the composition of retailers in the industry, thereby driving out unsuccessful stores from the market. The impact of such changes varies across industries within the retail sector, depending on the products they

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[1] The studies include Jia (2008) and Sobel and Dean (2008) for the US, Rivero and Vergara (2008) for Chile, Borraz *et al.* (2009) for Uruguay, Igami (2011) for Japan, and Schivardi and Viviano (2011) for Italy.
[2] For example, competition from Wal-Mart increases the competitors' product quality through better inventory management (Matsa, 2011).

sell and the size of the stores. For example, the effect of the entry of large discount stores may vary across groups of different sizes (e.g., small mom-and-pop stores vs. medium-sized supermarkets) and industries (e.g., general merchandize stores (GMS) such as supermarkets vs. specialized shops such as bakeries and clothing stores). Understanding the process of such structural change is crucial in analyzing the effect of large discount stores on employment changes in the retail industry.

Through this study, we contribute to the growing literature on this subject by providing new evidence of the impact of large discount stores on the Korean retail industry from 1997 to 2010. We address the shortcomings of previous studies and focus on the extent to which employment effects of the entry of large discount stores vary across different industries and establishments of different sizes. In order to unveil the underlying mechanism of employment changes in local retail employment, we utilize establishment-level data from the Census on Establishments and construct a data set on county-level retail employment by detailed industry, establishment size, and both industry and size. Our county-level dataset containing both establishment size and industry information enables us to analyze the adjustment and reallocation mechanisms in local retail employment after the entry of large discount stores. Our data is sufficiently rich for exploring which types of stores are more vulnerable to the entry. In particular, we examine the role of substitutability and complementarity, along with size, in explaining the effect of the entry by a large discount store on local employment.

Using differences-in-differences (DID) estimation, we find that the entry of large discount stores increases retail employment in the affected county. We find that two-thirds of the employment gain is attributable to the entry of the large store itself. This employment gain comes at the cost of employment loss in medium-sized general merchandise stores, such as supermarkets. On the other hand, we find a positive impact on small general merchandise stores, although it is not statistically significant. There is mixed evidence among studies that utilize micro establishment-level data regarding whether the entry of large discount stores has a negative impact on small retailers. Haltiwanger, Jarmin, and Krizan (2010) find that the entry of big-box stores has a substantial negative impact on small chains and local mom-and-pop

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stores, particularly stores in the same sector and immediate area. In contrast, Ellickson and Grieco (2013) find that Wal-Mart's entry into groceries left small stores essentially unaffected. Our finding that medium-sized supermarkets are negatively affected in the same GMS sector is consistent with their findings that the impact of entry by large discount stores is largest among stores that directly compete with large discount stores, that is, medium-sized supermarkets in the case of Korea. On the other hand, the negligible effect on small stores suggests that small stores in the GMS sector may have been "insulated" from the entry of large discount stores due to the closing of medium-sized supermarkets. In addition, while small, traditional mom-and-pop stores in the immediate area were directly affected, such a negative effect could be dwarfed by openings of new convenience stores. While our data does not permit us to directly examine the within-store restructuring, a substantial number of traditional mom-and-pop groceries are also known to switch to modernized convenience stores. By operating longer hours than a large discount store, they provide an easier access to customers in the neighborhood who stop by for a few daily items such as drinks, snacks, and cigarettes. These services by small stores are complementary to those offered in a large discount store and enable them to survive in the changing environment.

Another interesting finding is that there is an increase in the employment in small and specialized stores (i.e., non-GMS) in the county where a large discount store has opened. This finding suggests that a large discount store may have a spillover effect on the local retail sector, thereby attracting small, specialized shops in the neighborhood. Such a different effect of the entry by large discount stores in Korea than that observed in developed countries might be associated with a different stage of development in the Korean retail sector. In the U.S., Wal-Mart, a nationwide large chain store, competes with local or regional chain stores. Existing chain stores with similar formats and providing similar services make them easily substitutable by Wal-Mart. On the other hand, until very recently, the Korean retail sector was dominated by small shops in traditional market districts and independent small and medium-sized supermarkets. In contrast to the experience in advanced countries, neither regional chains of supermarkets (or chains of specialized retailers) nor large-scale stores were established in Korea at the

time when large discount stores were introduced in the mid-1990s.[3] These large discount stores were the first large-scale retail establishments in Korea, with nationwide store chains. They provided convenient shopping amenities such as parking, indoor shopping areas with air conditioners or heaters, and food courts, which attracted other specialized stores and customers. The complementarity between large discount stores and specialized stores, which satisfied the increased demand for modern shopping environments, enabled specialized stores to grow, thereby creating more jobs in the local retail industry. Our finding suggests that this positive effect appears to have overwhelmed any negative effect on retail employment after the entry of large discount stores. The spillover effect of the entry of big-box stores in developing countries may occur beyond the retail sector. For example, the diffusion of Wal-Mart in Mexico resulted in product upgrading by upstream manufacturers (Iacovaone *et al*., 2011).

The ongoing structural change in retail trade—that is, the shift from single-store retailers toward big-box national chains such as large discount stores and hypermarkets—is a worldwide phenomenon. The pattern of structural change and the impact on the retail industry may vary across countries in different development stages. However, with the exception of studies in the U.S., that mostly focus on the effect of Wal-Mart, relatively little academic research has been conducted on important changes in the retail industry. By analyzing data on the Korean retail industry and providing new evidence on the impact of the structural change in a developing country, this study will enable us to understand the evolution of retail industry around the world.

The remainder of this paper is organized as follows. Section 2 provides a brief background of large discount stores in Korea. Section 3 explains our data and variables, and section 4 describes our empirical specification. Section 5 presents the estimation results, and section 6 concludes.

2. The Diffusion of Large Discount Stores in Korea

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[3] An exception is department stores that have nationwide chains; however, these do not compete directly with local retailers because most of them are located in urban shopping districts and sell high-quality products.

A typical large discount store in Korea is a national retailer chain selling food and general merchandise.[4] The store format is similar to a hypermarket or superstore because approximately 50% of store sales comprise food, which includes fresh food. Thus, discount stores play the roles of both supermarkets and discount stores that sell general merchandises at low prices. A typical store spans approximately 11,000 square meters and hires 100–150 workers; products in a store are displayed in an easy-to-spot manner rather than being piled up on shelves, resembling Target Corp. rather than Costco in the U.S.[5]

We obtained information on the locations and opening dates of large discount stores from the *Yearbook of Retail Industry* published by the Korea Chain Stores Association. According to Korean Law on the retail industry, a retail chain store is classified as a "large discount store" if it operates in an area that is over 3,000 square meters and sells items at lower prices than small retail stores. Given that most social and political interest has been focused on large discount stores with national chains, in this study, we include only national chains with at least 10 stores in 3 provinces or more (among the total of 16 provinces in Korea). Therefore, we classified the following seven brands as large discount stores: E-mart, Homeplus (Tesco), Lotte Mart, Hanaro, Wal-Mart, Homever (Carrefour), and Aram Mart (See Table A in the Appendix for details). In 2010, these seven national chains accounted for over 95% of all large chain discount stores. Most of these chains were active during our sample period between 1997 and 2010; however, Wal-Mart was merged to E-mart in 2006 and Aram Mart and Carrefour were merged to Homeplus in 2005 and 2008, respectively.[6]

Before large chain discount stores were introduced in the mid-1990s, the retail sector in Korea was

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[4] Descriptions of the diffusion of big-box stores and their impact on the structure of the retail sector are found in Jarmin, Klimek, and Miranda (2009) for the U.S. and Haskel and Sadun (2009) for the U.K.

[5] This product display may reflect the preference of Korean customers, as described in WSJ (2006)—"Koreans hate the warehouse format."

[6] Not all the foreign retail transnational corporations (TNCs) that entered Korea were successful. For example, both Carrefour (which entered in 1996) and Wal-Mart (which entered in 1998) failed to attract local customers and withdrew from the Korean market in 2006; on the other hand, Tesco, a late entrant (allied with Samsung in 1999) became one of the three leading discount store chains. Coe and Lee (2013) argue that the success of Tesco could be attributed to its adoption of various localization strategies, which includes a two-floor layout, product line selection, product display, and even the name Homeplus—all of which are imported from the Korean Store. In contrast, Carrefour and Wal-Mart were far less adaptive of their global operation processes and formats to Korean market conditions.

long dominated by small shops in traditional market districts and small and medium-sized local supermarkets. In contrast to the experience in advanced countries, neither national nor regional chains of supermarkets (as well as specialized retailers) were established in Korea at the time when large discount stores were introduced.[7] This is in sharp contrast with the case of Wal-Mart that competes with both incumbent chain retailers as well as mom-and-pop stores. Since the first E-mart store opened in Seoul in November 1993, large discount stores have rapidly expanded all over the country.

[Figure 1 about here]

Figure 1 illustrates the diffusion of large discount stores in Korea from 1995 to 2010. In 1995, there were only five stores located in the Seoul metropolitan area. During the initial stage of the diffusion, most openings were observed in and near major cities such as Seoul, Busan, and Daegu. As large discount stores, which first appeared in major cities, expanded all over the country, new stores began entering neighborhood locations and were located in close proximity to existing stores. In 2010, over 60% of the counties in the country had at least one large discount store (See Table B in the Appendix for details). Areas highlighted in light gray in Figure 1 indicate counties in mountainous areas with a population of fewer than 50,000 people. According to Chun, Heo, and Lee (2013), population is a key factor in determining the demand for the large discount retail industry. No discount stores are found to enter counties that have a population of fewer than 50,000 people (except for two counties). In 2010, large discount stores were diffused over 80% of counties with a population of over 50,000 people. This confirms that the growth of national retail chain stores is one of the key features of the evolution of the Korean retail industry during the previous two decades.

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[7] National chains of supermarkets—the so-called super-supermarkets (SSM)—began spreading after the mid-2000s. SSMs are also believed to be a threat to small groceries. This is similar to the case in the U.S., where the diffusion of supermarket chains such as A&P, Kroger, and Safeway in the 1920s and 1930s caused many small firms to exit from the grocery industry (Ellickson, 2011).

3. Data

This study utilizes establishment-level data from the Census on Establishments from 1997 to 2010, collected by Statistics Korea. The Census on Establishments is an annual survey that encompasses all establishments in Korea. This survey includes information on store-level employment with detailed location and industry. Using raw establishment-level data, we constructed county-level panel data on retail employment by detailed industry, establishment size, and both industry and size. While establishment-level analysis is also of interest and importance, recent studies on the employment effect of big-box stores such as Wal-Mart used county-level data to analyze the impact of such stores on the local labor market (Basker, 2005; Neumark, Zhang, and Ciccarella, 2008). Given the social and economic interest on the impact of national chain stores on the local retail industry, we chose to focus on the change in county-level retail employment after the entry of a large discount store. Because the dataset of this study is constructed from establishment-level data with detailed location, size, and industry information, it permits us to analyze the extent to which the employment effect varies across groups of different sizes (e.g., small mom-and-pop stores vs. medium-sized supermarkets) and industry groups (e.g., supermarkets (GMS) vs. specialized shops (i.e., non-GMS) such as bakery and clothing stores).

According to the Korea Standard Industry Classification (KSIC), there are 57 detailed 5-digit industries in the retail sector. We label all retail stores except used-good stores and no-store retailers (i.e., on-line only stores) as Total Retail. To distinguish the spillover effect of the entry of large retail chain stores on other retail industries from the effect on the industry that large discount stores belong to, we divided the total retail industry into two groups: i) Large GMS, to which large discount stores belong, and ii) Other Retail including small (1–9 employees) and medium-sized (10–49 employees) GMS and all non-GMS stores.

[Table 1 and Figure 2 about here]

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Along with the rapid expansion of large discount stores, the retail sector in Korea underwent significant structural changes. Figure 2 and Table 2 illustrate changes in the employment distribution across three groups: small (1–9 employees), medium (10–49 employees), and large (50 or more employees). While there was no noticeable change in total retail, the employment distribution in GMS and non-GMS moved in opposite directions. Among GMS, the importance of large establishments increased as large discount stores expanded. On the other hand, the share of employment in small-sized stores decreased from 74% in 1995 to 64% in 2010. This finding implies that the growth of large discount stores might have come at the cost of small stores.

In contrast, in the non-GMS sector, the employment share of small establishments increased from 86% to 93% and the share of large employers decreased from 6% to 1%. This suggests that the importance of small shops increased among specialized retailers. In section 5, we further examine the extent to which the growth of small shops in the non-GMS sector is related to the entry of large discount stores.

4. Empirical Specification

We estimate the effect of the entry of large discount stores on local retail employment by employing a difference-in-differences (DID) model of the following form:

$$\left(\frac{Emp}{Pop}\right)_{i,t} = \alpha + \beta Entry_{i,t} + \mu_i + \eta_t + \mu_i Trend_t + \varepsilon_{i,t} \tag{1}$$

where the dependent variable is retail employment per 10,000 people in county i in year t, and *Entry* is a dummy variable that takes the value of 1 if a large discount store enters county i between year $t - 1$ (pre-treatment) and t (post-treatment), and 0 otherwise. The DID model includes the county-fixed effect, μ_i, year-fixed effect, η_t, and county-specific linear time trend, $\mu_i Trend_t$. The county-specific time trend allows for either an increasing or decreasing retail employment trend that is specific to each county. In our

county-level dataset, the inclusion of the county-specific trend in the model is crucial because this controls heterogeneous trends among counties, particularly for some newly developed towns that are undergoing a rapid growth in both retail employment and population.

We use county-clustered standard errors to address a possible serial correlation within a county. As indicated by Bertrand, Duflo, and Mullainathan (2004), the serial correlation with a county is more crucial than the correlation of shocks to counties within each province-year cell when the sample used in DID estimation relies on a long time-series. Nonetheless, in order to allow correlations among counties within a province, we also use province-year clustered standard errors; however, the obtained results are qualitatively the same.

We included one- and two-year leads since merely the news of the opening of a large discount store may affect retail employment even before the actual opening of such a store (i.e., anticipatory effect). We also estimated the model with lags to account for the lagged effect of store opening. The lags capture the accumulating impacts of the entry and exit of other retail stores. The following is our DID regression specification with dynamic effects:

$$\left(\frac{Emp}{Pop}\right)_{i,t} = \alpha + \beta Entry_{i,t} + \sum_{\tau}^{2} \gamma_{\tau} Entry_{i,t+\tau} + \sum_{\tau}^{2} \emptyset_{\tau} Entry_{i,t-\tau} + \mu_i + \eta_t + \mu_i Trend_t + \varepsilon_{i,t} \qquad (2)$$

where γ and ϕ estimate anticipatory and accumulating effects, respectively.

To estimate our DID models, we construct a county-level panel dataset for 249 counties from 1993 to 2010. As mentioned earlier, large discount stores first appeared in 1993, but were diffused in less than 5% of countries before 1997. Further, no chain of discount stores satisfied our criteria for national chains until 1997. Thus, we chose the sample period from 1997 to 2010. Since a DID model estimates the difference between the average retail employment change between $t-1$ (pre-treatment year) and t (post-treatment year) among the treated and control groups of counties, conditional on no entry of large discount stores at $t-1$, we excluded counties with large discount stores in 1997 (the first pre-treatment

year in the panel dataset). In addition, we used the indicator variable of store opening in our DID model as the entry effect cannot be estimated with a different number of stores. Therefore, we excluded counties in which two or more stores entered in the same year. Furthermore, we excluded county-year observations after the post-treatment year of treatment counties because another store may enter the treatment counties after the post-treatment year. We also excluded three counties in which over 20% of the employment is created by the retail industry in retail hubs in the three largest metropolitan areas—Seoul, Busan, and Daegu. Finally, the sample included 2,110 county-year observations for 215 counties from 1997 to 2010. Table 2 reports the summary statistics for our county-level dataset used in the DID regressions.

[Table 2 about here]

5. Results

5.1 Main Results

Estimates of equation (1) are reported in Table 3. Column (1) reports the estimate when the dependent variable is county-level retail employment per 10,000 people. In order to assess the effect in terms of employment, the changes in the number of employed is calculated using the coefficient and mean population (reported in the column "Employment Effect" in each table). In particular, the coefficient 15.2 implies that employment in the overall retail sector increased by approximately 198 workers more in the county where a new large discount store was opened as compared to that in other counties. This effect includes the increase in employment due to the entry of large discount store itself (i.e., own-effect). While the exact number varies among stores, a typical large discount store hires approximately 100–150 workers. In order to assess the spillover effect of the entry of a large discount store on other retail industries, excluding own-effect of large discount stores, we define two sub-industries: (1) Large GMS including large discount stores and department stores and (2) Other Retail including small and medium-sized GMS (mom-and-pop groceries, convenience stores, and supermarkets) and all non-GMS (e.g., clothing,

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electronics, butcher shops, etc.).

[Table 3 about here]

The result in column (2) of Table 3 implies that approximately two-thirds of the employment gain in Total Retail is attributable to the entry of the large discount store itself. The entry of a large discount store increased employment in the Large GMS category by 129 workers. Given that a typical large discount store hires 100–150 workers, this estimate suggests that most employment change in the Large GMS industry can be accounted for by the own-effect (i.e., job creation by the store opening itself). Whether the effect of the entry of large discount stores on other retailers, such as small mom-and-pop groceries, is negative or positive has been a key question among researchers who have focused on the employment effect of the entry of Wal-Mart. Although the magnitude is relatively small, the result in column (3) suggests that employment in Other Retail also increased more in counties where a large discount store was opened (approximately 70 employees more).[8]

The specification in Table 3 does not provide information on the dynamics of employment change around the time when a large discount store entered the county. Given that the competitors have advance information regarding the entry of a large discount store (e.g., one or two years before the opening date), there is a possibility that retail stores in the county respond even before a large discount store enters, by relocating to other locations and expanding or contracting the scale of the store in expectation of the increase in competition. On the other hand, if the employment growth in the retail sector leads to the entry of a large discount store, the results in Table 3 may obscure the endogeneity issue: large discount stores choose to enter those counties whose growth rates exceed those of other counties. To address this concern, Table 4 presents the base specification results augmented with one- and two-year leads and lags.

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[8] As indicated by Neumark, Zhang, and Ciccarella (2008), it is worth noting that the positive employment effect does not necessarily indicate an increase in the absolute level of employment. There has been a decline in the overall retail employment in Korea. The estimated increase is relative to a counterfactual of what would have occurred in retail employment if no large discount stores had entered.

[Table 4 about here]

As evident from Panel A of Table 4, the coefficients on the leads of entry are not statistically significant for the entire retail industry. The retail employment per capita increased within a year of entry but the estimated effect was not significant after two years. Overall, the timing of a change in employment in the retail industry appears to concur with the entry of a large discount store. In Panel B, we examine the dynamics of employment change in the subgroup of Large GMS. The coefficient of one-year lead is negative and statistically significant, thereby providing some evidence of an anticipatory response to the entry of large discount stores (Column 1). This finding suggests that some large GMS stores may have been contracted one year before a large discount store entered the county. However, such an effect is relatively small and disappears once the indicator variable for the two-year lead before the entry was included in the regression. In Column (2), both the lead coefficients are shown to become statistically insignificant. In Column (5), only the one-year lead indicator is significant at the 10% level. It must be noted that large discount stores are classified into the Large GMS sector. The finding of a concurrent increase in employment in this sector suggests that employment change in the Large GMS sector can be attributed to the own-effect of the entry of a large discount store.

It is evident from Table 3 that the entry of a large discount store has a positive effect on employment in Other Retail. In Panel C of Table 4, there is no strong evidence of an anticipatory effect in this subsector. On the other hand, the estimated employment growth in this subsector appears to have occurred with a lag, one year after the entry of a large discount store. This is an important finding in terms of the following two perspectives. First, the positive employment effect found in Other Retail suggests that large discount stores may have generated a positive effect in the retail industry. The finding of the positive employment effect is somewhat expected given that the entry of large retail stores leads to the creation of jobs for the stores themselves. However, considering the common belief that the entry of large chain

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stores would destroy jobs in small stores in the area, the finding of the positive effect on Other Retail is somewhat surprising. Second, this finding suggests that large discount stores may have a positive spillover effect on Other Retail, particularly on smaller shops. Our finding that the employment growth in Other Retail occurred one year after a large discount store entered the county supports this view. In the next section, we divide Other Retail into different sizes and industry groups and examine the extent to which such positive effects vary across retailers of different sizes. In particular, we divide Other Retail into three groups based on establishment-level employment: small (1–9 employees), medium (10–49 employees), and large (50 or more employees).

[Table 5 about here]

5.2 Results by Size and Industry

Table 5 presents the estimation results when the dependent variable is employment in three different groups of Other Retail The result in column (1) suggests that the entry of large discount chain stores increased the employment of small retailers. The coefficient of 4.272 in column (1) implies that employment in this group (i.e., Other Retail with small shops of less than 10 employees) increased by approximately 56 jobs in a county where a large discount store was opened.[9] This group includes specialized small shops (non-GMS) such as clothing and electronics, as well as small-sized GMS such as mom-and-pop grocery and convenience stores. The employment effects on other size groups, medium (10–49 employees) in column (2) and large (50 and more employees) in column (3) are also positive, but statistically insignificant.

[Table 6 about here]

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[9] If we assume that the average number of employees in this group is 3 workers, 56 workers will correspond to approximately 18 establishments.

In Table 6, we further divide small and medium-sized groups into two industries respectively: GMS and non-GMS. We do not report the results for stores with more than 50 employees because they account for only approximately 1% in Other Retail and the estimated results for this subgroup were not statistically significant, as reported in Table 5. The results in column (2) suggest that the positive employment effect on small stores, reported in Table 5, was mainly concentrated on employment growth in specialized stores (i.e., non-GMS), rather than small GMS such as mom-and-pop grocery and convenience stores.

This finding implies that large discount stores may have played the role of anchor stores, attracting small, specialized stores in the county. The finding of a positive employment effect among small retail stores is in sharp contrast with the previous finding of the negative effect of the entry of Wal-Mart on small establishments (Basker, 2005). Large discount stores sell a wide array of products and compete directly with other GMS stores. While the entry of a large discount store is expected to have hurt small GMS stores in the neighborhood, we did not find any negative employment effect among small GMS in the county. One possible explanation of this non-significant estimate is that small GMS that are located at a distance from large discount stores may not have been directly affected by the entry of large discount stores, even though small GMS that were located close to the large discount store were significantly affected. In a study focusing on the impact of Wal-Mart on the geography of grocery stores, Ellickson and Grieco (2013) find that the effect of Wal-Mart is highly localized, limited within a two-mile radius of its location. Further, Haltiwanger, Jarmin, and Krizan (2010) find that the entry of big-box stores is more likely to affect smaller chain stores within 1 mile or 1–5 miles from big-box stores. It is possible that the negative impact of the entry of large discount stores may be attenuated in our case as well. However, we do not expect that the distance from the large discount store has had a significantly different effect on small retailers in the same county because the size of a county in Korea is relatively small compared to that in the U.S. We believe that small GMS stores compete with large discount stores in a different

dimension, operating 24 hours and providing easier access for "quick" shopping for just a few items for daily use, such as drinks, snacks, or, most of all, cigarettes. Moreover, these small GMS may have benefited from the entry of large discount stores as medium-sized GMS, such as supermarkets that compete directly with large discount stores, are driven away from the neighborhood. The coefficient in Column (3) indeed indicates that the entry of large discount stores decreases the employment in medium-sized GMS, possibly driven by the closing down of supermarkets. While the entry of a large discount store has a negative effect on medium-sized GMS, it has a small, positive employment effect on medium-sized non-GMS. This finding suggests that, among the same GMS industry group, large discount stores mainly compete with medium-sized supermarkets rather than mom-and-pop grocery stores. Furthermore, the positive effect on small and medium-sized non-GMS suggests that the role of a large discount store as an anchor store may be more important for specialized stores.

5.3 Robustness

To assess the robustness of the employment effect of the entry of a large discount store, we examined a variety of alternative regression specifications and sample selections. We report three results in this section. First, we use the sample of counties with a population of 50,000 or over. Second, we restrict the sample of large discount stores offering a relatively homogeneous product mix and pricing strategies. Finally, we perform falsification exercises of estimating the effects of the entry of a large discount store in order to deal with possible endogeneity issues. A wide range of robustness checks produce qualitatively similar results.

[Table 7 about here]

First, we considered a subsample that includes counties with at least 50,000 people. The results in the previous section are based on the sample that includes all counties in Korea. One important

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characteristic that must be considered in such analysis is that approximately 70% of the area of South Korea comprises mountains and uplands. Counties in mountainous areas or islands have a relatively small population and may not be sufficiently large to host a large discount store. Among the 215 counties in the sample, there are 30 counties with a population of less than 50,000 people and only 2 of these have at least one large discount store. We excluded these small counties from the sample and repeated the same specification as that presented in Table 3. The results based on this new sample are reported in Table 7. Because the previous specifications include county-fixed effects, we do not expect that the results would change. The magnitude of the coefficients is slightly larger than those given in Table 3, but it is not very different.

[Table 8 about here]

In the analysis presented in the previous section, seven brands of large discount stores were included. Among these seven brands that are classified as large discount stores, the three largest brands—E-mart, Homeplus, and Lotte Mart—account for approximately 80% of the market share. These three marts, also known as the Big Three, have pursued different strategies than those of Wal-Mart or Carrefour in terms of packaging and displaying of goods. Moreover, while some of the brands focus on a small set of products such as agricultural products (Hanaro), these three marts encompass a wider range of products. Given that these three brands have relatively larger chains than other brands and have obtained oligopolistic positions since the acquisition of Carrefour and Wal-Mart, we examined the employment effect of the entry of these three brands separately. It is evident from Table 8 that the employment effects were relatively larger when a large discount store of one of these three brands entered the county. The larger employment effect is due to the fact that the Big Three employ more workers than other large discount stores (i.e., larger own-effect). However, the difference was not statistically significant.

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In order to address the endogeneity issue, we conducted a falsification exercise of estimating the entry effect of large discount stores. To perform a falsification test, we estimated the entry effect of large discount stores on county-level non-retail employment. If large discount stores choose to enter counties that are undergoing an increase in their general employment, our positive estimated effect might be spurious. Thus, we focused on changes in the employment in the manufacturing industry, which is correlated with general employment increases in the county, but is not affected by the entry of a large discount store. We chose professional and business service industries (i.e., lawyers, accounting, building cleaning, and help supply services) to conduct the falsification test using service industries. We do not consider the employment in the entire service industry because some service industries such as restaurants and personal services may be positively or negatively affected by the entry of large discount stores.

As evident in Panel A of Table 9, we do not find any significant effect of the entry of large discount stores on the employment in the manufacturing industry in the county. We repeated the analysis for the Big Three and counties with a population of over 50,000 people. Although they are not statistically significant, the entry of large discount stores has a negative effect on employment in the manufacturing industry in the county. In Panel B, we report the results for the business services sector. While the estimates are positive, none of these are statistically significant. These findings provide additional support that our primary finding of the positive employment effect of the entry of large discount stores is not spurious.

6. Conclusion

In this study, we found that the entry of large discount stores in a particular county in Korea lead to an increase in the retail employment in the county. Approximately two-thirds of such an increase in employment is accounted for by the entry of large discount stores themselves. The employment loss in

medium-sized GMS suggests that employment in the Korean retail sector has shifted from supermarkets to large discount stores, a pattern similar to the US retail industry. Furthermore, we found that employment in small, specialized stores increased in the affected county.

Although determining which industries benefited from the entry of large discount stores would require further investigation, the positive employment effect on small and medium-sized non-GMS suggests that a spillover effect may exist that is caused by the entry of a large discount store in a county or town. The reason for such a positive effect may be that a large discount store provides the infrastructure necessary to create a retail hub or center that attracts a number of specialized shops in the neighborhood.

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Figure 1. Location of Large Discount Stores, 1995–2010

1995

2000

2005

2010
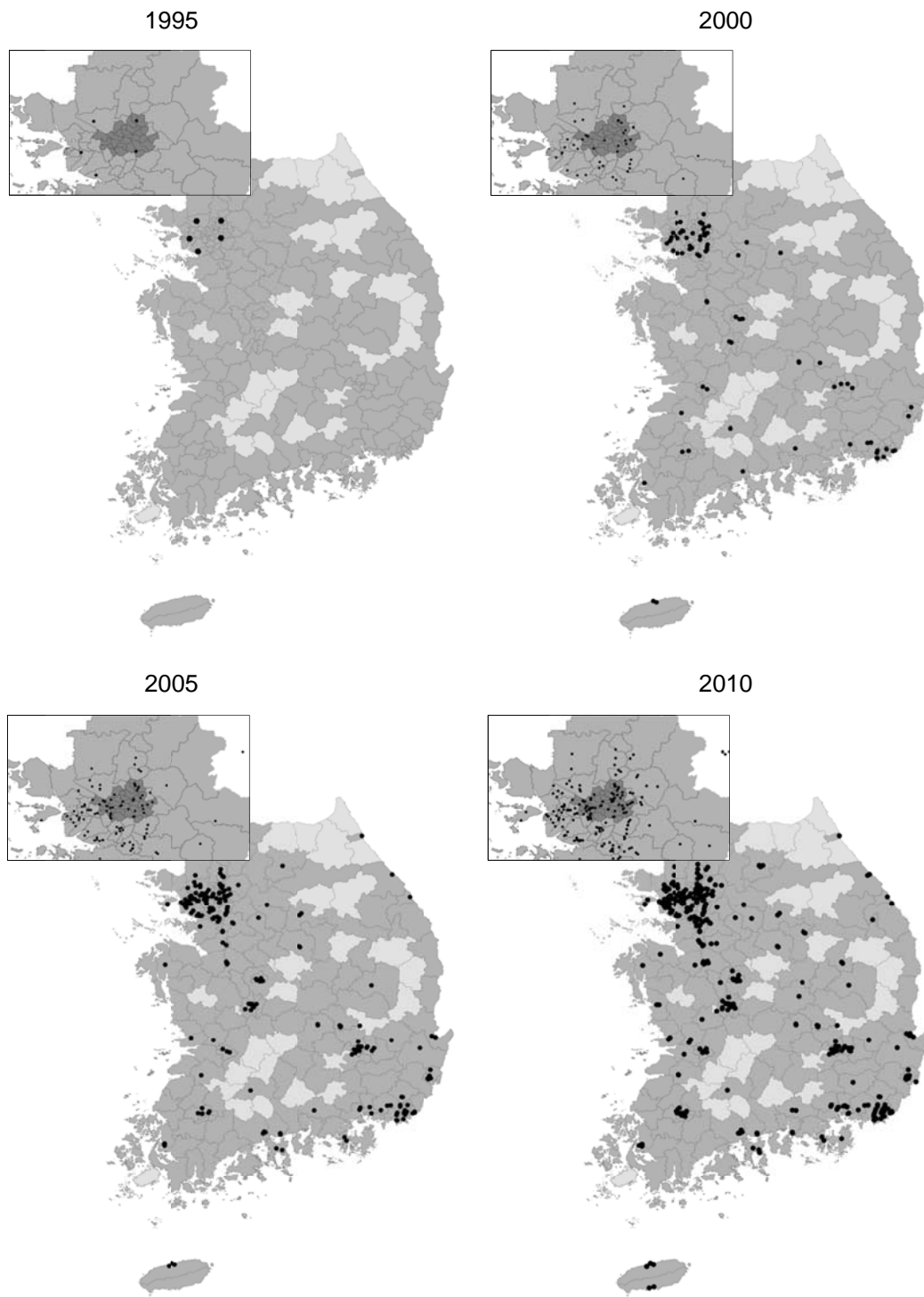
Notes: Each area represents a county in Korea. Counties with fewer than 50,000 people are in light gray. Seoul metropolitan area is enlarged in the upper left box. Each dot represents the location of a large discount store.

Figure 2. Changes in Retail Employment Structure

Panel A. Total Retail
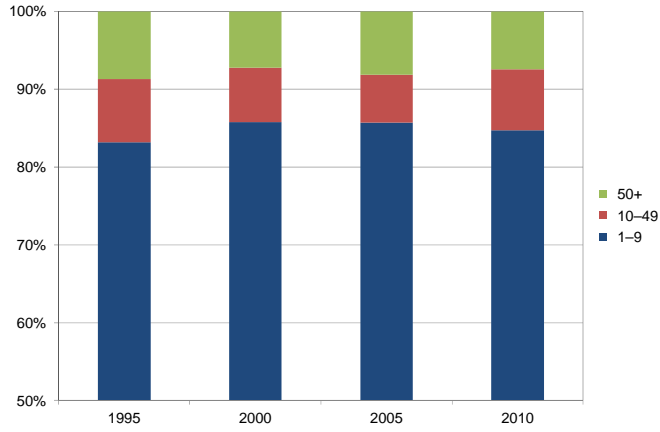
Panel B. General Merchandise Store (GMS)

Panel C. Non–GMS

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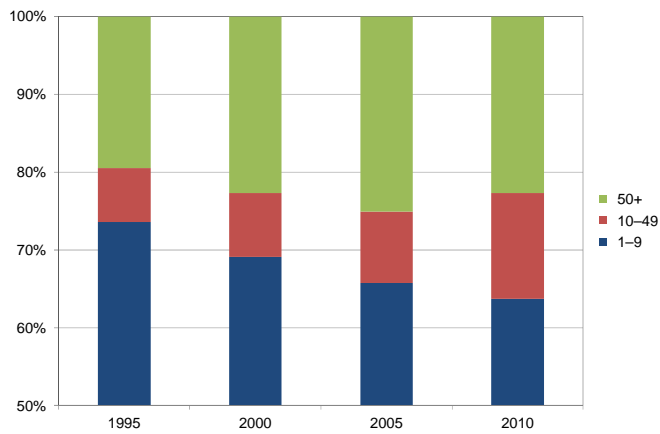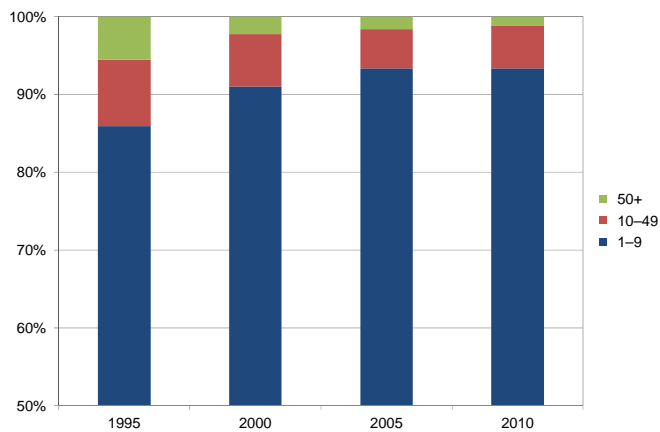
Table 1. Changes in Retail Employment Structure

	1995		2000		2005		2010	
Total Retail								
1–9	1,214	(83.1)	1,160	(85.7)	1,014	(85.8)	1,054	(84.7)
10–49	119	(8.2)	95	(7.1)	73	(6.2)	97	(7.8)
50+	127	(8.7)	98	(7.2)	96	(8.1)	93	(7.5)
	1,461	(100)	1,354	(100)	1,182	(100)	1,244	(100)
GMS								
1–9	245	(73.6)	228	(69.1)	215	(65.8)	230	(63.7)
10–49	23	(7.0)	27	(8.1)	30	(9.0)	49	(13.6)
50+	65	(19.4)	75	(22.8)	82	(25.2)	82	(22.8)
	333	(100)	330	(100)	327	(100)	361	(100)
Non-GMS								
1–9	969	(85.9)	932	(91.1)	799	(93.4)	824	(93.3)
10–49	96	(8.5)	69	(6.7)	43	(5.0)	48	(5.4)
50+	63	(5.6)	23	(2.2)	14	(1.6)	11	(1.3)
	1,128	(100)	1,024	(100)	856	(100)	883	(100)

Notes: All numbers are in 1,000 workers. Numbers in parentheses are the employment share of each retail size category. Numbers may not sum to total due to rounding.

Table 2. Summary Statistics: Country-Level Retail Employment and Population

	Mean	Median	SD	Min	Max
Retail Employment					
Total Retail	3,361	1,998	3,330	262	37,364
Large GMS	99	0	303	0	5,305
Other Retail	3,261	1,977	3,140	262	33,702
1–9	3,013	1,900	2,728	262	18,129
GMS	688	530	472	63	2,794
Non-GMS	2,325	1,379	2,284	87	15,689
10–49	190	89	313	0	6,120
GMS	72	47	79	0	657
Non-GMS	118	35	262	0	5,523
50+ Non-GMS	44	0	274	0	8,809
Population	130,368	78,600	118,125	9,191	674,577

Table 3. Estimated Effects of Large Discount Store Entry on Retail Employment

	(1) Total Retail	(2) Large GMS	(3) Other Retail
Entry	15.209***	9.897***	5.312***
	(2.452)	(1.128)	(1.998)
Employment effect			
Number of workers	198.28	129.03	69.25
% of average retail employment	5.9	129.89	2.12
Adj. R-squared	0.582	0.144	0.686
Sample size	2,110	2,110	2,110
Numbers of counties	215	215	215

Notes: Difference-in-differences regressions in all columns include both county and year dummies and also include interactions between country dummies and calendar year. The dependent variable is county-level retail employment per ten-thousand population. The entry variable takes 1 if a large discount store enters a country for the first time, otherwise zero. Employment effects as % of average retail employment are calculated by estimated effects of changes in number of workers divided by the average employment for the retail industry defined by each dependent variable. The sample includes 2,110 observations for 215 counties from 1997 to 2010. Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 4. Dynamic Effects of Large Discount Store Entry on Retail Employment

Panel A. Total Retail

	(1)	(2)	(3)	(4)	(5)
Entry (*t*+2)		-1.612			-0.851
		(2.542)			(3.229)
Entry (*t*+1)	-0.236	1.776			1.928
	(2.294)	(2.028)			(2.295)
Entry	15.511***	13.618***	12.569***	11.834***	11.854***
	(2.446)	(2.379)	(3.056)	(3.846)	(2.944)
Entry (*t*–1)			6.068**	5.606*	4.725*
			(3.073)	(3.167)	(2.666)
Entry (*t*–2)				2.641	2.341
				(3.462)	(3.108)
Adj. R-squared	0.554	0.550	0.537	0.496	0.536
Sample size	1,992	1,944	2,091	2,081	1,957
Numbers of counties	204	188	212	203	176

Panel B. Large GMS

	(1)	(2)	(3)	(4)	(5)
Entry (*t*+2)		-1.317			-1.884
		(1.113)			(1.481)
Entry (*t*+1)	-2.162**	-1.190			-1.925*
	(0.976)	(0.872)			(1.017)
Entry	10.765***	9.899***	10.850***	11.359***	8.874***
	(1.177)	(1.182)	(1.615)	(2.148)	(1.496)
Entry (*t*–1)			-0.439	0.334	0.216
			(1.951)	(2.077)	(1.349)
Entry (*t*–2)				-0.000	1.239
				(2.372)	(1.921)
Adj. R-squared	0.102	0.038	0.153	0.071	0.093
Sample size	1,992	1,944	2,091	2,081	1,957
Numbers of counties	204	188	212	203	176

[Table 4 continued]

Panel C. Other Retail

	(1)	(2)	(3)	(4)	(5)
Entry (*t*+2)		-0.294			1.033
		(2.161)			(2.506)
Entry (*t*+1)	1.926	2.966			3.853*
	(2.205)	(2.060)			(2.203)
Entry	4.747**	3.718*	1.719	0.475	2.980
	(1.950)	(1.988)	(2.510)	(3.045)	(2.352)
Entry (*t*–1)			6.507***	5.272**	4.508**
			(2.333)	(2.166)	(2.258)
Entry (*t*–2)				2.641	1.102
				(1.904)	(1.943)
Adj. R-squared	0.669	0.668	0.658	0.645	0.671
Sample size	1,992	1,944	2,091	2,081	1,957
Numbers of counties	204	188	212	203	176

Table 5. Effects of Large Discount Store Entry on Retail Employment: Estimates by Establishment Size in Other Retail

	(1) Small (1–9)	(2) Medium (10–49)	(3) Large (50+)
Entry	4.272**	0.146	0.610
	(1.820)	(0.651)	(0.618)
Employment effect			
Number of workers	55.69	1.90	7.95
% of average retail employment	1.85	1.00	18.04
Adj. R-squared	0.723	0.363	0.353
Sample size	2,110	2,110	2,110
Numbers of counties	215	215	215

Notes: Retail employment in column (1) is the total employment of establishments with 1–9 workers in the other retail sector excluding the large GMS. Retail employment variables in columns (2) and (3) are similarly defined using establishments with 10–49 and 50 or more, respectively.

Table 6. Effects of Large Discount Store Entry on Small and Medium Retail Employment: Estimates by Industry

	Small (1–9)		Medium (10–49)	
	(1) GMS	(2) Non-GMS	(3) GMS	(4) Non-GMS
Entry	0.283	3.989**	-0.869**	1.015*
	(0.497)	(1.568)	(0.349)	(0.550)
Employment effect				
Number of workers	3.69	52	-11.33	13.23
% of average retail employment	0.54	2.24	-15.65	11.23
Adj. R-squared	0.782	0.644	0.467	0.355
Sample size	2,110	2,110	2,110	2,110
Numbers of counties	215	215	215	215

Table 7. Effects of Large Discount Store Entry on Retail Employment: Counties with 50,000 Population or More

	(1) Total Retail	(2) Large GMS	(3) Other Retail
Entry	15.810***	9.985***	5.825***
	(2.528)	(1.160)	(2.017)
Employment effect			
Number of workers	243.44	153.75	89.69
% of average retail employment	6.13	124.88	2.33
Adj. R-squared	0.549	0.138	0.679
Sample size	1,701	1,701	1,701
Numbers of counties	185	185	185

Table 8. Effects of Three Major Discount Store Entry on Retail Employment

	(1) Total retail	(2) Large GMS	(3) Other Retail
Entry of 3 major stores	16.030***	10.622***	5.408**
	(2.659)	(1.235)	(2.086)
Entry of other stores	-5.833	-5.152	-0.681
	(6.386)	(4.697)	(5.946)
Employment effect			
Number of workers	208.98	138.45	70.5
% of average retail employment	(6.22)	(139.37)	(2.16)
Adj. R-squared	0.582	0.144	0.685
Sample size	2,110	2,110	2,110
Numbers of counties	215	215	215

Table 9. Falsification Tests of Large Discount Store Entry Effects on Manufacturing and Services Employment

Panel A. Manufacturing

	(1) standard model	(2) 3 major stores	(3) with 50,000 pop or more
Entry	-1.363	-3.562	-3.091
	(12.125)	(13.363)	(12.790)
Entry of other stores		15.637	
		(27.902)	
Adj. R-squared	0.824	0.824	0.823
Sample size	2,110	2,110	1,701
Numbers of counties	215	215	185

Panel B. Business Services

	(1) standard model	(2) 3 major stores	(3) with 50,000 pop or more
Entry	3.883	2.320	3.302
	(4.302)	(4.024)	(4.687)
Entry of other stores		11.114	
		(19.031)	
Adj. R-squared	0.810	0.810	0.812
Sample size	2,110	2,110	1,701
Numbers of counties	215	215	185

Appendix

Table A. Numbers of Large Discount Stores in Korea

	E-mart	Lotte-Mart	Homeplus (Tesco)	Homever (Carrefour)	Wal-Mart	Aram	Hanaro
1993	1	0	0	0	0	0	0
1994	2	0	0	0	0	0	0
1995	4	0	0	0	0	0	1
1996	6	0	0	3	1	0	1
1997	9	0	1	3	2	0	2
1998	13	2	1	6	2	1	6
1999	19	6	2	11	3	2	10
2000	27	13	7	19	4	2	12
2001	41	20	14	21	7	3	15
2002	50	28	21	24	13	3	17
2003	59	31	28	28	13	3	21
2004	69	35	31	28	14	3	22
2005	79	42	40	30	14	withdraw	23
2006	101	50	51	31	withdraw		25
2007	108	56	64	33			27
2008	117	63	111	withdraw			27
2009	124	69	114				27
2010	131	90	121				28
2011	135	92	123				28
Notes for M&A			Homeplus (2008)	E-mart (2006)	Homeplus (2005)		

Table B. Counties Entered by Large Discount Stores in Korea

Year	Whole sample (n=249)		DID estimation sample (n=215)	
	Numbers of Counties	Percentages of counties	Numbers of counties	Percentages of counties
1993	1	0.4		
1994	2	0.8		
1995	5	2.0		
1996	10	4.0		
1997	15	6.0	0	0
1998	27	10.8	11	5.1
1999	43	17.3	27	12.6
2000	64	25.7	44	20.5
2001	83	33.3	58	27.0
2002	96	38.6	69	32.1
2003	104	41.8	77	35.8
2004	112	45.0	83	38.6
2005	119	47.8	89	41.4
2006	131	52.6	100	46.5
2007	139	55.8	107	49.8
2008	148	59.4	116	54.0
2009	151	60.6	119	55.3
2010	153	61.4	121	56.3