Do the Biggest Aisles Serve a Brighter Future?
Global Retail Chains and Their Implications for Romania

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Abstract

During the past two decades many countries have opened their retail sector to foreign direct investment, yet little is known about implications of such liberalization for the economies of host countries. Using firm-level data from Romania, this study examines how the presence of global retail chains affects firms in the supplying industries. The results suggest that the expansion of global retail chains leads to a significant increase in the total factor productivity in the supplying industries. Their presence in a region increases the total factor productivity of firms in the supplying industries by 3.8 to 4.7 percent, while doubling the number of chains leads to an increase of 3.3 to 3.7 percent. The expansion of global retail chains benefits larger firms more than small enterprises. The conclusions are robust to using the instrumental variable approach and are supported by the survey evidence. These results suggest that the opening of the retail sector to foreign direct investment may stimulate productivity growth in upstream manufacturing, and they provide another piece of evidence in favor of services liberalization.

1. Introduction

During the past two decades many countries, including some developing economies, have opened their retail sector to foreign direct investment (FDI). This liberalization has resulted in the emergence and rapid expansion of global retail chains. For instance, Wal-Mart, the world's largest retail chain and the largest company, has 2,913 outlets in 13 countries outside the United States, ten of which are in the developing world. French retailer Carrefour, the second largest retailer in the world and the largest in Europe, currently operates 8,688 outlets in 28 foreign countries, including 20 developing countries. In 1990, it was present in only two countries outside France. Despite the phenomenal growth of global retail chains, little is known about their potentially profound impact on the economies of host countries.

The entry of global retail chains may transform the retail sector and, more importantly, may affect the supplying industries in the host economy. Global retail chains differ from indigenous retailers not only in terms of scale but also in terms of their access to advanced technologies, modern management strategies and global sourcing networks. Their entry may change the landscape of the retail sector in the host country through increased concentration and modernization. Moreover, their expansion may have implications for supplying industries in terms of lowering distribution costs, stimulating economies of scale, and increasing competition due to a greater ability of foreign retailers to source products from abroad. The competition effect may in turn encourage productivity improvements and innovation among suppliers. Some of these effects have been documented in a recent case study describing the effects of Wal-Mart's entry on detergent producers in Mexico (Javorcik, Keller and Tybout 2008).

Despite the growing importance of global retail chains and the potentially large implications of FDI inflows into the retail sector, little effort has been devoted to understanding the channels through which the entry of global retailers may affect the economy of a host country.[1] This study takes a step towards filling the gap in the literature by examining the

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[1] The vast majority of studies on the impact of FDI on indigenous firms have focused on foreign presence in manufacturing industries with only a handful of studies considering FDI in services. Inter-industry effects of FDI inflows into the retail sector have not been systematically examined. The existing work on the retail sector and supermarket chains in the context of developing countries provides broader insight of the development in modern retailing. The existing studies, however, do not distinguish between foreign chains and domestic retailers and hence, do not clarify the potential impact of FDI inflows in the sector. Moreover, they focus only on the implications for agricultural producers. The literature focusing on the effects of expansion of indigenous retail chains in industrial countries is more advanced but examines mostly on the effects on other retailers and consumers. See the next section for a literature review.

implications of opening the Romanian retail sector to foreign direct investment.

We motivate our analysis with the results of a recent enterprise survey conducted by the World Bank in Romania. About 60 percent of the respondents reported that entry of foreign retail chains into their city has increased competition in the market through improving access to imports and stimulating emergence of new competitors. About 70 percent of firms *supplying* global retail chains reported increasing their market share, product diversity, frequency of product innovation and quality of packaging *after* they started doing business with global retailers. In contrast, only 13 percent of firms *not supplying* global retail chains reported an increase in their market share. The corresponding figures for increases in the product diversity, innovation and package were 31, 41 and 37 percent, much below the number reported by suppliers. The results of the survey also suggest that suppliers of global retailers exhibit superior performance in terms of total factor productivity (TFP) and labor productivity. Strikingly, no evidence of superior performance is observed one year before firms start doing business with global retailers.

To investigate the implications of entry of global retail chains in a rigorous manner, we employ panel data on retailers and manufacturing firms operating in Romania during the period 1997-2005. Our identification strategy relies on the differences in the timing of the entry of global retail chains into Romanian regions and the fact that only some industries within each region should be affected. We measure the regional presence of foreign chains using a dummy variable, the number of outlets or their selling space. We also employ the last two variables normalized by the size of the region. Using both OLS and an instrumental variable approach, we find that an expansion of global retail chains leads to a significant increase in the TFP in the supplying industries in the region where the expansion took place. The presence of global retail chains in a region increases the TFP of firms in the supplying industries by 3.8 to 4.7 percent and doubling the number of chains leads to a 3.3 to 3.7 percent increase. Larger manufacturers seem to be affected more than small enterprises.

We subject our results to a variety of robustness checks. We show that our findings are robust to using alternative measures of performance: labor productivity and the TFP measure taking into account the simultaneity bias between unobserved productivity shocks and input choices (estimated following Ackerberg, Caves and Frazer 2006). We demonstrate that our results hold when we exclude the region encompassing the capital city, control for regional wage

levels and take into account transport costs. We find that our conclusions are confirmed in specifications in first, second and long differences and that they are not subject to an autocorrelation problem.

The majority of restrictions on foreign direct investment today are not in manufacturing industries but in service sectors reflecting the reluctance of governments, especially in developing countries, to allow unrestricted foreign presence in what they believe are sectors of special importance. Our results suggest that opening of the retail sector to FDI may stimulate productivity growth in upstream manufacturing and provide another piece of evidence in favor of services liberalization.

This study is structured as follows. Section 2 reviews the related literature. Section 3 discusses the channels through which presence of global chains may affect supplying industries. Section 4 describes the data, while section 5 discusses the expansion of global retail chains in Romania. In section 6, we examine the link between the expansion of global retail chains and the performance of the supplying sectors in Romania. Section 7 concludes the paper.

2. Related Literature

Three strands of the literature are relevant to this study. The first one is research on how inflows of foreign direct investment into manufacturing affect a host economy. A large number of studies search for intra-industry effects, postulating that foreign entry may result in knowledge spillovers to local firms as well as in local producers losing part of their market share to foreign entrants. Empirical analyses based on firm-level panel data produce mixed results. While Aitken and Harrison (1999) find that an increase in FDI presence negatively affects the TFP of indigenous firms operating in the same industries, Aghion et al. (2004) and Haskel et al. (2007) reach the opposite conclusion.[2] More recent studies have argued that while foreign investors have an incentive to prevent knowledge leakage to their competitors, they may encourage transfer of information to their local suppliers. And indeed work by Javorcik (2004), Blalock and Gertler (2008) and Javorcik and Spatareanu (2010) shows a positive association between FDI and productivity in upstream industries (for a literature review see Görg and Greenaway 2004).

Compared with work on manufacturing industries, studies on the implications of FDI inflows in service sectors are relatively scarce. Eschenbach and Hoekman (2006) document a

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[2] For a review of the literature, see Görg and Strobl (2001).

positive relationship between progress in services liberalization, including openness to FDI, and economic growth in transition countries for the period of 1990-2004. Arnold et al. (2006) analyze firm-level panel data from the Czech Republic and find a significant positive effect of FDI in the services sectors on downstream manufacturing firms' TFP. Using industry-level panel data, Fernandes (2009) shows progress in service sector liberalization leads to an increase in labor productivity of downstream manufacturing in transition countries. The results of these studies suggest that the quality and availability of services inputs used by manufacturing industries may be positively affected by entry of foreign services providers. There is, however, no work documenting the possible implications of foreign entry into services in general (and retail sector in particular) for the performance of manufacturing firms in the supplying industries.[3]

The second literature relevant to this study consists of case studies on the evolution of the retail sector in developing and transition countries. A series of studies describe the rise of modern retail formats, contrast them with traditional retailers and examine the implications of this phenomenon for agricultural producers. Dries, Reardon and Swinnen (2004) draw a detailed picture of the evolution of supermarkets in Central and Eastern European (CEE) countries and discuss their implications for the agricultural sector. Swinnen et al. (2006) document how FDI in the retail sector in some CEE countries facilitates productivity growth of local dairy farmers. Reardon and Berdegue (2002) and Reardon, Timmer, and Berdegue (2003), Minten, Randrianarison and Swinnen (2006), Mattoo and Payton (2007) provide similar analysis on the rise of supermarket in Latin America, Asia and Africa and their effects on the agricultural sector. The majority of these case studies, however, do not distinguish between foreign supermarket chains and domestic ones and thus do not advance our understanding of the effects of FDI. Their focus is also limited to suppliers of agricultural products.

Several recent case studies are devoted to the implications of FDI inflows into retail sector. Chavez (2002) describes the evolution of foreign retail chains and Mexican domestic retailers around the formation of NAFTA and the increasing competitive pressure caused by the entry of foreign retailers. Javorcik, Keller, and Tybout (2008) document how the entry of Wal-Mart into Mexico facilitated the modernization of the retail sector and stimulated fundamental

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[3] Related work by Head, Jing and Swenson (2009) examines the effects of the presence of multinational retailers in Chinese regions on regional exports.

changes in the relationship between retailers and suppliers of soaps, detergents, and surfactants. They find that Wal-Mart's entry has driven high-cost suppliers out of business, benefited surviving producers by providing access to a larger market and prompted suppliers to introduce more innovations. In contrast, a case study by Durand (2007) concludes that FDI has played an important role in modernizing the retail sector in Mexico, but has dampened the performance of local retailers and retail wages by introducing higher competitive pressures. The large increase in imports initiated by Wal-Mart's entry has most likely negatively affected Mexican producers in the supplying sectors. These case studies suggest that there may be a strong relationship between the presence of global retail chains and the performance of supplying firms but the direction of such a relationship is still an open question.

The third strand of the related literature examines empirically the effects of expansion of indigenous retail chains on various aspects of economic activity in the retail sector in industrial countries. Basker (2005a) finds that Wal-Mart's entry into US regions has been associated with lower retail prices of various consumer goods. The magnitude of the effects varies by product and econometric specification, but generally ranges from 1.5–3 percent in the short run to four times as much in the long run. Jia (2008) develops an empirical model to assess the impact of chain stores on the profitability and entry/exit decisions of discount retailers. She finds that Wal-Mart's expansion from the late 1980s to the late 1990s explains about 40-50 percent of the net change in the number of small discount retailers and a similar percentage for all other discount stores. A study by Basker (2005b) estimating the effect of Wal-Mart's expansion on retail employment at the US county level produces mixed results. The literature is reviewed by Basker (2007).

3. Expansion of Global Retail Chains and Supplying Industries in the Host Country

The entry of global retail chains may affect the performance of firms in the supplying industries of the host economy through several channels. First, it may increase competitive pressures on suppliers. As retail chains become more important, their bargaining power vis a vis suppliers strengthens. Moreover, thanks to their extensive international sourcing networks, global retail chains often have the option of importing products rather than purchasing them locally. This stronger position (relative to other retailers operating in the host country) allows global

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retail chains to require suppliers to lower prices and/or improve their products. This in turn forces suppliers to become more efficient.[4]

Second, entry of global retail chains possessing cutting-edge retail technologies and familiar with the best international practices may help lower distribution costs faced by suppliers. Rather than sending their products to a large number of small retailers, suppliers may deliver larger shipments to several retail outlets. Thanks to computerized inventory systems used by global retail chains, suppliers may be better informed about changes in demand and may be better able to tailor their products to the expectations of consumers. Saving on employee time and usage of capital (e.g. truck fleet) when arranging distribution and planning production, suppliers may produce more output with the same amount of labor and capital and thus achieve a higher productivity level. Finally, global retail chains may stimulate economies of scale among suppliers by offering producers a larger market (both in the host country as well as abroad).

In sum, by increasing competitive pressures on suppliers, cutting distribution costs and offering easier access to information and a larger market global retail chains may stimulate productivity growth in the supplying industries.

Anecdotal evidence supports the view that entry of global retail chains has profound implications for the supplying sectors in the host country. For instance, Mexican-owned detergent producers have reported introducing incremental improvements to their products in order to avoid drastic price cuts demanded by Wal-Mart (Javorcik et al. 2008). Wal-Mart has also been reported to provide its suppliers with full and free access to real-time data on how their products are selling. Suppliers can plan production runs earlier and offer better prices (Economist 2001). Tesco, among others, tracks every purchase through its Club card and can use this information to help its suppliers to test and adapt innovations (The Boston Consulting Group 2007).

The results of a 2008 enterprise survey conducted in Romania by the World Bank paint a similar picture. Fifty-eight percent of enterprises indicate that entry of foreign retail chains into the respondent's city has increased the level of competition (see Figure 1a). The same percentage of respondents believe that competition from imports has increased because foreign retail chains sell a lot of imported products. Sixty-two percent indicate that entry of foreign retail chains has

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[4] Additionally, if the presence of global retail chains forces local retailers to lower their prices, they are likely to pass the price pressure onto their suppliers. Thus we would expect that entry of global retail chains will affect all producers in the supplying industries and not just firms supplying global retailers.

led to emergence of new competitors, and 42 percent indicate that it eliminated some competitors. As the impact of foreign retail chains is likely to vary depending on the sector of operation of a Romanian respondent, Figure 1b presents responses of firms that are likely to be affected the most, namely firms manufacturing food and beverage products (sector denoted by the NACE code 15). The percentage of firms reporting an increase in the level of competition is the same as for all sectors, though respondents appear to be affected more by emergence of new competitors than by competition from imports. In all cases, the vast majority of respondents reports that the effects are felt within two years after entry of foreign retail chains.

The survey results also suggest that Romanian suppliers of foreign retail chains are strongly affected by the appearance of foreign retailers. Figure 2a lists the self-reported changes in a firm's market share and product characteristics that took place after the surveyed firm started supplying one or more foreign retail chains. Figure 3a presents the reported impact of entry of foreign retail chains into the respondent's city on the companies that do not supply foreign retail chains. The difference between the patterns presented in the two figures is striking. While 71 percent of suppliers report an increase in their market share, 73 percent of non-suppliers report no change. Similarly, while 71-72 percent of suppliers report increasing the diversity of their products, an increase in the frequency of product innovation and an improvement in the quality of packaging, the corresponding figures for non-suppliers are 31, 41 and 37 percent, respectively. When the sample of respondents is restricted to just firms manufacturing food and beverages (NACE 15), a similar pattern is observed (see Figures 2b and 3b).

Finally, when we combine the information on the surveyed firms with their balance sheet data from Amadeus data base, we find that suppliers of global supermarkets exhibit superior performance relative to other firms in their industries. This is true when their performance is measured using labor productivity or TFP defined in two different ways. Depending on the performance measure used, the supplier premium ranges from 13 to 32 percent and is statistically significant in all cases. Interestingly, the supplier premium is not present in the year prior to the firm starting to supply a global retain chain (see Appendix I for details). Although we think of these estimates as capturing summary statistics, rather that pinning down a causal effect, we find them to be suggestive of productivity improvements taking place during the time firms supply global retail chains. We believe that they provide a good motivation for our core analysis.

4. Data

Our study examines the link between the expansion of global retail chains and developments in the supplying industries in the context of Romania. Focusing on Romania has three advantages. The first advantage is the availability of high quality and comprehensive firm-level data. We have time-varying information 513,554 companies operating in Romania during the period 1997-2005, of which 64,767 belong to manufacturing industries. The data set contains information on firms of all sizes, including those with one employee. As small or medium-sized enterprises in the supplying industries may be affected to a different degree than large companies, being able to include them in the analysis is an advantage. The second advantage is the timing of the entry of global retailer chains. They started entering Romania only in the mid-1990s which means that our data cover both the pre- and the post-entry period. The third advantage is that Romania is a large country. With a population of 22 million and an area about 238,000 km^2, it encompasses 42 county-level administrative units and eight broader NUTS regions.[5] Thus, in our econometric analysis, we are able to rely not only on inter-temporal but also on cross-regional variation in the presence of foreign chains.

The main data source for the study is the commercial data base Amadeus published by Bureau van Dijk. It contains information on about 9 million public and private companies in 38 European countries for the 1996-2005 period. Amadeus includes data on location, contact information, industry classification, standard financial statements and detailed shareholder information including the country of origin.

To identify global retail chains, we use information on company name, industry classification and ownership from Amadeus, which we cross check against the information on major international retail chains in the *World Retail Data and Statistics 2006/2007* and *European Marketing Data and Statistics* published by the Euromonitor International, Economist Intelligence Unit (EIU) Industry Briefing *Romania: Consumer Goods and Retail Background*, the *GAIN Report* by USDA Foreign Agriculture Service and *Dun & Bradstreet Business Report*. We identify 9 global retail chains operating in Romania. Their names and characteristics are listed in Table 1.

Amadeus data base provides aggregate figures on company operations in Romania. More detailed data on the presence of global retail chains in different Romanian regions were obtained

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[5] NUTS stands for the EU nomenclature of territorial units for statistics defined by Eurostat.

by contacting each retail chain directly. We were successful at collecting information on the opening date of all stores, their location and selling space for 7 of the 9 chains operating in Romania. We did not manage to obtain the data for Kaufland, which entered Romania during the last year of the sample, and Mega Image which is one of the smaller entrants.

In the sample of manufacturing firms, we start with 320,373 observations on 64,767 companies which report the basic information including the value of total assets, turnover and employment. We drop observations with negative values of total assets and fill in missing values for output and input variables by interpolation. The resulting sample consists of 299,236 observations on 55,673 firms, or 93 percent of original sample. Next, we exclude observations with unusually large fluctuations in output and input variables, which leaves us with 256,679 observations on 53,402 firms. We also drop observations for which the firm's age (a covariate in our model) is missing. This leaves us with 250,950 observations on 52,138 firms, which is the sample used to analyze the impact on labor productivity. When we focus on the TFP as the outcome of interest, we drop observations with unusual fluctuations in the TFP measures. We end up with 221,236 observations on 49,552 companies or 245,568 observations on 51,929 companies depending on the TFP measure used.

We deflate output by the producer price index (PPI) for the three-digit NACE sector, obtained from the *Statistical Yearbook of Romania*. We measure labor input as the number of employees, and capital as deflated tangible fixed assets. The capital deflator is a simple average of PPI from five NACE sectors.[6] We define material inputs as material costs deflated by the weighted average of PPI of the supplying sectors with the weights given by 2000 input-output matrix provided by the Statistical Institute of Romania. Real wage is deflated by the consumer price index from the IMF's *International Financial Statistics* (IFS).

In one of our robustness checks, we also include the average real wage per worker at the regional level. To calculate the average real wage, we use data on wages and employment of all companies operating in Romania during the period of 1997-2005 listed in Amadeus data base, including all firms active in agriculture, industry, and services sectors. The data are then deflated by the consumer price index. In another specification, we also utilize information on the regional gross value added reported in the Eurostat database of regional statistics.

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[6] These are: machinery and equipment; office, accounting, and computing machinery; electrical machinery and apparatus; motor vehicles, trailers, and semi-trailers; and other transport equipment.

Finally, we also use information on imports and exports obtained from the UN's COMTRADE data base. We convert the data into Romanian lei using the average annual exchange rate from the IMF's IFS and deflate the figure by the GDP deflator from the IFS.

5. Expansion of Global Retail Chains in Romania

As the focus of this study is the relationship between the presence of global retail chains and the performance of the supplying industries, we first turn to developments in the Romanian retail sector. Relative to other services, retail and wholesale sector accounts for a large portion of Romania's economic activity. In both 1997-2000 and 2001-2004 periods, it contributed about 10 percent to total employment and value added of the economy (Fernandes 2009). It was the largest service sector in terms of employment.

Compared to other Central and Eastern European countries, the retail sector in Romania was a late bloomer in terms of FDI inflows. The first entry of foreign retail chains into the Czech Republic, Hungary, and Poland took place in the early 1990s, and a broader expansion of these chains occurred around the mid-1990s. The first entry of global retail chains into Romania, however, did not take place until 1997 when the German chain Metro opened its first Metro Cash & Carry outlet in Bucharest. It took another two years before other large European retailers entered Romania. Only since year 2000, Romania has seen rapid expansion of foreign retailers, including Carrefour from France, REWE from Germany, and Cora from Belgium (see Table 1). In 1999, there were only 5 outlets of 2 global retail chains operating in Romania. From 1999 to 2001, the number of outlets increased fivefold. From 2001 to 2005, the number again tripled and reached a total of 86 outlets. The total selling space of global retail chains increased 10 times from 43,000 square meters in 1999 to 463,000 square meters in 2005 (see Table 2).

Following the trend observed in other transition economies, foreign chains have become dominant players in the Romanian retail sector, in which there are few significant domestic players. In 1999, they employed around 1,400 workers, invested 44 million dollars in capital stock and generated 5.5 percent of total retail sales. In 2005, they had a total workforce of more than 18,900, a total capital stock of 844 million dollars and generated 3.27 billion dollars in sales, accounting for about 22.2 percent in total retail sales.

The expansion of global retail chains in Romania was not uniform across regions. The area around the capital city Bucharest, especially its outskirts, was the initial focus of their entry.

The Western region, close to Hungary, also attracted a lot of entry in the initial period (see Table 3). In 2005, the regional distribution of outlets was still uneven. There were 16 and 19 outlets in Bucharest and West, respectively, but only 4 outlets in Northeast and 3 in Southwest (see Figure 4).

Global retail chains differ from other retailers operating in Romania. They are much larger in terms of employment, capital stock and sales. They are more capital intensive (as measured by capital-labor ratio). This is consistent with the anecdotal evidence suggesting that global retail chains tend to be leaders in adopting advanced retail technologies, from large sales rooms and warehouses to computerized inventory tracking systems. In terms of sales per worker, real wage per worker, and value added per worker, global retail chains exhibit a premium in terms of all three variables. Moreover, global retail chains enjoy larger market shares. However, there does not appear to be any differences in terms of profitability measured by return on assets and return on sales.[7]

To summarize, although their entry into Romania lagged behind their expansion in other more advanced transition countries in CEE, global retail chains expanded rapidly in Romania since 2000. Their expansion was uneven across regions with Bucharest area receiving the first and the most entries. Overall, global retail chains have played an increasingly important role in the sector and accounted for over one fifth of the total retail sales in 2005. Their rapid expansion and larger size (relative to domestic competitors) suggest that they may have greater bargaining power vis a vis suppliers while at the same time offering them access to a larger market and lower costs. In short, the presence of global retail chains has most likely brought significant changes to the landscape of the retail sector in Romania. In the next section, we explore the implications of their presence on the performance of the supplying industries, which is the main objective of this study.

6. Impact on the Total Factor Productivity in the Supplying Industries

6.1 Identifying Assumptions

In our analysis of the relationship between the presence of global retail chains and the performance of the supplying industries, we take advantage of regional variation in foreign chains' expansion. We rely on the Nomenclature of Territorial Units for Statistics (NUTS) and

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[7] For details of this analysis see the earlier version of this study (Javorcik and Li 2008).

divide Romania into eight NUTS regions with an average territory of 29,800 square kilometers. We focus on the changes in the performance of the supplying sectors following the entry of foreign chains into their region. Our identifying assumption is that the impact of global chains' entry should be felt most strongly within the region of entry.

We base our assumption on the following facts. First, while Romania is the third largest country in CEE with a territory of 238,000 km^2, its rail and road networks are among the least extensive in transition countries hindering development of national distribution systems (*World Development Indicators*). Second, the distribution system in Romania is underdeveloped as very few professional distributors are in operation. Foreign retailers find it difficult to find distributors with the required skills and capital base (EIU 2004, 2006). Third, one of the global retailers confirmed that the company does not use a centralized procurement system in Romania and that each outlet independently sources goods for sale. This suggests that individual stores are more likely to source locally than nationally. Fourth, producers located close to outlets of global retail chains may be better informed about the type of products sold by the chains, their characteristics and pricing, and thus more likely to supply the chains.

Our second identifying assumption is that entry of a global retail chain into the region should affect some manufacturing sectors but not others. More specifically, we believe that sectors supplying consumer products to supermarkets, as opposed to sectors supplying industrial inputs, should be affected. As food products are the most popular goods sold in all formats of supermarkets, we narrowly define supplying sectors as food manufacturing industries and focus on the impact of global retail chains' expansion on these sectors. We identify food supplying sectors based on products listed on the web pages of retailers operating in Romania and match them with 3-digit industry codes in the NACE classification. Our list of the supplying sectors includes: production, processing and preserving of meat and meat products; processing and preserving of fruit and vegetables; manufacture of dairy products; manufacture of grain mill products, starches and starch products; manufacture of other food products; manufacture of beverages. According to the Romanian input-output matrix for year 2000, 31 percent of all purchases of the retail and wholesale sector originated in these industries.[8]

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[8] We are aware of the fact that some sectors producing non-food consumer products may also be affected by entry of some (though not all) global retail chains. An earlier version of this study focused on sectors manufacturing fast moving consumer goods (rather than just food) and produced qualitatively similar results. However, as we have no way of identifying non-food products sold by each chain, we choose to focus on manufactured food products. This

For the regional analysis to be meaningful, we would like to make sure that the affected sectors are represented in all regions of the country. This is indeed the case. All sectors are spread across all eight NUTS regions. In particular, manufacturing of fruit and vegetable products is represented in 37 counties in 1998 and 40 counties in 2004; manufacturing of diary products existed in 41 counties; and the remaining four sectors are spread across all 42 counties.

Our identification strategy should work best for goods that are expensive to transport. We will examine this question in our robustness checks and show that this is indeed the case. This robustness check will constitute another piece of evidence supporting our identification strategy based on regional variation in global chains' presence.

Ideally, we would like to base our analysis on plant- rather than firm-level data. Unfortunately, plant-level information is not available to us. In the case of firms that own plants in multiple regions, the presence of global retailers will be measured with error which is likely to bias our estimates toward zero, making it more difficult to find a statistically significant effect. Thus our estimates should be thought of as a lower bound on the true effect.

Finally, as we recognize that regional characteristics can potentially affect the entry decision of global retail chains, we will also use instrumental variable approach in our analysis.

6.2 Descriptive Analysis

As the first step in our analysis, we consider some descriptive statistics. We estimate the distributions of the logarithm of TFP for firms operating before and after the entry of global retail chains. We do so separately for food supplying sectors and for the remaining industries.[9] These distributions are plotted in Figure 5. We note that the distribution of productivity shifts to the right in the post-entry period in the case of food supplying sectors. The pattern for non-food supplying sectors is less clear.

The difference becomes more pronounced at the regional level. We calculate the average level of the logarithm of TFP for firms operating in a given region in a given time period. For both food supplying and non-food supplying sectors, we compare the distribution in the period

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means that our results will *underestimate* the overall effect of global retail chains on manufacturing. As in our regressions we examine how the presence of global retailers affects the performance of food sectors (relative to the performance of all manufacturers), not taking into account the possibility that non-food manufacturers are also affected by global chains will *work against us* finding a statistically significant effect.

[9] As explained in detail in the next section, TFP is measured relative to a hypothetical firm operating in the same sector in the first year of the sample 1997.

before and after the entry of global retail chains. As shown in Figure 6, there is a clear shift of the distribution of productivity to the right in the post-entry period in the case of food supplying sectors. The pattern for non-food supplying sectors is not clear. While we cannot say anything about the direction of causality, these charts hint at a positive relationship between the productivity of the supplying industries and the presence of global retail chains.

As the pattern observed in Figure 5 and Figure 6 could be capturing effects of macroeconomic shocks or regional trends, we proceed to examine the relationship between the expansion of global retail chains and the TFP in the food supplying industries using a regression analysis.

6.3 Empirical Strategy

In our empirical analysis, we compare the TFP in the supplying industries before and after the entry of foreign chains into their region with the TFP of non-supplying industries in the same region during the same period. We conduct our analysis based on the following specification:

$$\ln TFP_{it} = \gamma_0 + \gamma_1 Food_s \times global\_chain_{r,t-1} + \gamma_2 \ln age_{it} + V_{s,t-1}\Gamma + \gamma_{rt} + \nu_i + \mu_{it} \quad (1)$$

where $\ln TFP_{it}$ denotes the logarithm of the total factor productivity of manufacturing firm i's operating in sector s at time t. Our baseline measures of TFP is a multilateral index calculated following Aw, Chen and Roberts (2001). We first express individual firm's outputs and inputs (capital, labor and materials) as deviations from a hypothetical reference firm operating in the same sector at time t with average input costs shares, average logarithm of inputs and average logarithm of outputs. Then we chain-link all reference firms together over time within a sector. This productivity index is an extension to the multilateral TFP index derived by Caves et al. (1982), and it allows for consistent comparison of TFP of firm data with panel structure (see Appendix II for a detailed formula). Thus the index is a measure of the proportional difference in TFP for firm i observed in year t relative to the hypothetical firm in the base year, 1997. The index is calculated separately for each of the 3-digit NACE manufacturing sectors.

As a robustness check, we also employ two alternative measures of firm performance. The first measure is the TFP estimated following Ackerberg, Caves and Frazer (2006) who build on the earlier work of Olley and Pakes (1996) and Levinsohn and Petrin (2003). This measure allows us to take into account the possibility that a firm's private knowledge of its productivity

(unobserved by the econometrician) may affect the input decisions.[10] The second measure is the labor productivity, defined as the value added per worker. All three measures lead to qualitatively the same conclusions. We choose the TFP index as our baseline measure as it allows for flexible and heterogeneous production technology within sectors.[11]

The explanatory variable of interest is the interaction term between the dummy for food supplying industries, denoted as $Food_s$, and a measure of regional presence of global retail chains, denoted as $global\_chain_{r,\,t-1}$. As explained above, we narrowly define the supplying industries as sectors manufacturing food products.

To take advantage of regional variation in their entry, we quantify the presence of global chains in seven different ways. Our first measure is a dummy taking on the value of 1 if at least one global retail chain is present in the region r at time t, and zero otherwise. As our second measure, we use the number of global retail chain outlets in the region r at time t in logarithmic form, adding one before taking a log. The third measure is the logarithm of the chains' total selling space in the region at time t (again one is added before taking a log). The next two proxies are designed to measure the presence of foreign chains relative to the size of the food manufacturing sector. They are defined as the number of outlets or the total selling space divided by the total output of food manufacturers operating in a given region in a given time period. The final two measures express the presence of foreign chains relative to the economic size of the region. Thus the number of outlets or the total selling space are normalized by the gross value added of the region at time t. We lag the measures by one period to take into account the time lag needed for the effect to manifest itself and to attenuate potential endogeneity problems.

We also control for other factors that may affect the performance of manufacturing firms. We use the number of years since establishment of a manufacturer to control for learning-by-doing effects. The variable is denoted as age_{it} and enters in a logarithmic form. We control for the effects of trade liberalization by including sector-level imports and exports. Both variables are lagged one period and take the logarithmic form. The level of competition in the industry is another potential factor influencing firm productivity, and we use the Herfindahl index to take it into account. Summary statistics for all variables are listed in Table 4.

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[10] We are grateful to Carolina Villegas-Sanchez for sharing with us a STATA routine implementing the procedure proposed by Ackerberg et al. (2006).

[11] A comparison of the robustness of five widely used productivity measures (index numbers, data envelopment analysis, stochastic frontiers, GMM and semiparametric estimation) suggests that the approach we chose tends to produce very robust results across the different experiments (see van Biesebroeck 2007).

To take into account the uneven economic development across Romanian regions, we control for time-varying regional factors by including a set of region-year fixed effects. We also include firm fixed effects to take into account unobservable firm characteristics, such as managerial ability. These fixed effects will also allow us control for time-invariant sector characteristics, for instance, level of the sector development in the pre-transition period and extent of privatization during the early reform period.

Finally, we correct the standard errors to take into account the fact that the measures of global retail chains' presence are at the region-year level while the dependent variable is at the firm-year level. Failure to correct for such data structure may lead to a downward bias in the estimated errors. We perform the correction by clustering standard errors at the region-year level.

6.4 Baseline Results

In our baseline results, reported in Table 5, the firm performance is measured using the multilateral TFP index. We present the estimates for each of the seven measures of global chain presence separately and report results of specifications without time-variant sector-specific variables together with the full model. Note that we do not need to include the variable $global\_chain_{r,t-1}$ by itself in the model as productivity changes coinciding with the chain's entry and affecting all manufacturing sectors equally are captured by region-year fixed effects.

We find that expansion of global retail chain leads to a significant increase in the total factor productivity of the food supplying sectors. This effect is statistically significant at the 1 percent level across all specifications. The presence of foreign chains increases the TFP of firms in the food supplying sectors located in the region by 3.8 to 4.7 percent (based on the results from column 1 and 2). The results from column 3 and 4 indicate that doubling the number of chains will lead to a 3.3 to 3.7 percent increase in firm productivity among food suppliers. If we take as a benchmark the average regional growth rate of the number of foreign chains' outlets (50 percent), the model predicts that the TFP of food suppliers increases by 1.65 to 1.85 percent per year in a region where foreign chains expand at the average speed. The results in column 5 and 6 suggest that doubling the selling space increases the TFP of food supplying sectors by about 0.4 to 0.5 percent. As illustrated in the remaining four columns, the results are robust to normalizing the measures of chain presence by either the value of output in the region's food sector or the region's gross value added.

The productivity effects in Table 5 are comparable in magnitude to those found by studies examining spillover effects of FDI. For instance, Haskel et al. (2007) report that doubling the share of foreign employment in a UK industry increases the firm TFP in the same industry by about 5 percent. Using Lithuanian data, Javorcik (2004) finds that doubling the foreign presence in downstream sectors is associated with a 3.8 percent rise in the TFP of domestic firms in the supplying industry.

As for the control variables, the coefficient on firm age is positive and significant across all specifications, which is consistent with learning-by-doing effects. The Herfindahl index bears a negative and statistically significant coefficient. It suggests that higher concentration is correlated with a lower productivity, which is in line with the belief that more competition encourages better performance. Imports are negatively correlated with firm productivity and exports do not appear to matter. The results on imports differ from the conclusions of Pavcnik (2002) for Chile and Fernandes (2007) for Colombia, but are in line with the findings of Arnold et al. (2006) for the Czech Republic.

6.5 Alternative Measures of Performance

We subject our results to a series robustness checks. First, we employ an alternative measure of the TFP, suggested by Ackerberg et al. (2006), which corrects for the simultaneity bias between productivity shocks and input choices. This alternative TFP measure is highly correlated with the TFP index used in the baseline results (correlation of 0.72). As before, we find that the entry of global retail chain leads to a significant increase in the TFP of the food supplying sectors (see the top panel of Table 6). The estimated coefficients are statistically significant at the 1 percent level in all specifications. They are also larger in magnitude than those found in Table 5. Doubling the number of foreign chains' outlets in the region increases the TFP of the food supplying sectors in the region by 5.5 to 6 percent.

Second, we focus on the labor productivity as the outcome variable (see the bottom panel of Table 6). As the labor productivity is strongly affected by the capital intensity of the production process, we control for the log of the firm's capital-labor ratio. Using this alternatively measure of firm performance reinforces our earlier findings. We find a positive link between the expansion of foreign retail chains and the performance of food producers in the region. The estimated coefficients are significant at the one percent level in all specifications. As

expected, we also find that capital intensity is positively correlated with labor productivity.

As all three measures of firm performance lead to the same conclusions, in what follows we only report the results for the TFP index. However, using the alternative measures would not change the conclusions of the study. To save space, we will also restrict our attention to the first three measures of foreign chain presence.

6.6 Robustness Checks

Next, we consider possible outlier issues. Bucharest as the capital of Romania has disproportionate concentration of economic activity and wealth. It produces about 20 percent of the country's GDP while only accounting for 10 percent of the total population. To check whether our results are affected by the special case of Bucharest, we exclude observations from Bucharest and perform the baseline analysis. As evident from the top panel of Table 7, all coefficients on the presence of global chains remain positive and significant at the 1 percent level. The magnitudes are very similar to those found in Table 5. Thus these estimates indicate that our findings are not driven by the observations from Bucharest.

Further, one may be concerned about a potential omitted variable bias. It could be the case that an increase in the regional income stimulates regional demand for food sectors more than that for other industries and that a higher demand encourages food production and at the same time attracts global retail chains to the region. To examine our results against this alternative explanation, we compute the average real wage in the region and use it as a proxy for the regional income level. We add the interactive term between *Food* and the log of the average wage in the region to our model. The results, reported in the second panel of Table 7, show that our findings are robust to this modification. The additional interaction terms does not appear to be statistically significant in any of the models and bears a negative sign. This pattern suggests that the relationship between regional income level and productivity does not exhibit systematic differences across food and non-food sectors (note that the effect of regional wages on *all* industries is captured by region-year fixed effects). Our variable of interest, the interactive term between *Food* and the global chain presence, remains positive and statistically significant in all of the specifications. It suggests that the regional expansion of global retail chains facilitates productivity growth of food supplying sectors located in the same region.

If our identification strategy based on the regional variation is reasonable, we would

expect to observe that goods that are more expensive to transport should be more affected by the entry of global retail chains into the region, as they are more dependent on the regional retail infrastructure than other products. To check whether this is true we use the data on the product-specific transport from Javorcik and Narciso (2008).[12] Each of 28 4-digit NACE sectors producing food is classified as facing high transport costs if its costs are above the median value found for food sectors. We augment our baseline specification by adding an interaction terms between the dummy for high transport cost food sectors and the presence of local chains. If food industries facing high transport costs are affected more by the entry of global retailers than the food sectors in general, then this additional interaction term will be positive and statistically significant. This is indeed the case in all specifications (see the third panel of Table 7). The interaction term between *Food* and the presence of foreign chains in the region remains positive and statistically significant in all models. We conclude that these results give credibility to our identification strategy and confirm our findings on the link between the activities of foreign retail chains and the firm performance in the supplying industries.

To make sure that our results are not driven by mismeasurement of capital stock driven by differences in valuation of capital between old and new firms, we check whether young food producers (defined as firms in the first three years of their operation) are affected differently. As evident from the bottom panel of Table 7, this does not appear to be the case. The additional interaction term is statistically significant only in 2 of 6 specifications, and the variable of interest is not affected by this modification.

As pointed out by Klette and Griliches (1996) and Katayama, Lu, and Tybout (2006), there are several difficulties involved in using TFP to capture productivity improvements. Substitution of the data on sales revenues, depreciated capital spending and real input expenditure for information on the physical quantities of output, capital and intermediate inputs may lead to confounding higher productivity with higher markups.[13] In our case, this is less of a

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[12] The figures are derived from the difference between the value of Finnish imports from Germany recorded including the cost of insurance and freight (c.i.f. basis) and the value of German exports to Finland recorded in Germany net of the cost of insurance and freight (f.o.b. basis). Finland was chosen by Javorcik and Narciso (2008) as the importing country because it was ranked by Transparency International as the least corrupt country in the world, which suggests that Finnish import data are unlikely to be contaminated by tariff evasion. Annual figures are available in 6-digit HS classification for 1992-2005. We compute the average value for each HS code and then concord the HS classification with 4-digit NACE codes.

[13] Though Mairesse and Jaumandreu (2005) find that estimating the revenue function (using a nominal output measure) or the production function proper (using a real output measure) makes very little difference for the results in their sample.

concern as global retail chains are likely to press suppliers to lower their markups (recall the survey results indicating an increase in competitive pressures).

Nevertheless, as Katayama et al. (2006) argue that the problems with using TFP are reduced in difference specifications, we check whether our results are robust to differencing. In the specification in first and second differences, we drop firm age but still include region-year fixed effects. We also cluster standard errors at the region-year level. We present the results in Table 8. The interactive term between *Food* and each of the three measures of the regional presence of global chains remains positive and statistically significant in all specifications. The magnitude of the impact is smaller than in the baseline specification when the presence of foreign chains is measured as a dummy or in terms of their selling space. When we use the number of outlets to proxy for foreign chains' regional presence, the magnitudes are similar to the baseline results. In summary, our conclusions remain robust.

We also conduct a simple cross-sectional regression on the overall changes in TFP between 1997 and 2005. The measures of regional presence of global retail chains and sector-specific variables are lagged by one period and span 1996 to 2004. Correspondingly, we only include region fixed effects and cluster the standard errors at the region level. The results are presented in the bottom panel of Table 8. The overall changes in the TFP of the food supplying sectors during the period are shown to be positively correlated with changes in the regional presence of global chains. The estimated coefficients are statistically significant at the 1 percent level in all specification.

Finally, we examine whether our results are not subject to autocorrelation problem when using dummy for the presence of foreign chains. Bertrand et al. (2004) show that estimations with a difference-in-difference method using panel data are likely to be subject to serial correlation problems and the standard errors could be severely underestimated. To check for this potential estimation bias, we take their advice and ignore the time-series information when computing standard errors. We perform the test in three steps. First, we regress the logarithm of TFP on control variables (other than the variable of interest) and fixed effects and keep the residuals for food supplying sectors. Second, we divide the residuals into two groups: residuals from the years before foreign chains' entry and residuals from post-entry period and calculate a within-firm average for each period. Finally, we regress the two-period panel of mean residuals on the dummy denoting the presence of global retail chains. We also repeat the procedure for a

one-period lag of the of the foreign chains' presence. As evident from Table 9, in both specification the dummy remains positive and significant at the 1 percent level though its magnitude becomes smaller. Given these findings, we feel reasonably confident that our baseline results are not subject to the autocorrelation problem.

6.7 Potential Endogeneity Problem

To address a potential endogeneity problem, we check whether there is evidence of an impact *before* the actual entry of global chains takes place in the region. As economic conditions vary across regions, global retail chains may choose to operate in regions where food supplying sectors are highly productive in the first place. If such reverse causality exists, food suppliers in regions that attract global chains should exhibit higher TFP before the entry of global chains. To capture firm performance in the pre-entry period, we define a new variable which takes the value of one in the year *prior* to the entry of global chains into the region, and zero otherwise. We include an interactive term between *FOOD* and this new dummy in our estimation. We report the results in Table 10. The new interactive term does not appear to matter, while the interactive term between FOOD and global chain presence remains positive and statistically significant. We conduct t-tests and find that the magnitudes of the coefficients on these two variables are significantly different from each other. These findings suggest that global retail chains are not attracted to regions with more productive food producers and thus give us confidence that reverse causality is unlikely to be a serious problem in our analysis.

Furthermore, we employ an instrumental variable approach to take care of potential reverse causality and omitted variable bias. We instrument for the interaction between *Food* and global chain presence by taking into account the following factors. First, the expansion of global retail chains in Romania may be part of their business strategy for the whole Central and Eastern Europe. For instance, Dries et al. (2004) find that global retail chains tend to adopt "anchor" strategy in CEE by establishing their business first in relatively advanced countries, including the Czech Republic, Hungary and Poland, which the authors classify as "first wave countries", and then moving into nearby economies. Alternatively, the chains may face capacity limits when considering expanding into the CEE and thus may choose to enter only a subset of countries. Finally, the initial development in supplying industries may affect foreign retailers' entry decision into specific region. Based on all these factors, we use the following four instruments:

$sale\_share_{sr} * \ln(global\_chain\_in\_1stWave\_\&\_Romania)_{t-1}$

$sale\_share_{sr} * \ln(global\_chain\_in\_1stWave\_only)_{t-1}$

$sale\_share_{sr} * \ln(global\_chain\_in\_2ndWave\_\&\_Romania)_{t-1}$

$sale\_share_{sr} * \ln(global\_chain\_in\_2ndWave\_only)_{t-1}$

The first part of each instrument, *sale_share_{sr}*, denotes the sector share in the total regional manufacturing sales in 1996, which is prior to the first year of our sample. It captures the initial condition (importance) of each sector in the region. The second part of each instrument captures annual sales by global retail chains in two groups of CEE countries (the first wave countries and the rest) by two types of global retail chains: those operating in Romania and those not doing so. Thus *global_chain_1stWave_&_Romania* is defined as the annual sales in the first wave countries by chains having outlets in Romania, and *global_chain_1stWave_only* is defined as the annual sales in the first wave countries by chains without outlets in Romania. Similarly, *global_chain_2ndWave_&_Romania* captures the annual sales in the second wave countries by chains having outlets in Romania. Note that the chains' sales in Romania are excluded. We identify global retain chains based on sources described in section 4 and obtain the information on their sales in other CEE countries from Amadeus data base. The figures enter in the log form and are lagged one period. The interaction of these two components creates sector-region-year specific instrumental variables that are consistent with the dimensions of our potentially endogenous variables.

The results from the instrumental variable approach, presented in Table 11, are consistent with our baseline results. They suggest that the regional expansion of global retail chains leads to a significant increase in the TFP of the supplying industries. The interactive term between *FOOD* and presence of global chains remains positive and statistically significant across all models. The magnitude is, however, only about half of that found in the baseline results. The Shea's partial R^2 indicates that our instruments are reasonable predictors of the potentially endogenous variable. Almost all instruments bear statistically significant coefficients. The estimates hint at the presence of capacity constraints. When the operations of chains active in Romania are considered, the results suggest a negative correlation between the extent of their presence in Romania and their sales in the first wave CEE countries. The same is true for their sales in the second wave CEE countries. At the same time, the estimates suggest that expansion of retail chains in Romania is positively correlated with the general trends in the first wave CEE countries (as

reflected by the positive coefficient on the sales of chains not present in Romania in the first wave countries). The Sargan test does not cast doubt on the validity of the instruments.

6.8 Extensions

As an extension we conduct the baseline analysis separately for manufacturing firms of different sizes. The results are reported in Table 12. We find that the positive correlation between global chains' presence and the TFP of firms in the food supplying industries is verified across firm sizes, as the interactive term remains positive and significant at the 1 percent level. The estimated coefficient becomes smaller as the size of firms considered falls. This finding implies that the presence of global chains benefits large food suppliers the most and has a smaller impact on smaller firms. For suppliers with more than 25 employees, presence of foreign chains can on average lead to 8 percent increase in their TFP while for firms employing fewer than 5 people the chains' presence would only lead to a 2 percent increase in their TFP. Similarly, a doubling the number of chain outlets will lead to a 6.1 percent increase in TFP among suppliers with more than 25 employees but only a 2 percent increase among firms with fewer than 5 people. In our data, half of the firms are smaller than 5 employees and only less than a quarter of firms have more than 25 workers.

These results are intuitive in that as large retail chains tend to source large volumes they are more likely to work with larger suppliers. Thus it is not surprising that larger manufacturers are the major suppliers to global chains and hence, benefit most from their expansion. Small firms produce less for foreign chains, because they do not have the technology and financial support to meet the quality or quantity requirements set by the chains. Note, however, that it may be in the interest of retail chains to keep some small suppliers as a way of increasing price pressure on the larger producers (see the example of Wal-Mart in Mexico in Javorcik et al. 2008).

7. Conclusions

This study uses Romanian firm-level data to examine the link between the entry of global retail chains and developments in the supplying sectors. The econometric results lead us to the following conclusions. The expansion of global retail chains leads to a significant increase in the total factor productivity in the supplying industries. The chains' presence in a region increases TFP of firms in the supplying industries by 3.8 to 4.7 percent and doubling the number of chains

leads to a 3.3 to 3.7 percent increase. The presence of global chains benefits larger firms the most and has a smaller impact on small enterprises. The conclusion on the positive impact of the presence of global retail chains on the supplying industries is robust to several extensions and specifications, including the instrumental variable approach.

The results indicate that opening of the retail sector to FDI may stimulate faster productivity growth in upstream manufacturing in the context of transition and developing economies. It extend our understanding of FDI in service sectors. It also suggests that countries prohibiting FDI inflows into the retail sector may be foregoing an opportunity to provide a competitive stimulus to the upstream industries.

References

Ackerberg, Daniel, Kevin Caves, and Garth Frazer (2006). Structural Identification of Production Functions. Mimeo, UCLA

Aghion, Philippe, Richard Blundell, Rachel Griffith, Peter Howitt and Susanne Prantl (2004). Entry and Productivity Growth: Evidence from Microlevel Panel Data. *Journal of the European Economic Association* 2(2–3): 265–276

Aitken, Brian and Ann Harrison (1999). Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela. *American Economic Review* 89(3): 605-618

Arnold, Jens, Beata S. Javorcik and Aaditya Mattoo (2006). Does Service Benefit Manufacturing Firms? Evidence from the Czech Republic. World Bank Policy Research Working Paper 4109

Aw, Yan Bee, Xiaomin Chen and Mark J. Roberts (2001). Firm-level Evidence on Productivity Differentials and Turnover in Taiwanese Manufacturing. *Journal of Development Economics* 66: 51-86

Basker, Emek (2005a). Selling a Cheaper Mousetrap: Wal-Mart's Effect on Retail Prices. *Journal of Urban Economics* 58(2): 203-229

Basker, Emek (2005b). Job Creation or Destruction? Labor-Market Effects of Wal-Mart Expansion. *Review of Economics and Statistics* 87(1): 174-183

Basker, Emek (2007). The Causes and Consequences of Wal-Mart's Growth. *Journal of Economic Perspectives* 21(3) 177-198

Bertrand, Marianne, Esther Duflo and Sendhil Mullainathan (2004). How Much Should We Trust Difference-in-Differences Estimates? *The Quarterly Journal of Economics* Feb. 2004: 249-275

Blalock, Garrick and Paul Gertler (2008). Welfare Gains from Foreign Direct Investment through Technology Transfer to Local Suppliers. *Journal of International Economics*, 74(2):402-21

The Boston Consulting Group (2007). The Relentless Advance of Private Label: Strategies to Compete.

Caves, Douglas W., Laurits R. Christensen and W. Erwin Diewert (1982). Multilateral Comparisons of Output, Input and Productivity Using Superlative Index Numbers. *The Economic Journal* 92: 73-86

Chavez, Manuel (2002). The Transformation of Mexican Retailing with Nafta. *Development Policy Review*, *20*(4): 503-13

Dun & Bradstreet. *Dun & Bradstreet Business Report*

Dries, Liesbeth, Thomas Reardon and Johan F. M. Swinnen (2004). The Rapid Rise of Supermarkets in Central and Eastern Europe: Implications for the Agrifood Sector and Rural Development. *Development Policy Review 22*(5): 525-56.

Durand, Cedric (2007). Externalities from Foreign Direct Investment in the Mexican Retailing Sector. *Cambridge Journal of Economics*

Economist Intelligence Unit. Economist Intelligence Unit Country Profile: Romania. Various years.

Economist Intelligence Unit. Economist Intelligence Unit Industry Briefing, Romania: Consumer goods and retail background. Sep. 2002, Dec. 2003, Dec. 2004, Dec. 2005, Dec. 2006

Eschenbach, Felix and Bernard Hoekman (2006). Services Policy Reform and Economic Growth in Transition Economies, 1990-2004. *Review of World Economics/Weltwirtschaftlich*es Archiv 142(4): 746-764

Euromonitor International (2007) *World Retail Data and Statistics 2006/2007*

Euromonitor International (2006) *European Marketing Data and Statistics*

Fernandes, Ana (2006). Trade Policy, Trade Volumes and Plant-Level Productivity in Colombian Manufacturing Industries. *Journal of International Economics* 71: 52-71

Fernandes, Ana (2009). Structure and Performance of the Services Sector in Transition Economies. *Economics of Transition* 17(3): 467-501

Görg, Holger and David Greenaway (2004), Much Ado about Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment? *World Bank Research Observer* 19(2): 171-197

Görg, Holger and Eric Strobl (2001), Multinational Companies and Productivity Spillovers: A Meta-analysis *Economic Journal* 111: 723-739

Haskel, Jonathan E., Sonia C. Pereira, and Matthew J. Slaughter (2007). Does Inward Foreign Direct Investment Boost the Productivity of Domestic Firms? *Review of Economics and Statistics*, 89(2)

Head, Keith, Ran Jing and Deborah Swenson (2009). From Beijing to Bentonville: Do Multinational Retailers Link Markets? University of California, Davis, mimeo.

International Monetary Fund. *International Financial Statistics*

Javorcik, Beata S. (2004). Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers Through Backward Linkages. *American Economic Review* 94(3): 605-627

Javorcik, Beata S. and Yue Li (2008) Do the Biggest Aisles Serve a Brighter Future? Global Retail Chains and Their Implications for Romania. World Bank Policy Research Working Paper 4650

Javorcik, Beata S. and Gaia Narciso (2008). Differentiated Products and Evasion of Import Tariffs. *Journal of International Economics* 76(2): 208-222

Javorcik, Beata S. and Mariana Spatareanu (2010). Tough Love: Do Czech Suppliers Learn from Their Relationships with Multinationals? *Scandinavian Journal of Economics* forthcoming

Javorcik, Beata S., Wolfgang Keller and James R.Tybout (2008). Openness and Industrial Response in a Wal-Mart World: A Case Study of Mexican Soaps, Detergents and Surfactant Producers. *The World Economy,* 31(12)

Jia, Panle (2008) What Happens When Wal-Mart Comes to Town: An Empirical Analysis of the Discount Retailing Industry. *Econometrica* 76(6):1263 – 1316

Katayama, Haijime, Shihua Lu and James R.Tybout (2003). Why Plant-level Productivity Studies are Often Misleading, and an Alternative Approach to Inference. *NBER Working Paper* 9617

Klette, Tor Jacob and Zvi Griliches (1996). The Inconsistency of Common Scale Estimators When Output Prices Are Unobserved and Endogenous. *Journal of Applied Econometric.* 11(4): 343-361

Levinsohn, James and Amil Petrin (2003). Estimating Production Functions Using Inputs to Control for Unobservables. *Review of Economic Studies* 70(2): 317-341

Mairesse, Jacques and Jordi Jaumandreu (2005). Panel-data Estimates of the Production Function and the Revenue Function: What Difference Does It Make? *Scandinavian Journal of Economics* 107(4): 651-672

Mattoo, Aaditya and Lucy Payton (2007). Services Trade for Zambia's Developmentr: An Overview. *Services Trade & Development: The Experience of Zambia.* Palgrave and The World Bank: 22-24

Minten, Bart, Lalaina Randrianarison and Johan F.M. Swinnen (2005). Global Retail Chains and Poor Farmers: Evidence from Madagascar. Mimeo, Katholieke Universiteit Leuven

Olley, Steven and Ariel Pakes (1996). The Dynamics of Productivity in the Telecommunications Equipment Industry. *Econometrica* 64:1263-1295

Pavcnik, Nina (2002). Trade liberalization, Exit, and Productivity improvements: Evidence from Chilean Plants. *Review of Economic Studies* 69: 245-76

Reardon, Thomas and Julio Berdegue (2002). The Rapid Rise of Supermarket in Latin American: Challenges and Opportunities for Development. *Development Policy Review, 20*(4): 371-88

Reardon, T., C. P. Timmer, C. B. Barrett and J. Berdegue (2003). The Rise of Supermarkets in Africa, Asia, and Latin America. *American Journal of Agricultural Economics*, *85*(5): 1140-46

Statistical Institute of Romania. *Statistical Yearbook of Romania*

Swinnen, Johan F.M., Liesbeth Dries, Nivelin Noeva and Etleva Germenjia (2006). Foreign Investment, Supermarkets, and the Restructuring of Supply Chains: Evidence from Eastern European Dairy Sectors. *Working Paper*.

USDA Foreign Agriculture Service (2006). Global Agriculture Information Network (GAIN) Report, Aug. 30

Van Biesebroeck, Johannes (2007). Robustness of Productivity Estimates. *Journal of Industrial Economics* LV(3): 529-569

Appendix I Supplier premium

Table A1 Supplier premium

	ln(TFP index)	ln (TFP Ackerberg et al.)	ln(Labor productivity)
Supplier	0.125***	0.241***	0.275***
	(0.025)	(0.045)	(0.039)
Year before supplying	-0.024	-0.039	0.100
	(0.051)	(0.117)	(0.099)
Exporter	0.010	-0.086**	0.043
	(0.018)	(0.036)	(0.031)
Foreign ownership	0.055	0.173	0.273**
	(0.106)	(0.159)	(0.139)
State ownership	-0.057	-0.518***	-0.308***
	(0.064)	(0.105)	(0.096)
ln(capital/labor)			0.424***
			(0.018)
R-squared	0.185	0.372	0.485
No. of obs.	2252	2287	2297
F-test of Supplier = Year before supplying	7.553	5.401	2.861
p-value	0.006	0.02	0.091

All models include 2-digit industry, region and year fixed effects. Robust standard errors are reported in parentheses. * significant at 10%, ** at 5%, *** at 1%

In the regressions presented above, we combine data on firm performance (compiled based on the information from Amadeus data base and described in sections 4 and 6.3) with the time-varying information on whether or not a particular firm included in the World Bank enterprise survey supplies global retail chains. The sample includes 281 firms of which 49 supply at least one global retail chain. We use three measures of firm performance: a TFP index, a TFP measure estimated following Ackerberg et al. (2006) and labor productivity (value added per worker). We regress each measure of firm performance on an indicator variable taking the value of one if firm *i* supplies at time *t* a global retail chain operating in Romania and zero otherwise. We control for the firm's industry affiliation (2-digit NACE), its exporting status, foreign ownership and state ownership at time *t*. The information on the last three variables comes from the survey. We also include region and year fixed effects.

The results suggest that suppliers outperform other firms in terms of the TFP and labor productivity. The coefficient on the supplier dummy is positive and statistically significant in all three specifications. Depending on the performance measure used, the supplier premium ranges from 13 to 32 percent.

The supplier premium is not present in the year prior to the firm starting to supply a global retain chain. An additional indicator variable equal to one in the year preceding supplying a global retail chain (and zero otherwise) is not statistically significant in any of the specifications. Moreover, its coefficient is significantly different from the coefficient on the supplier dummy.

Appendix II Calculation of TFP index

Following Aw, Chen and Roberts (2001), we calculate the index according to

$$\ln TFP_{it} = (\ln Y_{it} - \overline{\ln Y_t}) + \sum_{\tau=2}^{t} (\overline{\ln Y_\tau} - \overline{\ln Y_{\tau-1}})$$

$$-[\sum_{j=1}^{m} \frac{1}{2}(S_{jit} + \overline{S}_{jt})(\ln X_{jit} - \overline{\ln X_{jt}}) + \sum_{\tau=2}^{t} \sum_{j=1}^{m} \frac{1}{2}(\overline{S_{j\tau}} + \overline{S_{j\tau-1}})(\overline{\ln X_{j\tau}} - \overline{\ln X_{j\tau-1}})]$$

i denotes firm, *t* denotes year, *j* denotes types of inputs. *Y* denotes output, which is measured in real terms. Inputs (*X*) include labor (number of employees), materials (real value of material costs), and capital stock. *S* denotes input shares, that is, the ratio of wage bill (or material costs) to output. The capital share is obtained from the assumption of constant returns to scale.

This index is an extension of the multilateral TFP index derived by Caves et al. (1982). It allows for consistent comparison of TFP in firm-level data with a panel structure. The first term in the definition of the index expresses firm output in year **t** as a deviation from the mean output in that year, thus capturing information on the cross-sectional distribution of output. The second term sums the change in the mean output across all years and captures the shift of the output distribution over time by chain-linking the movement in the output reference point. The remaining terms repeat the exercise for each input **j**. The inputs are summed using a combination of the input revenue share for the firm (**S_{jit}**) and the average revenue share in each year $\overline{S_{jt}}$ as weights. Thus the index is a measure of the proportional difference in TFP for firm **i** observed in year **t** relative to a hypothetical reference firm with average input costs shares, average logarithm of inputs and average logarithm of outputs operating in the same sector in the base year, 1997.

The index is calculated separately for each of the 3-digit NACE manufacturing sectors.

Figures

Figure 1 What were the effects of entry of foreign retail chains on the market in your city?
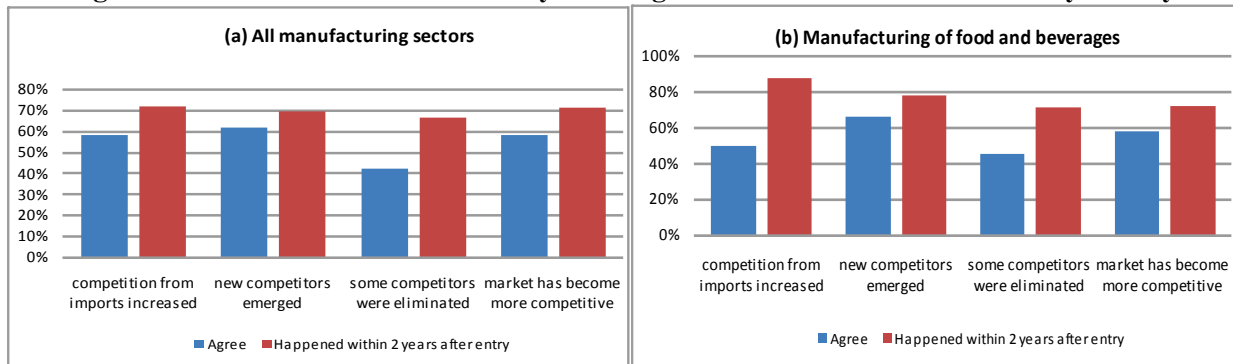
213 responses

62 responses

Figure 2 What happened after your company began to supply a foreign retail chain?
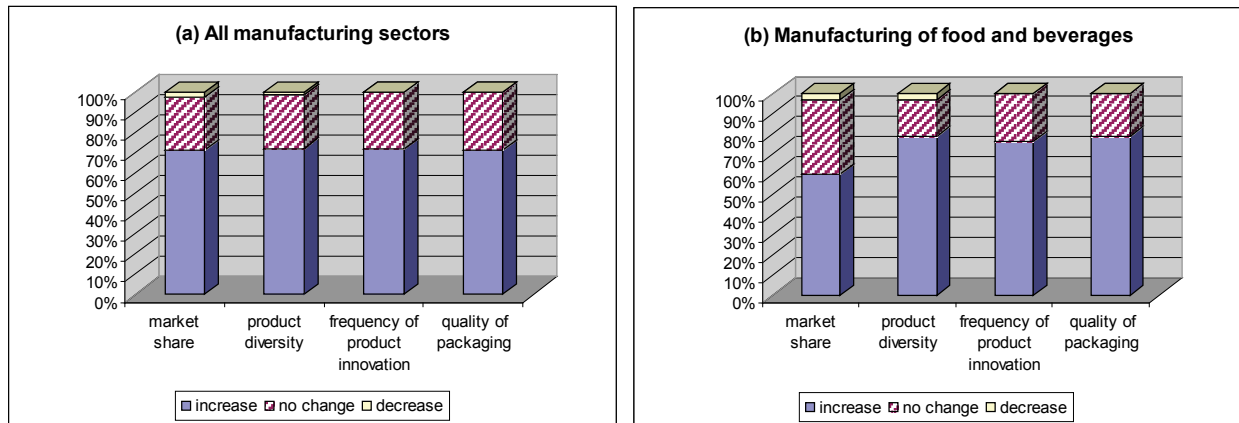
66-70 responses

33-35 responses

Figure 3 Was you company affected by the entry of foreign retail chains into your city? Respondents not supplying foreign retailers
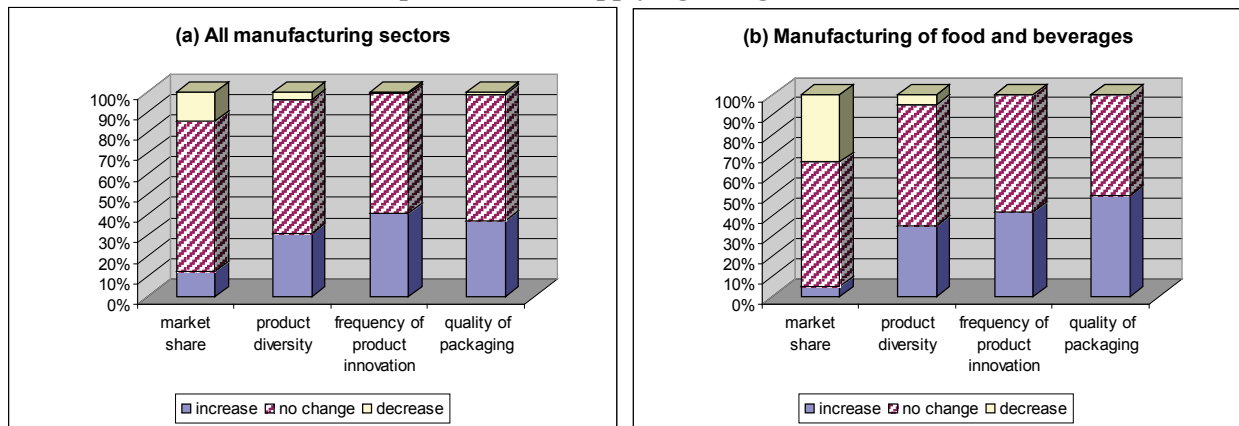
97-111 responses

19-21 responses

Figure 4 Regional Distribution of Global Retail Chains in Romania

1997

2005

31
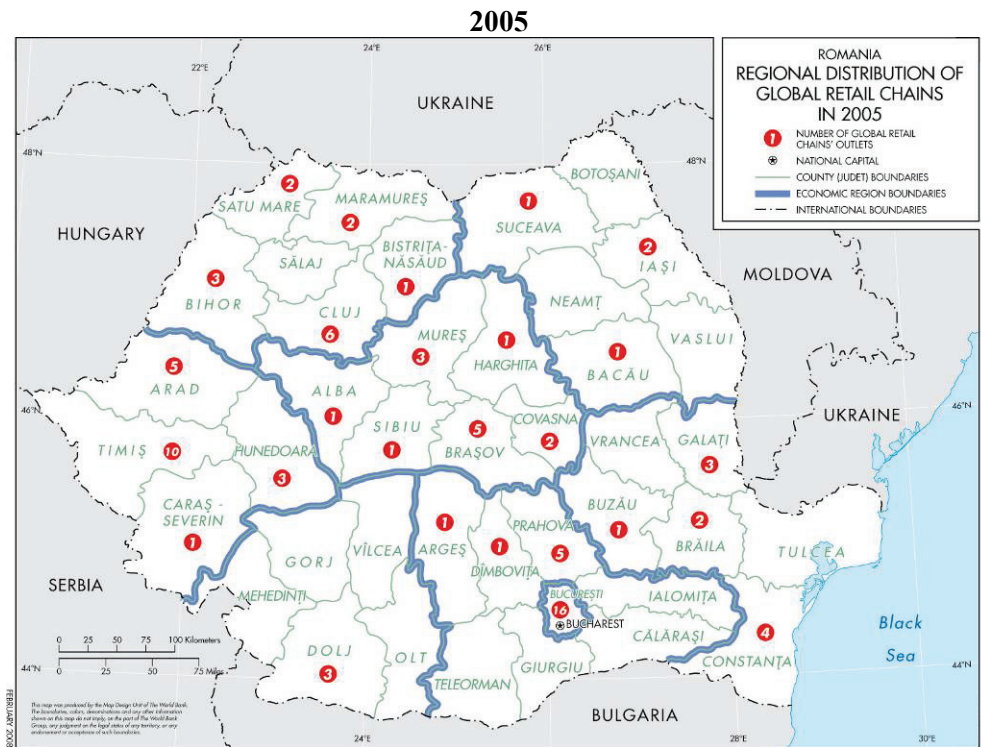
Figure 5 Logarithm of Total Factor Productivity of Manufacturing Firms Pre- vs. Post-entry of Global Chains, Firm-Level Data

Food Supplying Sectors
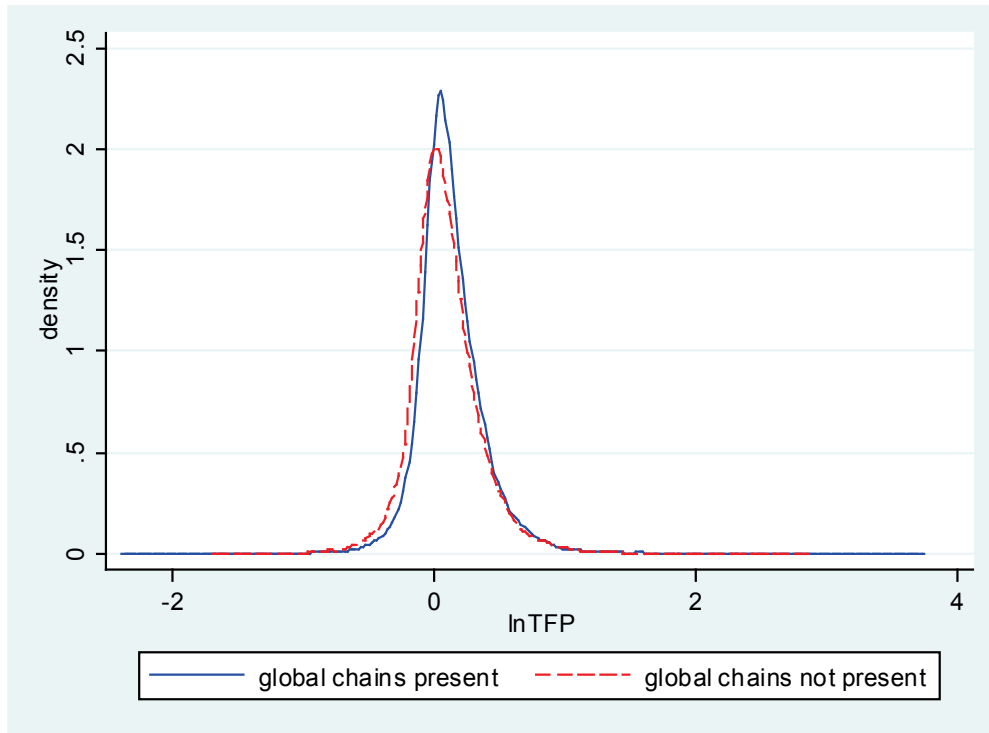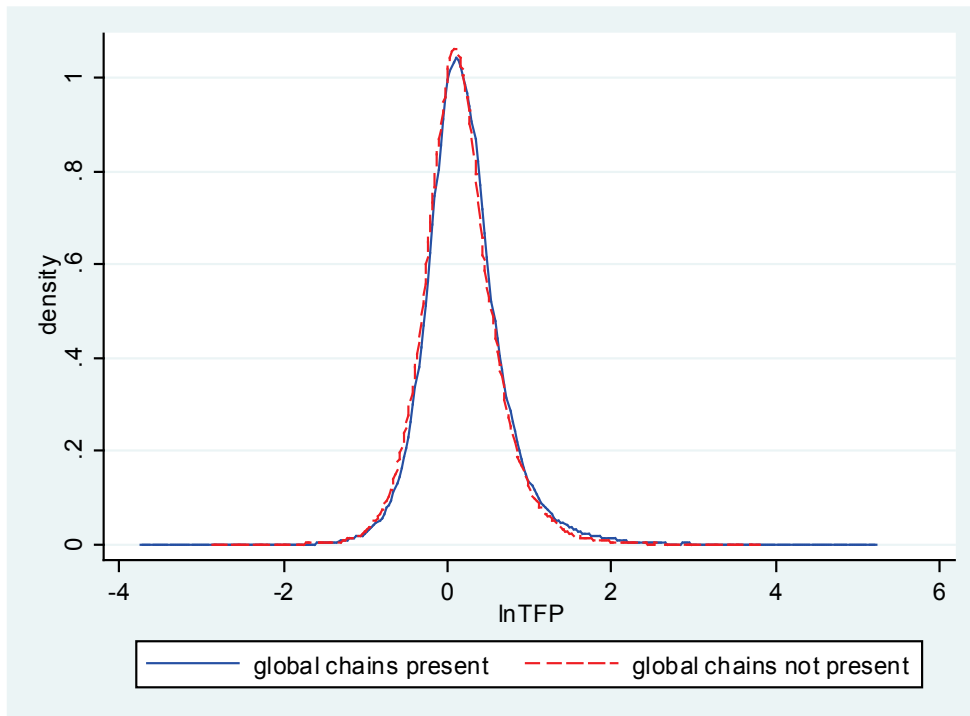
Other Sectors

**Figure 6 Logarithm of Total Factor Productivity of Manufacturing Firms
Pre- vs. Post-entry of Global Chains, Regional Average**

Food Supplying Sectors
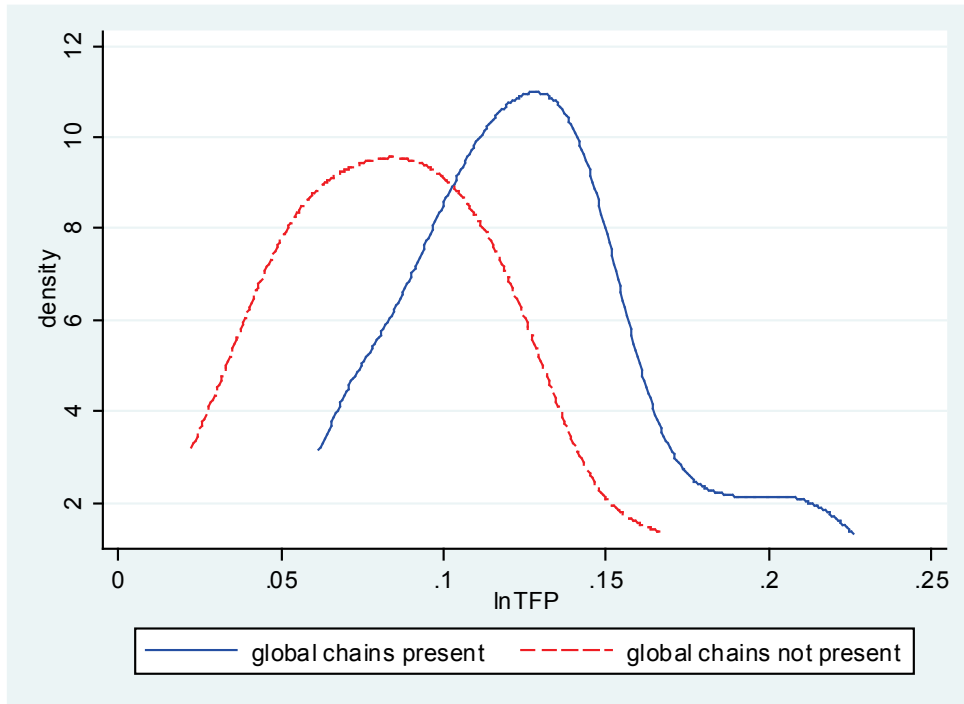
Other Sectors
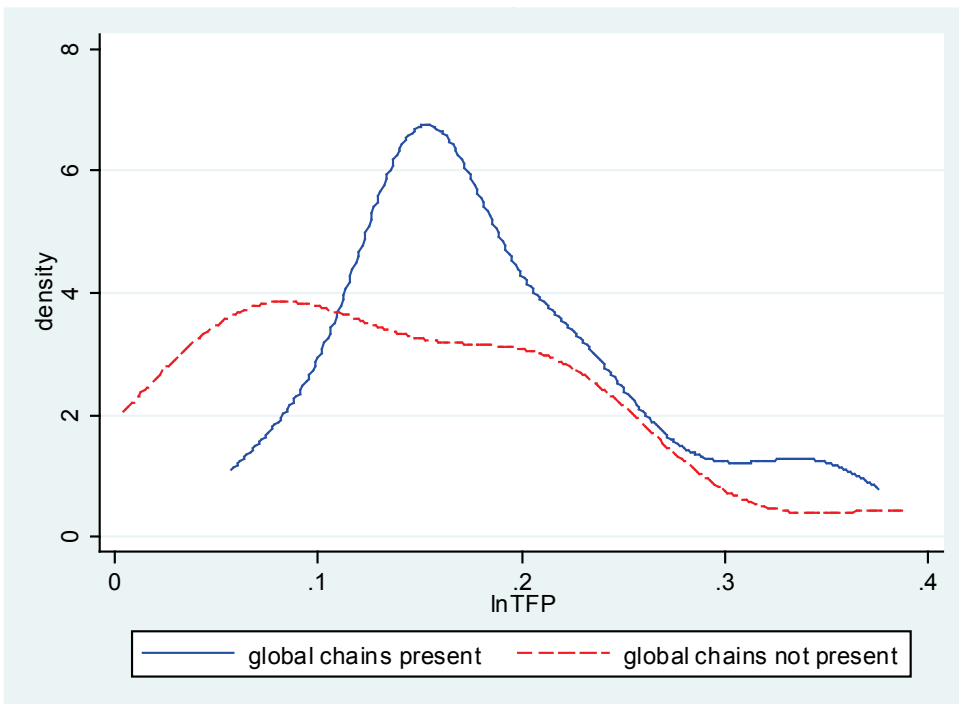
Table 1 Information on Global Retail Chains in Romania

Romanian subsidiary	parent	country of origin	year of entry	2005 employment	2005 capital stock (mn USD)	2005 sales (mn USD)
METRO CASH & CARRY ROMANIA	Metro	Germany	1997	6,197	257	1,544
SELGROS CASH & CARRY	Rewe	Germany	2001	3,933	172	533
HIPROMA SA	Carrefour	France	2001	2,695	176	462
ROMANIA HYPERMARCHE SA	Louis Delhaize	Belgium	2003	1,765	14	206
BILLA ROMANIA	REWE	Germany	1999	1,613	35	292
REWE (ROMANIA)	REWE	Germany	2001	877	8	108
MEGA IMAGE SA*	Delhaize	Belgium	2000	947	14	63
PROFI ROM FOOD	Louis Delhaize	Belgium	2000	401	10	45
KAUFLAND ROMANIA SCS*	Kaufland	Germany	2005	500	149	18

*outlet-specific information is not available

Table 2 Evolution of Global Retail Chains in Romania

year	number of global chains	number of outlets*	selling space (m²)*	employment	sales (mn USD)	share in total sales of retail sector	share in total sales of retail & wholesale sectors
1997	1	1	13,000	864	126	3.20%	1.30%
1998	1	3	39,000	1,431	198	4.60%	1.70%
1999	2	5	43,000	1,455	207	5.50%	1.80%
2000	4	13	90,686	2,961	306	7.40%	2.30%
2001	7	27	174,024	5,169	585	11.60%	3.60%
2002	7	42	254,317	8,239	959	15.10%	4.60%
2003	8	55	318,013	11,167	1,574	17.70%	5.40%
2004	8	68	390,220	14,243	2,632	20.20%	6.10%
2005	9	86	463,996	18,928	3,271	22.20%	6.90%

*This column pertains to 7 retail chains for which detailed information is available (see Table 2 for a list)

Table 3 Regional Expansion of Global Retail Chains in Romania

NUTS region	year of first entry	number of outlets		selling space (m^2)	
		2001	2005	2001	2005
Bucharest-Ilfov	1997	7	16	43,400	115,900
West	1998	8	19	22,266	62,495
Central	1998	3	13	23,958	69,560
Southeast	1999	2	10	15,000	58,500
South	2000	1	7	2,000	33,286
Northwest	2000	2	14	26,000	62,855
Northeast	2001	2	4	26,000	36,000
Southwest	2001	2	3	15,400	25,400

This table pertains to 7 retail chains for which detailed information is available
(see Table 2 for a list)

Table 4 Summary Statistics

Firm-specific

Variable	Food Sectors			Non-Food Sectors		
	No. of Obs.	Mean	Std. Dev.	No. of Obs.	Mean	Std. Dev.
TFP index	49498	0.116	0.279	171297	0.188	0.491
*TFP***	56772	0.356	0.857	188796	1.025	0.977
*value added/labor***(th lei 2000)*	58252	7.9	29.2	192698	13.2	39.9
capital stock/labor (th lei 2000)	58252	10.8	76.7	192698	10.4	74.1
output (th lei 2000)	58252	1041.3	7388.7	192698	1529.8	20328.3
wage costs (th lei 2000)	57234	85.2	604.5	188869	267.8	2442.5
material costs (th lei 2000)	58252	739.6	5090.6	192698	897.9	13812.3
capital stock (th lei 2000)	58252	354.5	3531.0	192698	694.7	13469.9
employment	58252	23.3	155.4	192698	56.8	343.1
firm age	58252	7.7	3.4	192698	7.3	3.6

NACE sector-specific

Variable	Food Sectors			Non-Food Sectors		
	No. of Obs.	Mean	Std. Dev.	No. of Obs.	Mean	Std. Dev.
Herfindahl Index	54	0.031	0.017	808	0.165	0.179
imports (th lei 2000)	54	169032.3	174615.6	793	628703.0	1006053.0
exports (th lei 2000)	54	48700.4	55999.3	793	565333.2	1466706.0

NUTS region-specific

Variable	No. of Obs.	Mean	Std. Dev.
wage/L (th lei 2000)	72	4.6	1.0
foreign chains present (dummy)	72	0.7	0.5
no. of foreign chain outlets	72	3.8	4.3
selling space of foreign chain outlets (sq. meters)	72	22273	24194
no. of foreign chain outlets / regional food output (per mn lei 2000)	72	0.0052	0.0056
selling space of foreign chains/ regional food output (sq. meters per mn lei 2000)	72	21.07	19.07
no. of foreign chain outlets / regional gross value added (per mn lei 2000)	64	0.0004	0.0003
selling space of foreign chains / regional gross value added (sq. m per mn lei 2000)	64	1.74	1.74

* TFP index calculated following Aw, Chen and Roberts (2001)

** TFP calculated following Ackerberg et al. (2006)

***value added/L = (sales – material costs)/employment

Table 5 Presence of Global Retailers and Performance of Food Producers
Fixed effects, TFP index

	chains present		ln(no. of outlets)		ln(selling space)		Normalized by the output of food sectors in the region				Normalized by gross value added of the region			
							ln(no. of outlets)		ln(selling space)		ln(no. of outlets)		ln(selling space)	
$Food_s$ *(global_chain)$_{r,t-1}$	0.047***	0.038***	0.037***	0.033***	0.005***	0.004***	0.044***	0.040***	0.005***	0.004***	0.039***	0.035***	0.005***	0.004***
	(0.010)	(0.010)	(0.005)	(0.005)	(0.001)	(0.001)	(0.007)	(0.006)	(0.001)	(0.001)	(0.006)	(0.006)	(0.001)	(0.001)
$ln(firm\ age)_{it}$	0.118***	0.117***	0.119***	0.118***	0.118***	0.117***	0.119***	0.118***	0.118***	0.117***	0.119***	0.118***	0.118***	0.117***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
$ln(imports)_{s,t-1}$		-0.029***		-0.020***		-0.027***		-0.021***		-0.027***		-0.020***		-0.027***
		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)
$ln(exports)_{s,t-1}$		-0.004		-0.004		-0.004		-0.004		-0.004		-0.004		-0.004
		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)
$Herfindahl\ Index_{st}$		-0.190***		-0.210***		-0.196***		-0.208***		-0.195***		-0.211***		-0.195***
		(0.040)		(0.039)		(0.040)		(0.040)		(0.040)		(0.039)		(0.040)
R-squared	0.019	0.02	0.02	0.021	0.019	0.02	0.02	0.021	0.019	0.02	0.02	0.021	0.019	0.02
No. of obs.	221236	220002	221236	220002	221236	220002	221236	220002	221236	220002	221236	220002	221236	220002
No. of firms	49552	49390	49552	49390	49552	49390	49552	49390	49552	49390	49552	49390	49552	49390

All models include firm fixed effects and region-year fixed effects. Standard errors, clustered at the region-year level, are reported in parentheses.
* significant at 10%, ** at 5%, *** at 1%

Table 6 Presence of Global Retailers and Performance of Food Producers
Fixed effects, TFP estimated following Ackerberg, Caves and Frazer (2006) and Labor Productivity

	chains present		ln(no. of outlets)		ln(selling space)		Normalized by the output of food sectors in the region				Normalized by gross value added of the region			
							ln(no. of outlets)		ln(selling space)		ln(no. of outlets)		ln(selling space)	
ln(TFP ACF)														
$Food_s$	0.089***	0.076***	0.060***	0.055***	0.010***	0.008***	0.076***	0.071***	0.010***	0.009***	0.065***	0.060***	0.010***	0.008***
*(global_chain)$_{r,t-1}$	(0.028)	(0.026)	(0.014)	(0.013)	(0.003)	(0.003)	(0.017)	(0.016)	(0.003)	(0.003)	(0.016)	(0.015)	(0.003)	(0.003)
Industry controls	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
R-squared	0.02	0.022	0.021	0.022	0.021	0.022	0.021	0.022	0.021	0.022	0.021	0.022	0.021	0.022
No. of obs.	245568	244197	245568	244197	245568	244197	245568	244197	245568	244197	245568	244197	245568	244197
No. of firms	51929	51764	51929	51764	51929	51764	51929	51764	51929	51764	51929	51764	51929	51764
ln(Labor productivity)														
$Food_s$	0.081***	0.066***	0.055***	0.049***	0.009***	0.007***	0.070***	0.062***	0.009***	0.008***	0.061***	0.053***	0.009***	0.007***
*(global_chain)$_{r,t-1}$	(0.025)	(0.024)	(0.013)	(0.012)	(0.002)	(0.002)	(0.016)	(0.015)	(0.003)	(0.002)	(0.015)	(0.014)	(0.003)	(0.002)
ln(capital/labor)$_{it}$	0.327***	0.328***	0.327***	0.328***	0.327***	0.328***	0.327***	0.328***	0.327***	0.328***	0.327***	0.328***	0.327***	0.328***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Industry controls	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
R-squared	0.108	0.109	0.108	0.109	0.108	0.109	0.108	0.109	0.108	0.109	0.108	0.109	0.108	0.109
No. of obs.	250950	249557	250950	249557	250950	249557	250950	249557	250950	249557	250950	249557	250950	249557
No. of firms	52081	51916	52081	51916	52081	51916	52081	51916	52081	51916	52081	51916	52081	51916

All models include a firm's age, firm fixed effects and region-year fixed effects. Industry-level controls include: $ln(imports)_{t-1}$, $ln(exports)_{t-1}$ and Herfindahl index$_t$.
Standard errors, clustered at the region-year level, are reported in parentheses.
* significant at 10%, ** at 5%, *** at 1%

Table 7 Presence of Global Retailers and Performance of Food Producers, Robustness Checks
Fixed effects, TFP index

	chains present		ln(no. of outlets)		ln(selling space)	
Excluding Bucharest						
$Food_s*(global\_chain)_{r,t-1}$	0.044***	0.036***	0.037***	0.034***	0.005***	0.004***
	(0.010)	(0.009)	(0.006)	(0.005)	(0.001)	(0.001)
Industry controls	no	yes	no	yes	no	yes
R-squared	0.02	0.021	0.021	0.022	0.02	0.021
No. of obs.	186892	185845	186892	185845	186892	185845
Controlling for regional wage						
$Food_s*(global\_chain)_{r,t-1}$	0.046***	0.036***	0.037***	0.034***	0.005***	0.004***
	(0.010)	(0.009)	(0.005)	(0.005)	(0.001)	(0.001)
$Food_s*(wage\_per\_L)_{r,t-1}$	-0.027	-0.033	-0.065	-0.065	-0.029	-0.033
	(0.053)	(0.050)	(0.052)	(0.051)	(0.052)	(0.050)
Industry controls	no	yes	no	yes	no	yes
R-squared	0.019	0.02	0.02	0.021	0.019	0.02
No. of obs.	221236	220002	221236	220002	221236	220002
High vs. low transport costs						
$Food_s*(global\_chain)_{r,t-1}$	0.035***	0.028***	0.030***	0.028***	0.004***	0.003***
	(0.010)	(0.009)	(0.005)	(0.005)	(0.001)	(0.001)
$High\ cost_s*Food_s*(global\_chain)_{r,t-1}$	0.028***	0.025***	0.016***	0.013***	0.003***	0.003***
	(0.007)	(0.008)	(0.004)	(0.004)	(0.001)	(0.001)
Industry controls	no	yes	no	yes	no	yes
R-squared	0.019	0.02	0.02	0.021	0.02	0.02
No. of obs.	221236	220002	221236	220002	221236	220002
Young vs. old firms						
$Food_s*(global\_chain)_{r,t-1}$	0.047***	0.038***	0.037***	0.033***	0.005***	0.004***
	(0.010)	(0.010)	(0.005)	(0.005)	(0.001)	(0.001)
$Young*Food_s*(global\_chain)_{r,t-1}$	0.001	0.007	0.015***	0.016***	0.000	0.001
	(0.007)	(0.007)	(0.004)	(0.004)	(0.001)	(0.001)
Industry controls	no	yes	no	yes	no	yes
R-squared	0.019	0.02	0.02	0.021	0.019	0.02
No. of obs.	221236	220002	221236	220002	221236	220002

All models include a firm's age, firm fixed effects and region-year fixed effects. Industry-level controls include: ln(imports)$_{t-1}$, ln(exports)$_{t-1}$ and Herfindahl index $_t$. Standard errors, clustered at the region-year level, are reported in parentheses.* significant at 10%, ** at 5%, *** at 1%

Table 8 Presence of Global Retailers and Performance of Food Producers, Specifications in Differences, TFP index

	chains present		ln(no. of outlets)		ln(selling space)	
First differences						
$Food_s*\Delta(global\_chain)_{r,t-1}$	0.021**	0.022***	0.034***	0.036***	0.003***	0.003***
	(0.008)	(0.008)	(0.008)	(0.007)	(0.001)	(0.001)
Industry controls	no	yes	no	yes	no	yes
R-squared	0.014	0.014	0.014	0.015	0.014	0.014
No. of obs.	164668	163623	164668	163623	164668	163623
Second differences						
$Food_s*\Delta(global\_chain)_{r,t-1}$	0.026*	0.028**	0.031***	0.035***	0.003**	0.004**
	(0.014)	(0.014)	(0.007)	(0.008)	(0.001)	(0.001)
Industry controls	no	yes	no	yes	no	yes
R-squared	0.014	0.014	0.014	0.015	0.014	0.014
No. of obs.	130181	129356	130181	129356	130181	129356
Long differences						
$Food_s*\Delta(global\_chain)_{r,t-1}$	0.172***	0.164***	0.074***	0.066***	0.016***	0.015***
	(0.012)	(0.015)	(0.008)	(0.007)	(0.001)	(0.001)
Industry controls	no	yes	no	yes	no	yes
R-squared	0.021	0.022	0.019	0.021	0.021	0.022
No. of obs.	11418	11346	11418	11346	11418	11346

Industry-level controls include: $\Delta\ln(imports)_{t-1}$, $\Delta\ln(exports)_{t-1}$ and ΔHerfindahl index $_{t-1}$.

All models in first and second differences include region-year fixed effects. Standard errors, clustered at the region-year level, are reported in parentheses.

Models in long difference include region fixed effects. The standard errors are clustered at the region level.

* significant at 10%, ** at 5%, *** at 1%

Table 9 Robustness Check on Autocorrelation
TFP index

First Stage Estimation

$ln(firm\ age)_{it}$	0.117***	0.117***
	(0.004)	(0.004)
$ln(imports)_{s,t-1}$	-0.038***	-0.038***
	(0.003)	(0.003)
$ln(exports)_{s,t-1}$	-0.004**	-0.004**
	(0.002)	(0.002)
$Herfindahl\ Index_{st}$	-0.152***	-0.152***
	(0.032)	(0.032)
R-squared	0.02	0.02
$No.\ of\ obs.$	220002	220002

Second Stage Estimation, only food producing sectors

$(global\_chain)_{r,t}$	0.028***	
	(0.002)	
$(global\_chain)_{r,t-1}$		0.024***
		(0.002)
R-squared	0.012	0.009
$No.\ of\ obs.$	14775	14588

First stage estimation includes firm fixed effects and region-year fixed effects.
Standard errors are reported in parentheses.
* significant at 10%, ** at 5%, *** at 1%

Table 10 Pre-entry Impact
Fixed effects, TFP index

	chains present		ln(no. of outlets)		ln(selling space)	
$Food_s*(global\_chain)_{r,t-1}$	0.045***	0.035***	0.036***	0.032***	0.005***	0.004***
	(0.012)	(0.011)	(0.006)	(0.006)	(0.001)	(0.001)
$Food_s*(1\_year\_before)_{r,t}$	-0.008	-0.010	-0.005	-0.007	-0.005	-0.007
	(0.015)	(0.015)	(0.014)	(0.014)	(0.015)	(0.015)
$ln(firm\ age)_{it}$	0.118***	0.117***	0.119***	0.118***	0.118***	0.117***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
$ln(imports)_{s,t-1}$		-0.029***		-0.020***		-0.027***
		(0.005)		(0.005)		(0.005)
$ln(exports)_{s,t-1}$		-0.004		-0.004		-0.004
		(0.004)		(0.004)		(0.004)
$Herfindahl\ Index_{st}$		-0.189***		-0.210***		-0.196***
		(0.040)		(0.039)		(0.040)
F test on $Food*(global\_chain)$ $= Food*(1\_year\_before)$	14.90	10.62	n.a.	n.a.	n.a.	n.a.
p-value of F test	0.000	0.002	n.a.	n.a.	n.a.	n.a.
R-squared	0.019	0.02	0.02	0.021	0.019	0.02
No. of obs.	221236	220002	221236	220002	221236	220002

All models include firm fixed effects and region-year fixed effects.
Standard errors, clustered at the region-year level, are reported in parentheses.
* significant at 10%, ** at 5%, *** at 1%
n.a. stands for non applicable

Table 11 IV Approach
Fixed effects, TFP index

First Stage Estimation

	chains present		ln(no. of outlets)		ln(selling space)	
sale_share_{sr} *	-0.522***	-1.049***	-4.251***	-5.402***	-8.409***	-14.04***
ln(global_chain_in_1stWave_&_Romania)_t	(0.066)	(0.063)	(0.113)	(0.105)	(0.654)	(0.622)
sale_share_{sr} *	6.696***	8.520***	7.146***	11.118***	65.222***	84.732***
ln(global_chain_1stWave_only)_t	(0.197)	(0.190)	(0.338)	(0.314)	(1.953)	(1.861)
sale_share_{sr} *	0.005	-0.066***	-0.163***	-0.316***	-0.223**	-0.979***
ln(global_chain_in_2ndWave_&_Romania)_t	(0.011)	(0.011)	(0.019)	(0.018)	(0.112)	(0.106)
sale_share_{sr} *	-4.949***	-7.145***	6.610***	1.808***	-37.04***	-60.55***
ln(global_chain_2ndWave_only)_t	(0.174)	(0.168)	(0.298)	(0.277)	(1.721)	(1.644)
ln(firm age)_{it}	-0.018***	-0.012***	-0.069***	-0.056***	-0.220***	-0.154***
	(0.003)	(0.002)	(0.004)	(0.004)	(0.025)	(0.024)
ln(imports)_{s,t-1}		-0.209***		-0.465***		-2.243***
		(0.002)		(0.003)		(0.016)
ln(exports)_{s,t-1}		-0.013***		-0.005***		-0.121***
		(0.001)		(0.002)		(0.011)
Herfindahl Index_{st}		0.669***		1.112***		6.792***
		(0.020)		(0.033)		(0.196)
R-squared	0.324	0.388	0.348	0.451	0.328	0.403
No. of obs.	211538	210229	211538	210229	211538	210229
Shea's Partial R-squared	0.102	0.077	0.153	0.117	0.111	0.083
p-value of F test	0.00	0.00	0.00	0.00	0.00	0.00
p-value of underidentification test	0.00	0.00	0.00	0.00	0.00	0.00

Second Stage Estimation

Food_s(global_chain)_{r,t-1}*	0.024**	0.024*	0.012**	0.011*	0.002**	0.002*
	(0.011)	(0.013)	(0.005)	(0.006)	(0.001)	(0.001)
ln(firm age)_{it}	0.117***	0.117***	0.117***	0.117***	0.117***	0.117***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
ln(imports)_{s,t-1}		-0.032***		-0.032***		-0.032***
		(0.004)		(0.004)		(0.004)
ln(exports)_{s,t-1}		-0.004**		-0.004**		-0.004**
		(0.002)		(0.002)		(0.002)
Herfindahl Index_{st}		-0.175***		-0.171***		-0.176***
		(0.034)		(0.034)		(0.034)
R-squared	0.019	0.02	0.019	0.02	0.019	0.02
No. of obs.	211538	210229	211538	210229	211538	210229
p-value of Sargan test	0.734	0.308	0.916	0.272	0.818	0.327

All models include firm fixed effects and region-year fixed effects. Robust standard errors are reported in parentheses.
* significant at 10%, ** at 5%, *** at 1%

Table 12 Effects on Firms of Different Sizes
Fixed effects, TFP index

	chains present	ln(no. of outlets)	ln(selling space)
Employment > 25			
Food$_s$(global_chain)$_{r,t-1}$*	0.077***	0.061***	0.009***
	(0.013)	(0.007)	(0.001)
R-squared	0.03	0.03	0.03
No. of obs.	48322	48322	48322
Employment <= 25			
Food$_s$(global_chain)$_{r,t-1}$*	0.027***	0.023***	0.003***
	(0.010)	(0.005)	(0.001)
R-squared	0.021	0.021	0.021
No. of obs.	171680	171680	171680
Employment <= 15			
Food$_s$(global_chain)$_{r,t-1}$*	0.025**	0.021***	0.003***
	(0.010)	(0.005)	(0.001)
R-squared	0.023	0.023	0.023
No. of obs.	150312	150312	150312
Employment <= 5			
Food$_s$(global_chain)$_{r,t-1}$*	0.021*	0.020***	0.002**
	(0.012)	(0.006)	(0.001)
R-squared	0.028	0.029	0.029
No. of obs.	86987	86987	86987

All models include a firm's age, firm fixed effects and region-year fixed effects as well as industry-level controls: ln(imports)$_{t-1}$, ln(exports)$_{t-1}$ and Herfindahl index$_t$.
Standard errors, clustered at the region-year level, are reported in parentheses.
* significant at 10%, ** at 5%, *** at 1%