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How does the entry of large discount stores increase retail employment? Evidence from Korea ☆

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ABSTRACT

Cho, Janghee, Chun, Hyunbae, and Lee, Yoonsoo—How does the entry of large discount stores increase retail employment? Evidence from Korea

The Korean retail sector has undergone significant structural changes in conjunction with the rapid expansion of big-box stores since the mid-1990s. Using county-level data from Korea in 1997–2010, we examine the effects of the entry of large discount stores on local retail employment. Based on a differences-in-differences approach, our analysis shows that the entry of a large discount store leads to an increase of approximately 200 retail jobs in the county. Two thirds of this gain is attributable to the entry of the large store itself, and the other third is a result of 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. 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 county employment. Such a finding of positive employment effects is in sharp contrast to previous findings on the employment effect of large retail chains, based primarily on the expansion of Wal-Mart in the US. While Wal-Mart competes with incumbent chain stores, large discount stores—the first nationwide large-scale chains introduced in Korea—may play the role of anchor stores. By providing modern shopping infrastructure and attracting new small stores into neighborhoods, these large discount stores have transformed local retail sectors from traditional shopping environments. *Journal of Comparative Economics* **43** (3) (2015) 559–574. Department of Economics, Sogang University, Seoul 121-742, Korea.

1. Introduction

The diffusion of big-box stores operated by national or multinational companies has dramatically changed the global retail industry over previous decades. Because these large discount stores provide a wide range of products at relatively low prices, they have rapidly gained popularity and played an increasing role in most developed, as well as developing, economies. Researchers show that the growth of big-box stores has contributed to increases in consumer welfare

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(Hausman and Leibtag, 2007), productivity gains in the retail sector (Foster et al., 2006), and product upgrading among upstream manufacturers (Iacovone et al., 2011). However, there has been concern that the expansion of big-box stores does not lead to employment growth in the retail industry. In particular, these large discount stores have been criticized for driving out small family-owned retail stores and destroying traditional retail districts.

The impact of large discount 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 large discount stores, represented by Wal-Mart, create or destroy jobs. So far, most studies have focused on the effects of Wal-Mart stores on local retail employment in the US (Basker, 2005; Neumark et al., 2008), but these studies have not yet reached a consensus on the employment effect of Wal-Mart. Moreover, most previous studies have focused on net employment change at the location level (e.g., county level). Such analysis of net change in the location level of employment may mask potentially important reallocations among various types of retailers.

This study provides new evidence of the impact of large discount stores on local retail employment in Korea 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 dataset on county-level retail employment by detailed industry, establishment size, and both industry and size. We examine the role of substitutability and complementarity,[2] along with size, in explaining the effect of the entry by a large discount store on local employment.

The entry of a large discount store entails structural change in the local retail industry. An increase in price competition may lead not only to restructuring *within* an existing store,[3] but also to change in the composition of retailers in the industry, thereby driving unsuccessful stores out of the market. The impact of such changes varies across industries within the retail sector, depending on the products they 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 versus medium-sized supermarkets) and industries (e.g., general merchandise stores (GMS), such as supermarkets, versus 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. 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 dataset is sufficiently rich to explore which types of stores are more vulnerable to the entry of large discount stores.

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. There is mixed evidence among studies that utilize establishment-level micro data regarding whether the entry of large discount stores has a negative impact on small retailers. Haltiwanger et al. (2010) find that the entry of big-box stores has a substantial, negative impact on small chains and local mom-and-pop 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 is consistent with their findings that the impact of entry by large discount stores is largest among stores that compete directly 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 thanks to the closing of medium-sized supermarkets.[4] In addition, while small, traditional mom-and-pop stores in the immediate area were affected directly, such a negative effect could be dwarfed by openings of new convenience stores. By operating for longer hours than large discount stores, these convenience stores provide 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 by large discount stores and enable the small stores to survive in the changing environment.

Furthermore, we find that employment in small specialized stores (i.e., non-GMS) increases in the county in which 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. In a study examining the impact of discount store entry on local supermarkets, Zhu et al. (2011) show that the entry generates positive demand externalities for incumbents located in the same shopping plaza by attracting consumers. However, it is worth noting that the positive externalities created by the entry of large discount stores in Korea is not merely limited to an increase in traffic.[5] Large discount stores provide convenient, modern

[1] The studies include Jia (2008) and Sobel and Dean (2008) for the US, Rivero and Vergara (2008) for Chile, Igami (2011) for Japan, and Schivardi and Viviano (2011) for Italy.

[2] For example, Zhu et al. (2011) provide a theoretical model showing the trade-off between the business stealing effect and positive demand externality effect, depending on the degree of product differentiation between the entrants and incumbents.

[3] For example, competition from Wal-Mart increases the incumbents' product quality through better inventory management (Matsa, 2011).

[4] This finding is consistent with Sadun (2014) in the sense that a large discount store may not directly compete with small stores. Sadun (2014) finds that small independent retailers are harmed by the introduction of entry barriers against large stores, as large retailers substitute large shops with smaller in-town formats that compete more directly with small incumbents.

[5] Pashigian and Gould (1998) find that well-known anchor stores draw customer traffic, indirectly increasing the sales of lesser-known stores in the malls. Gould et al. (2005) find that rental contracts are written to price positive externalities to other stores.

shopping amenities, such as parking, indoor shopping areas with air conditioning or heating, and food courts, which are shared with small, specialized shops. In this sense, the role of a large discount store as an anchor is not directly comparable to that of anchor stores (e.g., department stores or national name-brand stores in the US.) as documented in Pashigian and Gould (1998) and Gould et al. (2005). The entry of large discount stores is accompanied by the build-up of modern shopping plazas, which attract small, specialized shops.

Such a different effect of the entry of 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 US, Wal-Mart, a nationwide large discount store, competes with local or regional chain stores. Existing chain stores with similar formats that provide similar services are 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.[6] These large discount stores were the first large-scale retail establishments in Korea, with nationwide store chains. They provided convenient shopping infrastructure, which attracted other specialized stores and customers. The demand for such a modern shopping technology has grown in Korea as the household income rapidly increased since 1980s. Moreover, the rapid rise of vehicle ownership since the early 1990s seems to have played an important role in the expansion of large discount stores (Lagakos, 2013).[7] The complementarity between large discount stores and specialized stores, which satisfied greater 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 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

A typical large discount store in Korea is a national retail chain selling food and general merchandise.[8] The store format is similar to a hypermarket or superstore because food products, including fresh food, comprise approximately 50% of store sales. 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 m^2 and hires 100–150 workers; products are displayed in an easy-to-spot manner rather than being piled up on shelves, which resembles Target Corp. rather than Costco in the US.[9]

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 of more than 3,000 m^2 and sells items at lower prices than small retail stores. Given that most social and political interest is 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 (of a total of 16 provinces in Korea). Therefore, we classify 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 national chains accounted for more than 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 with E-mart in 2006 and Aram Mart and Carrefour were merged with Homeplus in 2005 and 2008, respectively.[10]

Before large discount chain stores were introduced in the mid-1990s, the retail sector in Korea had been dominated for quite some time 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 and specialized retailers were established in Korea at the time when large discount stores were introduced.[11] This is in sharp contrast with the case of Wal-Mart, which 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 expanded rapidly all over the country.

Fig. 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 diffusion, most openings were observed in or near major cities, such

[6] Department stores that have nationwide chains are exceptions; however, these stores do not compete directly with local retailers because most are located in urban shopping districts and sell high-quality products.

[7] Lagakos (2013) argues that an increase in car ownership as well as the income level is important in adopting modern retail technology in developing countries.

[8] Descriptions of the diffusion of big-box stores and their impact on the structure of the retail sector are found in Jarmin et al. (2009) for the US. and Haskel and Sadun (2009) for the UK.

[9] This product display may reflect the preferences of Korean customers, as described in the Wall Street Journal (2006)—"Koreans hate the warehouse format."

[10] Not all foreign retail transnational corporations (TNCs) that enter Korea are 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 include a two-floor layout, product line selection, product display, and even the name "Homeplus"—all of which are attributable to existing Korean stores. In contrast, Carrefour and Wal-Mart adapted their operation processes and formats far less to Korean market conditions.

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

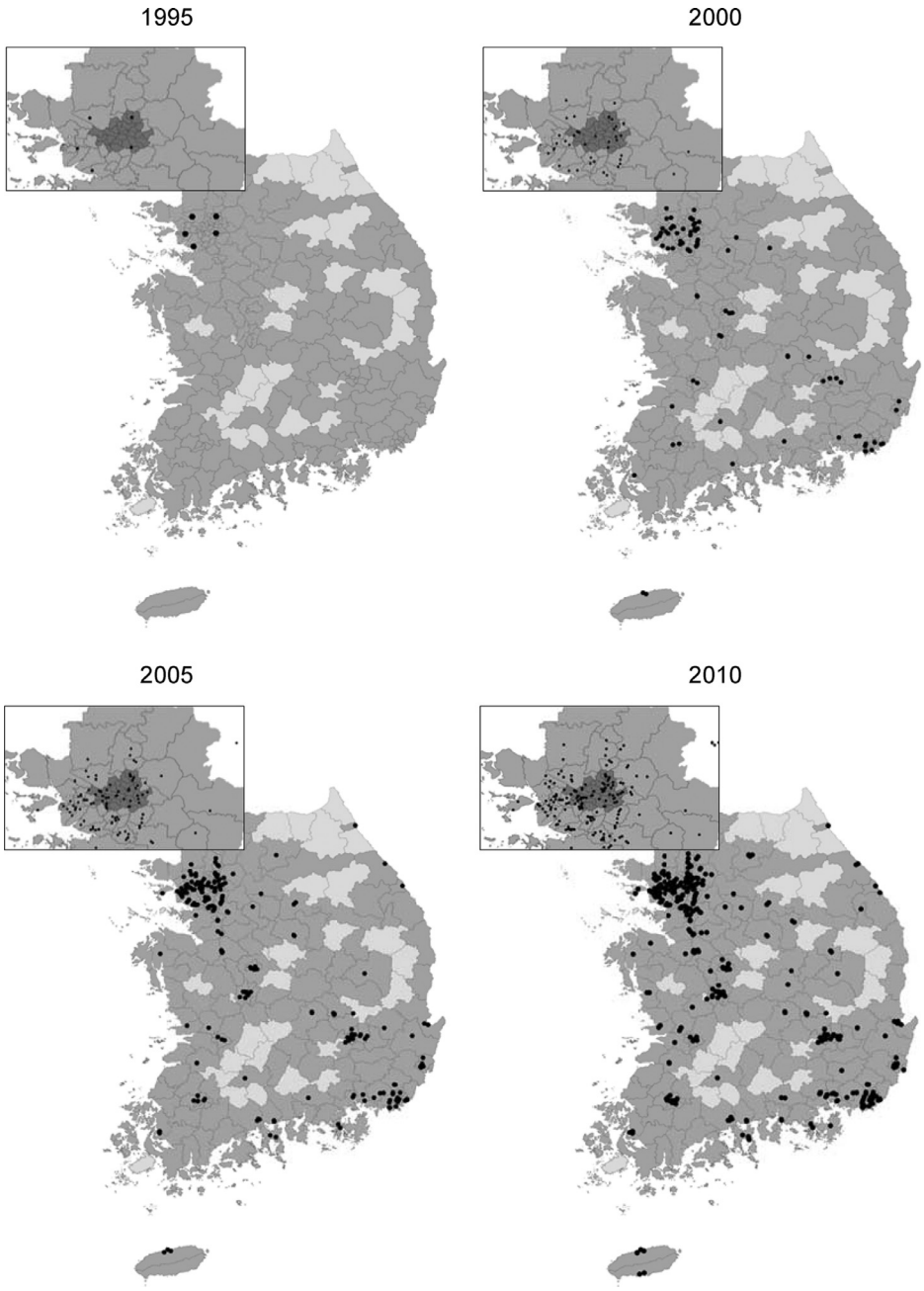

Fig. 1. Diffusion of large discount stores, 1995–2010.
Notes: Each area represents a county in Korea. Counties with less than 50,000 people are in light gray. Seoul metropolitan area is enlarged in the upper left box. Each dot represents the location of a large discount store. Scale: 1 cm = 100 km or 1:10,000,000.

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, more than 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 Fig. 1 indicate counties in mountainous areas with a population of less than 50,000 people. According to Lee et al. (2014), population is a key factor in determining demand for the large discount retail industry. No discount stores are found to enter counties that have a population of less than 50,000 people (except for two counties). In 2010, large discount stores were operating in more than 80% of counties with a population of more than 50,000 people. This confirms that the growth of national retail chain stores has been one of the key features of the evolution of the Korean retail industry during the past 2 decades.

Table 1
Changes in retail employment distribution.

	1995		2000		2005		2010	
Total Retail								
1–9	1214	(83.1)	1160	(85.7)	1014	(85.8)	1054	(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)
	1461	(100)	1354	(100)	1182	(100)	1244	(100)
GMS (General merchandise store)								
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)
	1128	(100)	1024	(100)	856	(100)	883	(100)

Notes: All numbers are in 1000 workers. Numbers in parentheses are the employment share of each retail size category. Numbers may not sum to total because of rounding.

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. In 2010, the retail sector included approximately 0.6 million establishments that accounted for approximately 20% of the total number of establishments in the Census. This survey includes information on store-level employment with detailed location and industry. Using raw establishment-level data, we construct 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, use county-level data to analyze the impact of such stores on the local labor market (Basker, 2005; Neumark et al., 2008). Given the social and economic interest on the impact of national chain stores on the local retail industry, we choose 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 versus medium-sized supermarkets) and industry groups (e.g., GMS (General Merchandise Stores), such as supermarkets, versus non-GMS specialized shops, such as bakeries and clothing stores).

According to the Korea Standard Industry Classification (KSIC), there are 57 detailed five-digit industries in the retail sector. Under Total Retail, we include all retail stores except used-good stores and no-store retailers (i.e., online-only stores). It is important to distinguish the spillover effect of the entry of large retail chain stores on other retail industries from the direct effect on the industry to which large discount stores belong. We divide Total Retail into two sub-groups: (i) Large GMS, including large discount stores and department stores, and (ii) Other Retail, including small GMS of 1–9 employees and medium-sized GMS of 10–49 employees (mom-and-pop groceries, convenience stores, and supermarkets) as well as all non-GMS stores (e.g., clothing, electronics, and butcher shops).

Along with the rapid expansion of large discount stores, the retail sector in Korea has undergone significant structural changes. Fig. 2 and Table 1 illustrate changes in employment distribution across three size 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. In the GMS sector, the importance of large establishments increased as large discount stores expanded. On the other hand, the share of employment in small 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 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 DID model of the following form:

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

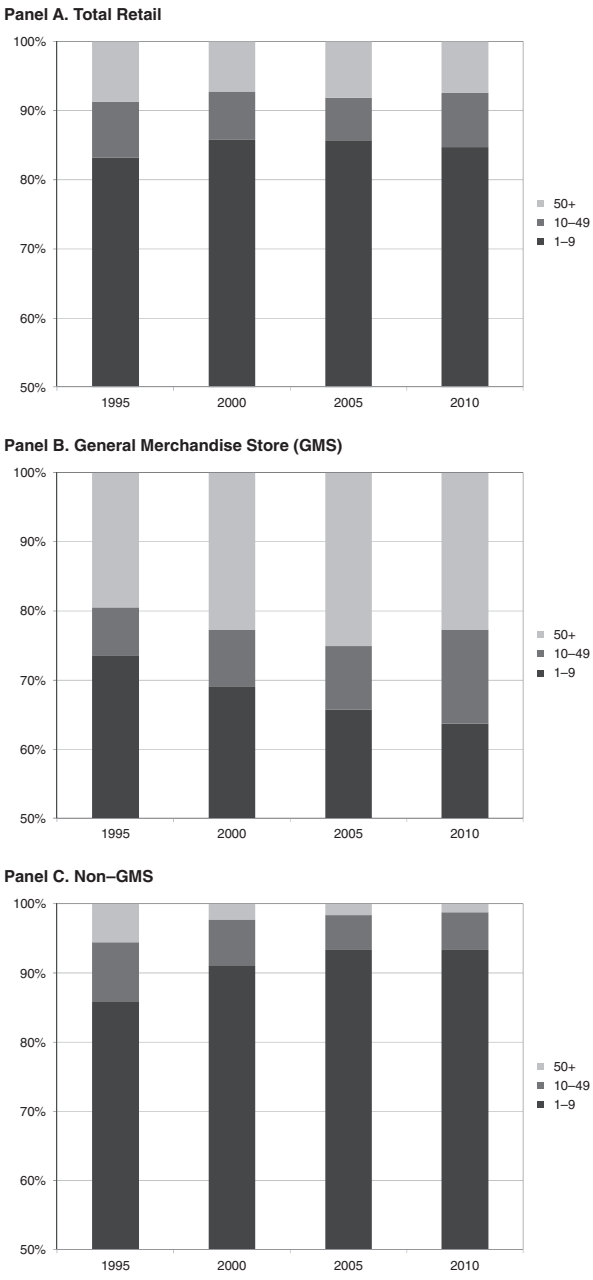

Fig. 2. Changes in retail employment distribution.

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.[12] The DID model includes the county fixed effect, μ_i, year fixed effect, η_t, and county-specific linear time trend, $\mu_i \text{Trend}_t$. 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, it is essential to include the county-specific trend in the model because it controls for heterogeneous trends among counties, particularly for some newly developed towns that underwent rapid growth in both retail employment and population.

[12] In the baseline specification that focuses on the short-run effect of the entry, we drop post-entry years for counties entered by a large discount store in order to avoid potential bias that may occur in the event of a structural change in DID estimation. Note that our estimated effect is based on a comparison with the pre-entry employment level. We expand the sample to include all post-entry years in Subsection 5.2, in which we focus on the long-run effect and explicitly consider a possible structural change. In the new specification, we keep the entry dummy variable equal to 1 for all post-entry years in order to assess the long-run effect of the entry.

Table 2
Summary statistics: County-level retail employment and population.

	Mean	Median	SD	Min	Max
Retail employment					
Total Retail	3361	1998	3330	262	37364
Large GMS	99	0	303	0	5305
Other Retail	3261	1977	3140	262	33702
1–9	3013	1900	2728	262	18129
GMS	688	530	472	63	2794
Non-GMS	2325	1379	2284	87	15689
10–49	190	89	313	0	6120
GMS	72	47	79	0	657
Non-GMS	118	35	262	0	5523
50 + Non-GMS	44	0	274	0	8809
Population	130368	78600	118125	9191	674577

We use county-clustered standard errors to address a possible serial correlation within a county. As indicated by Bertrand et al. (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 correlation among counties within a province, we also use province-year clustered standard errors; however, the obtained results are qualitatively the same.

We consider a model with 1- and 2-year leads because the mere 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). In addition, we estimate the model with lags to account for the lagged effect of the 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:

$$\left(\frac{\text{Emp}}{\text{Pop}}\right)_{i,t} = \alpha + \beta \text{Entry}_{i,t} + \sum_{\tau}^{2} \gamma_\tau \text{Entry}_{i,t+\tau} + \sum_{\tau}^{2} \emptyset_\tau \text{Entry}_{i,t-\tau} + \mu_i + \eta_t + \mu_i \text{Trend}_t + \varepsilon_{i,t} \quad (2)$$

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 in Section 2, large discount stores first appeared in Korea in 1993, but were diffused in less than 5% of counties before 1997. Furthermore, no chain of discount stores satisfies our criteria of national chains (i.e., operating in three or more provinces) until 1997.[13] Thus, we choose a sample period from 1997 to 2010.[14] Because 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 exclude counties with large discount stores in 1997 (the first pre-treatment year in the panel dataset). In addition, we use the indicator variable of store opening in our DID model because the entry effect cannot be estimated with a different number of stores. Therefore, we exclude counties in which two or more stores enter in the same year. Furthermore, we exclude the post-treatment observations (i.e., post-entry years) of treatment counties because another store may enter the treatment counties after the treatment year. By excluding post-entry years, this specification allows us to focus on the short-run effect of the entry rather than the long-run effect.

While exploration of the permanent effect of large discount store entry is interesting and important, an examination of long-run "net" employment change may mask the structural changes that immediately follow the entry (e.g., decline of traditional supermarkets and growth of new, specialized stores around the large discount store). We separately examine the long-run effect of the entry, based on the full sample, in Subsection 5.2, where we explicitly consider the possibility of a structural change after the entry of a large discount store. In addition, we exclude the three counties in which more than 20% of employment is created by the retail industry in retail hubs in the three largest metropolitan areas—Seoul, Busan, and Daegu. Finally, the sample includes 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.

5. Results

5.1. Main results

Estimates of Eq. (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 are

[13] Since Korea opened its retail industry to foreign companies in 1996, foreign retailers started to enter the Korean market, for example, Makro in 1996, Carrefour in 1996, and Wal-Mart in 1998 through the acquisition of Makro.

[14] When we extend the sample period to include the years between 1994 and 1996, we find that the estimates are somewhat larger than the baseline estimates (i.e., between 1997 and 2010) but the results are qualitatively similar. We believe that deregulation, which occurred during this time period, may also have some effects on retail employment, in addition to the entry of the large discount store itself.

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	2110	2110	2110
Numbers of counties	215	215	215

Notes: The dependent variable is county-level retail employment per 10,000 population. The entry variable takes 1 if a large discount store enters a county for the first time, and 0 otherwise. Employment effects as a percentage of average retail employment are calculated by the estimated changes in the number of workers divided by the average employment for the retail industry defined by each dependent variable. DID regressions in all columns include both county and year dummies and county-specific time trends. The sample includes 2110 observations for 215 counties from 1997 to 2010. Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * is significant at the 10% level; ** is significant at the 5% level; and *** is significant at the 1% level.

calculated using the coefficient and mean population (reported in the column "Employment Effect" in each Table). For example, the coefficient 15.2 implies that retail employment increased by approximately 198 workers more in the county in which a new large discount store was opened than in other counties. This effect includes the increase in employment due to the entry of a 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 the own effect of large discount stores, we separately examine the employment effect in the following two sub-groups: (i) Large GMS, to which large discount stores belong, and (ii) Other Retail, including small and medium-sized GMS and all specialized stores (i.e., non-GMS).

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 a 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 grocers, is negative or positive has been a key question among researchers focusing 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 increases more in counties in which a large discount store was opened (approximately 70 employees more).[15,16]

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. Considering that competitors may have information regarding the entry of a large discount store in advance (e.g., 1 or 2 years before the opening date), there is a possibility that retail stores in the county respond even before the large discount store enters by relocating or changing the scale of the store in expectation of increased competition. On the other hand, if 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 1- and 2-year leads and lags.

Overall, the timing of a change in employment in the retail industry appears to coincide with the entry of a large discount store. As evident from panel A of Table 4, the coefficients on the leads of entry are not statistically significant for the entire retail industry. Retail employment per capita increased within a year of entry but the estimated effect was not significant after 2 years. In panel B, we examine the dynamics of employment change in the subgroup of Large GMS. The coefficient of a 1-year lead is negative and statistically significant, thereby providing some evidence of an anticipatory response to the entry of large discount

[15] While the effect on employment is expected to be constant across counties, the estimated effect may have large standard errors if counties differ significantly in terms of population. When there is a substantial difference in population between counties, it may not be appropriate to use the mean population in converting the coefficient into the number of employees. We believe that such an issue is more likely to occur among counties with relatively small populations. One method to avoid such a measurement issue is to scale the entry variable in the right hand side of the regression by dividing it by the population (i.e., Entry/Pop), in a similar way to scale the employment variable in the left hand side. In this specification, the coefficient can be interpreted directly as the effect on the number of workers. We find that the results are qualitatively similar: the employment effect is 169.3 workers for Total Retail compared to the baseline result of 198.3 workers, as reported in Table 3. An alternative method to avoid such a measurement issue is to drop the small counties, which may cause large standard errors in the estimates. When we limit the sample to counties with populations of more than 50,000, the difference is much smaller (231.5 workers when Entry/Pop is used versus 243.4 workers in the baseline model). We report the results for this subsample (i.e., counties with at least 50,000 people) in Table 9 of Subsection 5.4.

[16] As indicated by Neumark et al. (2008), the positive employment effect does not necessarily indicate an increase in the absolute level of employment. In fact, there has been a decline in overall retail employment in Korea. It is worth noting that 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
Dynamic effects of large discount store entry on retail employment.

	(1)	(2)	(3)	(4)	(5)
Panel A. Total Retail					
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	1992	1944	2091	2081	1957
Numbers of counties	204	188	212	203	176
Panel B. Large GMS					
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	1992	1944	2091	2081	1957
Numbers of counties	204	188	212	203	176
Panel C. Other Retail					
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	1992	1944	2091	2081	1957
Numbers of counties	204	188	212	203	176

Notes: Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * is significant at the 10% level; ** is significant at the 5% level; and *** is significant at the 1% level.

stores (column 1); some large GMS stores may have contracted 1 year before a large discount store entered the county. However, such an effect is relatively small and disappears once the indicator variable for the 2-year lead before the entry is included in the regression. In column (2), both the lead coefficients are shown to become statistically insignificant. In column (5), only the 1-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, the estimated employment growth in this subsector appears to have occurred with a lag, 1 year after the entry of a large discount store. However, there is no strong evidence of an anticipatory effect in this subsector.

The finding of a positive employment effect in Other Retail is important from the following two perspectives. First, 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 stores would destroy jobs in small stores in the area, the finding of

the positive effect on Other Retail is somewhat surprising. The finding implies that the substitutability between large discount stores and small GMS stores is lower than previously thought.[17]

Second, 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 1 year after a large discount store entered the county supports this view.

5.2. Long-run effect and structural change

In Subsection 5.1, by excluding post-entry years from the sample, we focus on the short-run effect of the first entry of a large discount store on local retail employment. While we find a positive short-run effect, caution is needed in interpreting the result because our short-run estimate is based on a comparison to the pre-entry employment level. In this subsection, we move our focus to the long-run effect of the entry. Controlling for a possible structural change is important in assessing the long-run employment effect of a large discount store entry. Competitors eventually shut down but if this process takes some time, the positive short-run effect may consist of a spike in employment, which would eventually lead to a relative decrease in employment over a longer period. On the other hand, the entry of large discount stores may lead to the restructuring of local retail sectors away from traditional shopping environments toward modernized ones, thereby creating more jobs. We expect such transformation to be triggered by the first large discount store to enter the county, rather than by subsequent entrants. Once the first large discount store enters the local retail sector and the modernization process is initiated, the spillover effect caused by the entry of subsequent large discount stores may be relatively small.

In order to control for such a transformation process in retail employment over time, as well as any long-run effects of entry, we include the county-specific *post-entry* time trend, in addition to the first entry dummy variable.[18] In general, the DID method assumes that there is no change in the trend after the treatment. In addition, the DID method assumes the absence of any lagged effect, as well as any effect caused by a structural change. Given the structural change away from traditional stores to modernized ones, which started following the spread of large discount stores in Korea, it may be inappropriate to assume that no structural change occurred after the entry of a large discount store. If there was any structural change following the entry of the first large discount store in a given area, the change in the trend after the entry may bias the estimated short-run effect in the DID model.[19] The new specification explicitly considers the possibility that there may be a structural change after the entry of a large discount store. Moreover, we include the dummy variables of the second entry and the third or later entries in order to examine the effect of subsequent entries separately. Using the whole sample period, we estimate the following DID regression specification, which allows structural change after the entry of a large discount store:

$$\left(\frac{\text{Emp}}{\text{Pop}}\right)_{i,t} = \alpha + \sum_{j=1}^{3} \beta_j \text{Entry}_{j,i,t} + \mu_i + \eta_t + \mu_i \text{Trend}_t + \mu_i \text{Post\_Entry\_Trend}_t + \varepsilon_{i,t} \tag{3}$$

where $\text{Entry}_{j,i,t}$ ($j = 1,2,3$) are the first, second, and third entry dummy variables, respectively, and $\mu_i \text{Post\_Entry\_Trend}_t$ is a county-specific post-entry time trend. The Entry dummies are equal to 1 for all post-entry years so that we can assess the long-run effect of the entry.

The results in columns (1) and (2) of Table 5 suggest that both the Total Retail and Large GMS sectors show a significant, positive effect on local retail employment from the first and second entry, even after controlling for a structural change. However, Other Retail reported in column (3) shows that the first large discount store has a positive and statistically significant effect at the 5% level, but that the second and third entries do not have a significant effect. This confirms the conjecture that Other Retail begins to transform and create more jobs over time after the *first* entry of a large discount store. This finding is consistent with the lagged effect in Other Retail presented in panel C of Table 4.

5.3. Employment effects in other retail: results by size and industry

The results in Subsection 5.2 suggest that large discount stores may have a positive spillover effect on Other Retail, particularly on smaller shops. In this subsection, we divide the Other Retail category 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 6 presents the estimation results for each of the 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., small shops in Other Retail, with less than 10 employees) increased by approximately 56 jobs more in a county in which a large discount store opened.[20] This group includes specialized small shops (non-GMS), such as clothing and electronics, as well as small GMS, such as mom-and-pop grocery and convenience stores. In

[17] In a study examining the effect of regulating entry of large retail stores in the UK, Sadun (2014) finds that entry barriers against large stores may hurt small stores as large retailers substitute large stores with smaller ones that compete more directly with small, independent stores.

[18] Because this analysis includes the post-entry period in the sample, while our sample is extended to all county-year observations for the whole sample period, the sample size increases from 2,110 to 3,010. In contrast, when we apply the DID method in Subsection 5.1, the sample includes the pre-entry and entry periods, but excludes the post-entry periods.

[19] One way to avoid the issue is to drop post-entry years, which we do in the baseline model (1).

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

Table 5
Long-run effects of large discount store entry on retail employment.

	(1) Total Retail	(2) Large GMS	(3) Other Retail
1st LDS entry	14.685***	9.565***	5.121***
	(2.263)	(0.936)	(1.893)
2nd LDS entry	8.587***	8.353***	0.234
	(3.247)	(2.253)	(2.347)
3rd LDS entry	2.826	2.106	0.720
	(2.253)	(1.731)	(2.326)
Employment effect of 1st LDS entry			
Number of workers	262.66	171.07	91.59
% of average retail employment	5.83	75.71	2.14
Adj. R-squared	0.648	0.211	0.750
Sample size	3010	3010	3010
Number of counties	215	215	215

Notes: DID regressions in all columns include both county and year dummies, county-specific time trends, and county-specific post-entry time trends. Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * is significant at the 10% level; ** is significant at the 5% level; and *** is significant at the 1% level.

Table 6
Effects of large discount store entry on employment in Other Retail: estimates by establishment size.

	(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	2110	2110	2110
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 large GMS. Retail employment variables in columns (2) and (3) are similarly defined using establishments with 10–49 employees and 50 or more employees, respectively. Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * is significant at the 10% level; ** is significant at the 5% level; and *** is significant at the 1% level.

Table 7
Effects of large discount store entry on employment in small and medium size stores: 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	2110	2110	2110	2110
Numbers of counties	215	215	215	215

Notes: Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * is significant at the 10% level; ** is significant at the 5% level; and *** is significant at the 1% level.

addition, the employment effects on other size groups, namely, medium (10–49 employees) in column (2) and large (50 and more employees) in column (3), are positive but statistically insignificant.[21]

In Table 7, we further divide the small and medium-sized groups into GMS and non-GMS industries, respectively. We do not report the results for stores with more than 50 employees because they account for only approximately 1% of Other Retail and the estimated results for this subgroup are not statistically significant, as reported in Table 5. The results in column (2) suggest that

[21] The results are not driven by retailers crossing the size-class cut-off by growing or contracting.

the positive employment effect on small stores, reported in Table 5, is concentrated mainly 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 a 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 do not find any negative employment effect among small GMS in the county.

A possible explanation of this non-significant estimate is that small GMS stores compete with large discount stores in a different dimension, by operating for 24 h and providing easier access for "quick" shopping for just a few daily items, 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 (i.e., insulation effect). Indeed, the coefficient in column (3) indicates that the entry of large discount stores decreases the employment in medium-sized GMS, possibly driven by the closing down of supermarkets. In addition, there is a possibility that the negative employment effect of the entry is, at least partly, offset by employment growth due to increases in the number of new convenience stores. Unfortunately, our dataset does not permit us to examine within-store restructuring directly. However, a substantial number of traditional mom-and-pop grocers are known to have switched to modernized convenience stores (i.e., reallocation effect). We expect that such a reallocation process is more likely to occur in locations where traditional supermarkets or mom-and-pop grocers were driven away by the entry of large discount stores.

An alternative explanation is that small GMS that are located at a distance from large discount stores may not have been affected directly by the entry of large discount stores, even though small GMS that were located close to the large discount store were affected significantly. 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 and limited within a 2-mile radius of its location. Furthermore, Haltiwanger et al. (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 will be attenuated in our case as well. However, we do not expect that distance from the large discount store has 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 US.

Overall, we find that the entry of a large discount store has a negative effect on medium-sized GMS. However, 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 compete mainly with medium-sized supermarkets rather than small mom-and-pop grocery stores. 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.

5.4. Robustness

To assess the robustness of the employment effect of the entry of a large discount store, we examine various issues related to alternative regression specifications, endogeneity, and sample selection. First, we examine whether our finding of a positive employment effect is driven by unsuccessful multinational retail chains in the Korean market. Second, we use the sample of counties with a population of 50,000 or more. Third, we examine whether the increased employment may be the result of a shift in retail employment from neighboring counties to the county with a large discount store. 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 produces qualitatively similar results.

In order to exclude any possibility that a positive employment effect may be driven by specific retailers, in particular multinational retail chains that were unsuccessful in the Korean market, we drop 27 counties that these unsuccessful large discount stores (e.g., Wal-Mart and Carrefour) first entered. Moreover, the analysis focuses on the entry of the three largest chains—E-mart, Homeplus, and Lotte Mart.[22] When we examine the employment effect of these successful chains separately in Table 8, we find that the employment effects in the Total Retail and Large GMS categories are similar to the baseline results reported in Table 3.

In addition, we consider a subsample that includes counties with at least 50,000 people. The results in the previous subsections are based on the sample that includes all counties in Korea. One important characteristic that must be considered in such analysis is that mountains and highlands comprise approximately 70% of the area of South Korea. Counties in mountainous areas or islands have relatively small populations and may not be sufficiently large to host a large discount store. Among the 215 counties in the sample, there are 30 counties with populations of less than 50,000 people and only two of these have at least one large discount store. We exclude these small counties from the sample and repeat the same analysis as that presented in Table 3. The results based on this new sample are reported in Table 9. Because the previous specifications include county fixed effects, we do not expect the results to change. The magnitude of the coefficients is slightly larger than those given in Table 3, but is not very different.

While we observe a positive employment effect from the entry of a large discount store, such an increase in employment may be driven, in part, by the shift of employment from neighboring counties to the county that the large discount store entered. If

[22] Among these seven chains, which are included for the analysis in the previous section, these three largest chains account for approximately 80% of the market share. These retail chains, commonly known as the Big Three, have obtained oligopolistic positions since the acquisition of Carrefour and Wal-Mart.

Table 8
Effects of large discount store entry on retail employment: excluding counties entered by unsuccessful foreign large discount stores.

	(1) Total Retail	(2) Large GMS	(3) Other Retail
Entry	15.603***	10.282***	5.321**
	(2.581)	(1.158)	(2.075)
Employment effect			
Number of workers	189.45	124.84	64.61
% of average retail employment	6.08	153.43	2.13
Adj. R-squared	0.666	0.479	0.677
Sample size	1988	1988	1988
Numbers of counties	188	188	188

Notes: Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * is significant at the 10% level; ** is significant at the 5% level; and *** is significant at the 1% level. Of 215 counties, we drop 27 counties that are first entered by the unsuccessful foreign-brand large discount stores.

Table 9
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	1701	1701	1701
Numbers of counties	185	185	185

Notes: Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * is significant at the 10% level; ** is significant at the 5% level; and *** is significant at the 1% level.

Table 10
Effects of large discount store entry on retail employment: test for employment shift effects from neighboring counties.

	(1) Total Retail	(2) Large GMS	(3) Other Retail
Entry	14.668***	10.055***	4.613**
	(2.664)	(1.295)	(2.163)
Entry x small county	2.448	−0.714	3.162
	(6.039)	(2.814)	(5.024)
Adj. R-squared	0.581	0.144	0.686
Sample size	2110	2110	2110
Number of counties	215	215	215

Notes: A county is defined as small if a neighboring county is located within a 5 km radius (for counties in a large metro area) or a 10 km radius. Numbers in parentheses for the estimated coefficients are county-clustered standard errors. * is significant at the 10% level; ** is significant at the 5% level; and ***is significant at the 1% level.

this increase in employment were a result of absorbing demand from neighboring counties, the positive employment effect in a county with a large discount store would accompany a decrease in employment in the neighboring counties. Such a shift, if it occurs, is more likely to be observed in smaller counties that comprise a common market with one or more neighboring counties. In order to assess the extent to which the positive employment effect is driven by such a shift between counties that share a retail market, we examine whether the employment effect of the entry is affected by the size of county (e.g., small versus large). In particular, we add an interaction term to the small county indicator variable with the entry variable and examine the extent to which the coefficient of the entry varies from the baseline estimate. We classify a county as a small county if a neighboring county is located within a 5 km radius (for counties in a large metro area) or a 10 km radius.[23] The result in Table 10 suggests that the coefficient of the interaction term is not statistically significant. The magnitude of the coefficient on the Entry variable

[23] Based on the distance criteria, a county is classified as a small county if a neighboring county is within about a 20-min driving distance. The Commission of the European Communities defines the geographic scope of a market in terms of a 20-min driving time catchment area.

Table 11
Falsification tests of large discount store entry effects on manufacturing and services employment.

	(1) Standard model	(2) 3 major stores	(3) with 50,000 pop or more
Panel A. Manufacturing			
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	2110	2110	1701
Numbers of counties	215	215	185
Panel B. Business Services			
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	2110	2110	1701
Numbers of counties	215	215	185

Notes: Numbers in parentheses for the estimated coefficients are county-clustered standard errors.

decreases slightly for the Total Retail and Other Retail categories but the difference is not statistically significant. The results imply that the positive employment effect may not be driven by the shift of employment from neighboring counties.

While we find an increase in employment after the entry of a large discount store, that increase may occur as a sizeable number of part-time workers, hired by the large discount store, replace full-time workers in supermarkets or traditional retail stores. However, the result does not suggest that substitution between full-time and part-time workers is a potential issue.

The positive employment effect might be associated with a shift in employment from informal to formal retail sector. Although it is difficult to quantify such effect in the informal sector with a limited dataset, we suspect that there would have been a decrease in the informal retail activity. During the sample period, the decreased informal sector is not only observed in the retail trade sector, but is also evident for manufacturing and other services sectors, which implies that the positive employment effect might not be driven by a shift in employment from informal to formal retail sector.

In order to address the endogeneity issue, we conduct a falsification exercise of estimating the entry effect of large discount stores. To perform a falsification test, we estimate 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 general employment, our positive estimated effect might be spurious. Thus, we examine the effect of entry on manufacturing employment, which is correlated with general employment in the county but is not affected by the entry of a large discount store. In addition, we explore the effect on professional and business service industries (i.e., legal, accounting, building cleaning, and help supply services) to conduct the falsification test using service industries. We do not consider 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 11, we find no significant effect of the entry of large discount stores on manufacturing employment in the county. We repeat the analysis for counties with populations of more than 50,000 people. Although they are not statistically significant, the entry of large discount stores has a negative effect on manufacturing employment in the county. In panel B, we report the results for the business services sector. While the estimates are positive, none are statistically significant. These findings support the result 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 Korea led to an increase in retail employment in the counties. Approximately two thirds of this 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, which is a pattern similar to the US retail sector. However, we found that employment in small, specialized stores increased in the affected counties. The finding of a positive employment effect on small and medium-sized non-GMS suggests that there may exist a spillover effect, which is caused by the entry of a large discount store in a county or town.

The increase in employment in the retail sector may involve a more complicated reallocation process among different types of stores. During the structural change process in the retail sector, a number of workers in traditional mom-and-pop stores lost jobs as these stores were driven out. On the other hand, the number of workers in convenience stores and modern specialized stores has increased over time. The net growth in employment is an outcome of the modernization process in the retail sector,

triggered by the entry of large discount stores. In this respect, our finding of the positive spillover effect is different from a "retail agglomeration effect," which implies that the increase in employment reflects a relocation of the retail activity. The positive externalities created by the entry of large discount stores in Korea is not limited to draw customer traffic in a particular location, as discussed in Pashigian and Gould (1998) and Gould et al. (2005). Large discount stores have also attracted small, specialized shops by providing convenient, modern shopping amenities, such as easy indoor access with parking. As Lagakos (2013) emphasized the role of car ownership in adopting modern retail technology in a developing country, the increase in car ownership of middle classes in the 1990s, as well as a substantial income growth, helped expedite the expansion of large discount stores and subsequent growth in specialized stores. Thus, the positive spillover effect should be interpreted in terms of the modernization process, in which the increasing demand for modern shopping environments are getting fulfilled with the help of complementarity between large discount stores and specialized stores. We believe that more work focusing on changes in sales and productivity will shed light on the effect of large discount store on market expansion and efficiency improvement.

Finally, our finding on a positive employment growth effect might be associated with both legal settings and social norms in Korea. Deregulation in the Korean retail sector since the mid-1990s might have played a crucial role in the rapid diffusion of large discount stores, which triggered the modernization process in the retail sector and subsequently attracted many small modernized stores, such as franchised retailers. In addition to this institutional feature of the Korean retail sector, social norms might affect the modernization process. Rapid economic growth in the 1970s and 1980s increased income levels, which, in turn, increased the demand for modern shopping environments at the expense of shopping at traditional market districts. Identifying the roles played by these two factors would require further investigation using different datasets.

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, depending upon different development stages. However, with the exception of studies in the US, that focus mostly on the effect of Wal-Mart, relatively little academic research has been conducted on important changes in the retail industry. Our analysis of the Korean retail industry contributes to this growing literature by providing new evidence on the impact of the entry of large discount stores on the structural change in a developing country. The effect of such restructuring is limited not just to employment. Moreover, the spillover effect of the entry of big-box stores in developing countries may occur beyond the retail sector, such as in the agricultural and manufacturing sectors. For example, the diffusion of Wal-Mart in Mexico resulted in product upgrading by upstream manufacturers (Iacovone et al., 2011). Future studies on the effect of the entry of large discount stores on the modernization of the retail sector and its productivity growth will contribute to the ongoing evolution of the retail sector around the world.

Appendix

Table A and B

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 ($n = 215$)	
	Number of counties	Percentage of counties	Number of counties	Percentage 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

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