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Abstract

Based on a review of recent economic theories dealing with the internationalisation of firms and a discussion of necessary adaptations of these theories to special features of the retail trade sector, this technical report offers an empirical analysis of the determinants of the extensive and intensive margin of retail trade FDI activities of 42 countries in 23 EU countries. Special attention is paid within a gravity model framework to the impact of service trade restrictions on both margins of retail trade internationalisation. The use of hurdle models for count data to estimate the determinants of the extensive margin takes into account that there are a lot of zero counts for the number of retail trade firms controlled by a country *j* in an EU country *i*. The estimation results for the extensive margin of retail trade FDI activities show that service trade restrictiveness increases the hurdle that at least one firm from country *j* controls a retail trade firm in country *i*. Once one firm from country *j* has been able to jump over this hurdle, the existing service trade restrictions are neither a relevant factor for the number of following firms from country *j* in that market nor for the average employment and sales of these firms.

Keywords: Economic integration, multinational enterprises, foreign direct investment, entry modes, location decisions, retail trade, service trade restrictions, count data model, hurdle model

JEL classification: F15, F23, L51, L81, R12, R30, C21, C25

1. Introduction

The reduction of regulatory restrictions is arguably the most strongly advocated policy for improving economic performance in EU countries, particularly in many service activities, where regulatory barriers to trade and competition are still widespread. Following the consolidation of the Single Market for goods, attention focuses now on the integration of service markets. Beside other policy measures, this requires the elimination of obstacles and barriers to integration that originate from service trade restrictions and anti-competitive product market regulations. Policy efforts to spur this integration comprise a range of measures and proposals starting with the 2006 Services Directive and more recently the Single Market Strategy adopted in October 2015. The latter announced that the European Commission "will set out best practices for facilitating retail establishment and reducing operational restrictions in the Single Market. These will provide guidance for Member States to reforms and priority-setting for enforcement policy in the retail sector".

Actually, retail and wholesale trade are one of the largest services sectors in the EU. Retail trade services alone represent in 2015 4.5% of gross value added and 8.6% of employment in the EU countries. Retail and wholesale trade, which are closely linked, together generate 10% of EU value added and employ 13% of the total workforce (EU, 2018). Furthermore, the functioning of the retail market affects the whole economy, because of its size and also because of its linkages with other sectors of the economy. It is also important for consumers, who spend about 30% of their total consumption expenditures in retail shops.

Traditionally, retailers are seen as economic agents that only exist to resolve the spatial non-incidence between producers and consumers. They buy goods from manufacturers (and/or intermediaries) and make them available to consumers. This should happen at the lowest possible cost, meaning that the difference between prices paid upstream and charged downstream should not exceed the distribution costs and the reference distribution cost coincide with the gross margin of the most efficient retail format (Pellegrini, 2000). According to Pellegrini (2000), this view might have been a reasonable approximation of the role of this sector when it consists of a very large number of small independent shops that could not interfere in the relationship between manufacturers and consumers. However, it is certainly not admissible for the modern retail trade sector with its high degree of complexity, where many different store formats exist and many retail firms are larger and have bigger bargaining power than most of their suppliers. Changes can also be observed with regard to the market structure of the retail trade sector, which usually has been characterised by monopolistic competition, with low entry barriers, high entry and exit rates and a large number of competitors whose size is relatively small. Although this picture remains partly true, recent changes in some segments of the

industry, such as food retailing, suggest a move towards rising concentration and retailer power (Boylaud and Nicoletti, 2001; Dobson and Waterson, 1997; Hewitt, 2000).

A further trend is the rising internationalisation of retail trade activities. Due to the simultaneity of production and consumption of retail trade services, retailers usually cannot export their services and have to be in any way physically located where their customers are. Thus, there is only a limited number of retailers' entry modes into foreign markets. Generally, the literature differentiates between non-equity contractual modes (i.e. franchising, management contracts or licensing) and equity modes such as wholly owned subsidiaries (Petersen and Welch, 2000; Falk, 2016). Equity modes are always associated with foreign direct investment (FDI) and often as a consequence foreign controlled firms.

The available Foreign Affiliates Statistics (FATS) data of Eurostat show for a group of 16 EU countries that the number of foreign controlled retail trade firms increased from 4,185 firms in 2003 to 10,241 firms in 2015. For a larger group of 24 EU countries the number of these firms grew from 12,058 firms in 2008 to 14,773 firms in 2015.[1] Similarly, the sales of foreign controlled retail trade firms rose from 107 billion Euro in 2003 to 267 billion Euro in 2015 for the group of 16 EU countries. For the group of 24 EU countries there was an increase from 419 billion Euro in 2008 to 517 billion Euro in 2015. For all 28 EU countries the sales of foreign controlled retail trade firms moved from 419 billion Euro in 2010 to 540 billion Euro in 2015. A considerable growth of employment in foreign controlled retail trade firms can also be observed. It rose from 542 thousand persons in 2003 to 1.21 million persons in 2015 for the group of 16 EU countries and from 2.21 million person in 2008 to 2.67 million person in 2015 for a group of 25 countries. For all 28 EU countries employment in foreign controlled retail trade firms ascended from 2.27 million persons in 2010 to 2.71 million persons in 2015.

Although the overall internationalisation of retail trade activities is increasing, there might by considerable negative effects of relatively large service trade restrictions for the distribution sector in several EU countries, because commercial presence in a foreign country is an important mode of service trade and several service trade restrictions concern the entry into foreign markets.[2]

In this paper, I analyse the impact of service trade restrictions on the activities of foreign controlled retail trade firms in the EU. The analysis differentiates between the extensive and intensive margin of these activities and uses in a broader gravity model framework sector data for country pairs of the number (the

[1] The data collection for the FATS database is mandatory since 2007, so that data for most EU countries is available since 2008. However, data for some EU countries is not published, mainly because of confidentiality issues.

[2] The WTO defines four modes of service trade: (1) cross border provision, (2) consumption abroad, (3) commercial presence, and (4) temporary movement of natural persons.

extensive margin) and average employment as well as average sales (the intensive margin) of retail trade firms in 23 EU countries controlled by 42 EU and non-EU countries.

With its focus on retail trade internationalisation in a international economics framework frame and its use of sector data, this analysis extends the existing literature in several directions. Prior applications of the main approaches from the economic and industrial organisation literature to explain the internationalisation of firms and their entry mode choices aim rather generally at services or business services, but do not take specific features of the retail trade sector into account. Even studies empirically focussing at the distribution sector do not consider these sector's specifics in their underlying theoretical framework (e.g. Tanaka, 2015). Empirical evidence for the retail trade sector is either limited to narrative analysis and case studies in the management and business administration literature, which also provide a large amount of often anecdotal evidence concerning the internationalisation of retailers, or to few econometric analysis with firm level data (e.g. Mohr and Batsakis, 2018; Tanaka, 2015). Some studies based on sector data explicitly exclude the retail sector (e.g. Nordas and Rouzet, 2017; Brainard, 1997). Methodologically, the econometric analysis of the extensive margin of retail trade internationalisation has to deal with a lot of "true" zero counts for the number of retail firms controlled by a specific country in a certain EU country. I use hurdle negative binomial models to capture this feature of the data adequately.

The main results can be summarised as follows. The gravity model-type explanatory variables derived from the review of the theoretical literature provide are well suited to explain the extensive and intensive margin for bilateral retail trade FDI activities. With regard to service trade restrictions, the estimation results for the extensive margin of retail trade FDI activities show that service trade restrictiveness, especially restrictions on foreign entry, but also most of the measures from other policy areas, increases the hurdle that at least one firm from a specific source country controls a retail trade firm in a certain EU host country. Once one firm from this source country has been able to jump over the hurdle to enter the retail trade sector in a certain EU host country, the existing service trade restrictions are neither a relevant factor for the number of following firms from this source country j in that market nor for the average employment or average sales of these firms.

The remainder of the paper is structured as follows. Section 2 presents the theoretical background of the empirical analysis. The main recent general approaches from the economic literature to explain the internationalisation of firms are reviewed and it is discussed whether these approaches are sufficient to explain the internationalisation of retail trade services or whether they have to be modified to capture specific features of this sector. Section 3 describes the empirical method-

ology and the data used. It also includes some descriptive statistics. Section 4 discusses the estimation results for the determinants of the extensive and intensive margin of retail trade FDI activities. Section 5 draws some conclusions.

2. Theoretical Background

From a theoretical point of view, there has been a growing interest in the analysis of the internationalisation of retail trade, because particular characteristics of retail trade services seem to curb the transferability of theoretical and empirical insights based on the internationalisation of manufacturing firms (Mohr and Batsakis, 2018). Most important among this particular characteristics is the simultaneity of production and consumption of retail trade services. Thus, retailers usually cannot export their services and have to be in any way physically located where their customers are. Today, in the age of the Internet and telecommunications, the barriers to mobility have fallen in fact for a number of services, because due to very low communication costs, it is some times no longer necessary for customers and suppliers to be in the same place in order to guarantee the simultaneous temporal coincidence of service production and consumption (Harris, 1998; Blind and Jungmittag, 2004). However, online retail trade can replace conventional retail trade only to a certain extent in some branches.

Due to the mostly needed direct interaction with final consumers, there is only a limited number of retailers' entry modes into foreign markets. Generally, the literature differentiates between non-equity contractual modes (i.e. franchising, management contracts or licensing) and equity modes such as wholly owned subsidiaries (Petersen and Welch, 2000; Falk, 2016).

A wholly owned subsidiary is always associated with FDI, either as greenfield investment (a new entity being built from scratch), a cross-border acquisition of a local business or the merger with a local business. In the retail trade sector, acquisition-based mergers are a very commonly used form of mergers in the internationalisation process, as one retailer buys or takes over another and incorporates it into an existing business model (Dakora and Bytheway, 2014).

A very popular contractual entry mode in the retail trade sector is franchising, where the core firm (franchisor) supplies key inputs to one or more local entrepreneurs in different countries (franchisees) through long-term contracts that allow the use of its brand name under restrictive conditions (Miozzo and Soete, 2001). It is i.e. the dominant form of internationalisation in fashion retailing. According to Sternquist (2007), there are three reasons why retailers choose franchising as an international entry mode: the intention (1) to expand limited resources, (2) to improve administrative efficiency, and (3) to transfer risk to other entrepreneurs. Furthermore, two types of franchising in foreign markets can be

differentiated (Petersen and Welch, 2000). The first type is direct franchising, where the franchisor sets up each individual franchise and manages the resulting network in the foreign market directly. The second type is master franchising (or licensing), where a independent company in the host country is licensed to set up (by selling local sub-franchises), develop and manage the franchising operation in the foreign market. Similar to master franchising is the concept of area development, where a independent company is licensed to set up, develop and manage individual units within an assigned area, but these units are owned by the area developer rather than by the sub-franchisers.[3] Actually, the latter two modes of entry favour the franchisor, since most of the work to enter into an foreign market is done by the master franchiser or area developer (Quinn and Alexander, 2002). This makes the expansion easier and more cost efficient, because the master franchiser has a better understanding of the local market conditions and can better handle cultural differences, language barriers as well as bureaucratic and political problems (Dakora and Bytheway, 2014).

A third usable entry mode into foreign markets are joint ventures and strategic alliances. These are business partnership arrangements between retailers based in different countries, mostly initiated by a retailer who wants to expand its operations into a foreign market. Strategic alliances are often formed by two or more companies with mutual needs, inclusively risk sharing and achieving common goals. They are normally linked to long-term plans and objectives in order to improve the competitiveness of the participating firms. Dakora and Bytheway (2014) point out that strategic alliances must be mutually beneficial and have common objectives, so that power and control are not necessarily important. International joint ventures are also agreements between two or more independent retailers in different countries to pool their capabilities and resources in order to operate in one country. However, while a strategic alliance is typically a non-equity contractual cooperation, joint ventures can be either equity- or non-equity based arrangements (Hollensen, 2007). Thus, depending on the kind of the contractual agreement, an international joint venture can be the same as a strategic alliance.

There are various theoretical approaches in the literature to explain the internationalisation of firms and their entry mode choices. In the following we survey the main recent approaches from the economic and industrial organization literature. In each case starting from a general approach, it is discussed whether the respective approach is sufficient to explain the internationalisation of retail trade services or whether it has to be modified.[4] On the one hand, this survey has its

[3]There are some franchisors that enter foreign markets via equity-based modes that include wholly owned subsidiaries and joint ventures in addition to master franchising, area development and direct franchising. However, this group of franchisors relative to the total number of franchisors is normally small (Dunning et al., 2007).

[4]Narrative analysis and case studies in the management and business administration literature

intrinsic value, but, on the other hand, it also provides important hints for the choice of the explanatory variables in the regression models used to explain the extensive and intensive margin of sales and employment of foreign controlled retail firms in the EU.

2.1 The Eclectic OLI Approach

In the general economic literature about the internationalisation of firms, FDI, exports and licensing are considered as the three modes of entry into a foreign market. Thus, when deciding on FDI, the question arises whether this mode of entry is superior to exports or licensing. Since the late seventies, Dunning's (1977, 1979 and 1981) eclectic approach, also knows as OLI paradigm, provides a standard tool to answer this question. FDI is the adequate mode of entry, if firm-specific or ownership advantages (O), location-specific advantages (L) and internalisation advantages (I) coincide. Licensing or other contractual solutions can come about solely due to the existence of firm-specific advantages, e.g. due to development of a new or differentiated product. Exports are the preferred solution if there are also internalisation advantages additional to the firm-specific advantages., e.g. because certain rights of disposition cannot be protected by contractual solutions against possible abuse. FDI is only a profitable alternative to exports if a firm also possesses location specific advantages concurrently to firm-specific and internalisation advantages. Thus, the two latter advantages are a necessary condition and only location-specific advantages are a sufficient condition for FDI being the superior entry mode into foreign markets.

Boddewyn et al. (1986), Williams (1997) as well as Ramasamy and Yeung (2010) argue that the eclectic OLI approach also can explain the motivation for FDI of service firms and that there is no need for services-specific theories. Dunning and Norman (1987) show that the firm-specific advantages of service firms originate from their access to information and markets, economies of scale from dispersing fixed organisational and managerial costs over a larger market, and the goodwill coming from their brand names. However, with regard to the location-specific advantages, Bodewyn et al. (1986) identify some distinct factors relevant for service firms. First, FDI restrictions are often stronger for services than for manufacturing. Secondly, the need to adapt services to local requirements are due to differences in culture and language probably greater than in the manufacturing sector. Thirdly, often local subsidiaries are the only mode to sell services in foreign markets. Finally,

also provide a large amount of often anecdotal evidence concerning the internationalisation of retailers and a rich set of hypotheses on their motives and choices of entry modes. However, with only a few exceptions, these studies do not try to establish a link to the main stream of research on the internationalisation of firms in the economic and industrial organisation literature (Pellegrini, 1991).

technological specifications and property rights protection commonly available to the production of goods are often absent for service operations (Ramasamy and Yeung, 2010).

Pellegrini (1991) and Sternquist (1997) argue that Dunning's eclectic model of internationalisation can be applied to retail trade if a number of peculiarities with regard to the meaning of ownership, location and internalisation advantages are taken into account. Pellegrini (1991) mentions four issues that seem to be particularly relevant:

1. There are three types of retail innovations that always have to be judged with respect to the target market.[5] The first are product innovations, i.e. new formats of retail trade or formats with differentiated features which offer a better service to some consumers. Secondly, process innovations, i.e. reducing the costs of a service or retail format that already exists in the target country, allow to lower prices or increase service levels while taking the same prices as the local rivals. Both can also be realised due to economies or scale and/or scope. Thirdly, there are innovations with regard to the goods sold in the target market.

2. The idea behind a new retail concept and the organisational efforts required to implement it are difficult to defend from imitators. Hence, the appropriability of retail trade knowledge is limited due to its public good character and a firm needs an organisational lead to its rivals in order to maintain its competitive advantage.

3. The production of retail services includes functions realised centrally and at the points of sales. For a given retail format, economies of scale are mostly realised in the centralized functions. Furthermore, the costs of goods to resale can decrease with the overall volume of sales due to higher discounts obtained from manufacturers.

4. As already mentioned, retail services cannot be exported. Retail firms that have some ownership advantages have only two options: they can either sell their knowledge through a contract or become directly involved in retailing in a foreign market. Thus, retailing FDI can be a answer to growth problems that manufacturers can simply solve by exports.

These particular issues of retailing have direct implications for ownership, location-specific and internalisation advantages (Pellegrini, 1991, 2003).

[5] Pellegrini (1991) listed only the first two of the following innovation types, the third is added in Pellegrini (2003).

Ownership advantages can result from the three types of retail innovations and economies of scale or scope that can be realised due to the internationalisation. Combining the three kinds of innovation advantages, there are five positions with a competitive advantage in the target market (Pellegrini, 2003):

1. New format and new (exclusive) goods.
2. Better and/or lower priced service with new goods.
3. Existing format with new goods.
4. New format with existing goods.
5. Better and/or lower priced service with existing goods.

There is no innovation or cost advantage, if a foreign firm use the same format, effectiveness, efficiency and goods as the local incumbents.

Sternquist (1997) differentiates between global and multinational retailers. Global retailers expand with a standard retail concept (centralized management), which they reproduce in each new foreign market. Firms with strong ownership advantages will choose such a global expansion model and expand to markets with a segment of consumers that will consider their product offering favourable. Park and Sternquist (2008) propose with regard to the links between ownership advantages and entry modes to foreign markets that, commonly, a global retailer with a unique retail concept or a unique capability has an ownership advantage, and, the more unique the retail concept or capability, the more likely a global retailer will use the wholly owned entry mode. Furthermore, normally, a global retailer having a private brand with a unique concept has an ownership advantage, and, the more unique the brand or its concept, the more likely a global retailer will use the wholly owned entry mode. Multinational retailers, on the other hand, choose to enter foreign markets with location-specific advantages and use a decentralised format.

Location-specific advantages play only a relative role, since retail services are untradable. Thus, the markets are isolated and arbitrage through foreign trade is impossible. Important is the suitability of a host country with regard to a firm's strategy (Pellegrini, 1991). Sternquist (1997) differentiates with regard to the location-specific advantages between push and pull factors. Push factors are circumstances that make the home market less attractive. Examples are product market regulations that restrict domestic expansion, increased taxes or saturated home markets. Pull factors are circumstances that make a foreign market attractive. Since, in the empirical analysis, all observable and unobservable differences between home countries are captured by fixed country-effects, we focus in the following on the pull factors.

The first important pull factor for suitability of a foreign market is cultural proximity, given that retailers are more directly exposed to consumers than manufacturers (Pellegrini, 1991; Evans and Bridson, 2005; Mohr and Batsakis, 2018). Most retailers sell a very large assortment of goods, and the greater the cultural distance and thus the farther apart the consumption patterns of the host and the source country, the more the firm must revise its original innovative concept. Thus, it can be expected that cultural proximity play an important role in the choice of host countries for the FDI of mass retailers, while it is less important for the location choices of retailers which target at narrow defined consumer groups which are more similar across countries (Pellegrini, 1991; Sternquist, 1997). Furthermore, FDI into foreign markets with a greater cultural distance leads to greater resource commitments as it requires greater amounts of information collection and analysis compared to FDI in culturally close markets (Mohr and Batsakis, 2018). Based on several empirical studies, Gollnhofer and Turkina (2015) hypothesise that cultural distance hampers a firm's ability to master a foreign environment, and internationalising retailers are expected to rely on lower resource commitment entry modes, where less capital is at stake but local experience and abilities are large through a local franchisee or joint venture partner. Figure 1 shows their hypothesised interplay between cultural distance, perceived country risk, resource commitment, control and entry mode choice.[6]

The second important pull factor for suitability is the market size in the host country. If the decision to enter a foreign market is the consequence of limited growth perspectives in the home market, the size of the host country's market matters. This is all the more relevant if the international transfer of a retail concept requires substantial adaptations (Pellegrini, 1991). Furthermore, the possibilities for the exploitation of economies of scale or scope also depend on host countries' market sizes.

Thirdly, the moves of competitors can also be relevant and affect the choice of the market in which to enter, since a first mover advantage can be at stake (Pellegrini, 1991).

Sternquist (1997) adds two further pull factors to the three factors listed by Pellegrini (1991), which are standard in empirical models aiming at explaining the internationalisation of firms. The first factor is geographic proximity, because expanding closer to the home country reduces transaction costs related to transportation and corporate corporate communication. Obviously, it can be expected that geographic proximity is more important for retailers selling private labels that they produce in a central location, while it is less important for decentralised companies that operate as independent units and generally source from within the host country. The second factor is the availability of low cost land and labour,

[6] Figure 1 is replicated from Gollnhofer and Turkina (2015).

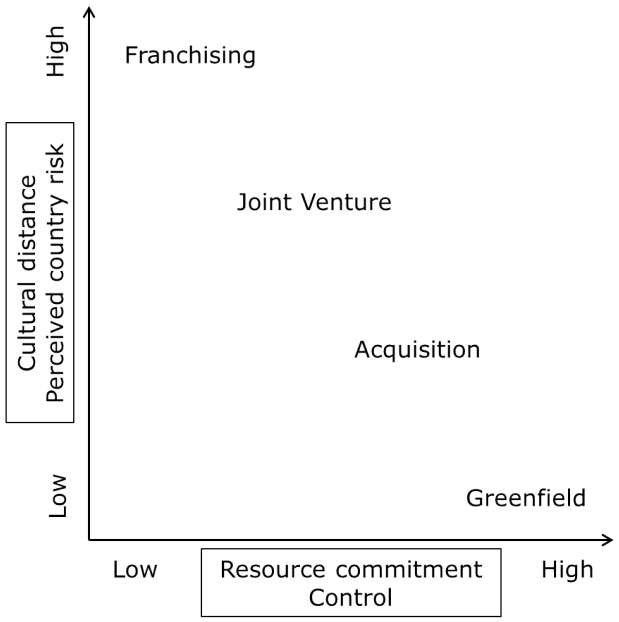

Figure 1: Cultural distance and entry modes in foreign markets

which is more important for mass retailers than for niche retailers.

Park and Sternquist (2008) argue that market differences due to cultural and geographic factors are less relevant for global retailers, because their global strategies and definitions of the segment of their customers with similar lifestyles in each country ignore national or regional differences. Location-specific advantages relevant for them are more related to competitors' moves, because pioneering advantages may be lost if competitors preempt a foreign market. Thus, being a pioneer of a certain type of retailing to a specific segment of customers is a decisive location-specific advantage for global retailers. Combing this kind of location-specific advantage with the ownership advantages of global retailers, the authors propose, that pioneering advantages are more likely to arise for global retailers with a unique concept than for global retailers with a unique capability. The more their ownership advantages are resulting from unique concepts, the more likely they expand rapidly. Vice versa, if their ownership advantages are more resulting from unique capabilities, the less likely they perceive a need for rapid expansion.

Internalisation advantages play a decisive role in explaining the choice of FDI as the entry mode to a foreign market. Ownership advantages in retail trade are often innovation advantages, but the public good character of the retailing innovations leads to a appropriability problem, since there are no legal ways to defend them from imitators (Pellegrini, 1991; Sternquist, 1997). Therefore, franchising might be a dangerous idea for retailers with ownership advantages based

on organisational innovations, because licensing or franchising such a innovation requires negotiations including the disclosure of information which facilitates imitation. Thus, to maintain such an ownership advantage and to protect its operating secrets, a retail firm needs to internalize its innovation by choosing wholly owned subsidiaries as its entry mode into a foreign market. Joint ventures also offer less protection of secrets than wholly owned subsidiaries, but are often necessary when entering into a foreign market with a different cultural environment, or because of government regulations (Sternquist, 1997). Another aspect is that organisational innovations are often the result of learning by doing and learning to learn, which are, in turn associated with learning costs. These costs can play both a positive and negative role with regard to FDI as the preferred entry mode into a foreign market (Pellegrini, 1991). On the one hand, these costs are an incentive to FDI, because they imply some degree of internalisation. On the other hand, if a given retail concept has to be adapted substantially to be transferred to different markets, the costs of these adaptations could be too high to justify FDI. Thus, the necessary localised learning is an important factor to explain joint ventures with local partners in mass retailing, where adaptation costs with regard to sourcing and assortment composition can be very high.

In the OLI approach, the different entry modes into a foreign market are considered as substitutes. An internationalising firm chooses depending on the composition of its advantages one of the available entry modes. In the case of retail trade services, FDI replaces the exports that are not possible because of the necessary simultaneous presence of the supplier and the consumer, the so-called coterminality (Blind and Jungmittag, 2004). However, there can be also a complementary relationship between exports and FDI. An important case is that a rather large fraction of affiliates owned by multinational manufacturing firms operate in the wholesale or retail trade sector.[7] Krautheim (2013) proposes a model that combines trade, horizontal FDI and export-supporting FDI. The latter reduces distribution costs abroad for manufacturing firms, while their production firms remains at home. Thus, export-supporting foreign affiliates belonging to the wholesale or retail trade sector introduce a complementarity between trade and FDI, while trade and production abroad remain substitutes.

2.2 The Knowledge-Capital Model

Some more recent theoretical contributions try to incorporate endogenous multinational firms into general-equilibrium trade models. One of these approaches is the "knowledge-capital model" of Markusen (1997, 2002), Carr et al. (2001) as well as

[7] In this case both FDI statistics as well as foreign affiliate sales and employment statistics tend to overstate the importance of services (UNCTAD, 2017; Andrenelli et al., 2018).

Markusen and Maskus (2002), which assumes that knowledge is geographically mobile and a joint input to multiple production facilities. This model is based on three principal assumptions (Carr et al., 2001). First, services of knowledge-based and knowledge-generating activities can be geographically separated from production and supplied to production facilities at low cost. Second, these knowledge-intensive activities are skilled-labour intensive relative to the final production. Third, the services of these knowledge-based assets have at least partially the character of joint ("public") inputs into geographically separate production facilities. The first two assumptions create a motive for the vertical fragmentation of production, locating the headquarters and knowledge-generating activities in a country where skilled labour is cheap, while production might be located in another country where unskilled labour is cheap (Markusen and Maskus, 2002). There is also a market-size motive for locating production if there are plant-level scale economies. The third assumption creates firm-level scale economies and motivates horizontal investments that replicate the same products or services in different locations (Carr et al., 2001).

Generally, according to the knowledge-capital model, multinational enterprises can exist both when countries are similar (horizontal FDI) or different (vertical FDI) in relative factor endowments, particularly if the skilled-labour-abundant country is small. In the latter case, the headquarters and knowledge-generating activities would be located in the skilled-labour-abundant country, but the plant would exist in the large, skilled-labour-scarce country to take advantage of both, the factor-price differences and the large market size (Markusen and Maskus, 2002).

With regard to the analysis of trade and FDI in services, Markusen and Strand (2009) argue that no particularly new theory is needed, because an adaptation of the knowledge-capital model will do well. One important reason, why an adaptation is required, are the restrictions that impede trade and FDI in services and thus raise costs to potential service providers, which are generally rather different from those that hamper trade in goods and have different effects on service providers' decisions to enter a foreign market via a certain mode (cross-border trade or establishing a commercial presence). Particularly relevant restrictions to trade and FDI in services are 'policy-imposed' barriers or costs, which include regulations that target at both domestic and foreign firms as well as barriers to establishment that restrict foreign supply of services due to high costs of establishing a commercial presence or govern the entry mode for foreign service suppliers. However, after this general remarks, Markusen and Strand (2009) concentrate on business services to adapt the knowledge-capital model to the analysis of trade and FDI in services.

Chellaraj and Mattoo (2015) analyses more generally whether the knowledge-capital model can explain FDI in services. Given that the assumptions of this

model generate incentives for firms to fragment production into vertical phases, the authors conclude for internationalising retail trade firms that they will locate marketing research where is a plenty of skilled labour, while stores for selling products are located close to customers. Horizontal FDI, which is the prevailing type of FDI in the retail trade sector, becomes more important if countries are similar in size and relative factor endowments, transport costs are high and investment costs are low. In this environment service firms should prefer to place production capacities of services in both locations, taking advantage of firm-level economies of scale, while selling primarily in local or regional markets to avoid transport costs. Knowledge-generating activities, as market research in the case of retail trade firms, may be carried out in two skilled-labour-abundant countries located in those two regions in order to sell products primarily in the local or regional market. The situation changes if countries vary in size and relative factor endowments. Then, multinational service firms would concentrate headquarters in the skilled-labour-abundant country and production of services in the skilled-labour-scarce country. Such vertical FDI is particularly likely if one country is small and skilled-labour abundant. Thus, similar to manufacturing firms, a retail trade firm originating from a small skilled-labour-abundant country will locate its headquarters in that country to undertake knowledge-generating activities as complex market research, while it will locate stores for selling products in the labour abundant location (Chellaraj and Mattoo, 2015).

2.3 The Proximity-Concentration Hypothesis and Firm Heterogeneity

Since the second half of the nineties, there is furthermore a growing literature about the decision between exports and FDI that assumes a trade-off between achieving a proximity to consumers and the concentration of production in order to realise economies of scale (Brainard, 1997).[8] This proximity-concentration hypothesis predicts that is the more likely that FDI is chosen as measure of internationalisation the higher are transport costs and trade barriers and the lower are investment barriers and the ratio of scale economies at the plant level relative to the corporate level.

Brainard (1997) models this trade-off in an approach with two factors, two countries and two sectors. One sector produces a homogeneous good using a technology with constant returns to scale, while the other sector produces differentiated goods using a technology with increasing returns to scale. On the one hand, there are economies of scale at the firm level, e.g. due to R&D whose results can be passed

[8] The origins of the proximity-concentration hypothesis already can be found in Krugman (1983), Horstmann and Markusen (1992) and Brainard (1993).

to any number of plants without any obsolescence. Such activities cause fixed costs at the firm level. On the other hand, there are also fixed costs at each plant of a firm, such that concentrating production lowers unit costs and allows to realise economies of scale at the plant level. Furthermore, exports are associated with unit costs due to transport costs and trade barriers, which increase with distance. Using a set of simplifying assumptions and supposing that the market structure in the differentiated-goods sector is characterised by Chamberlinian monopolistic competition, three equilibria arise.

First, a pure multinational equilibrium with all firms having plants in both countries is the more likely the higher are the transport costs and trade barriers and the lower the fixed costs at the plant level relative to these costs at the firm level. Multinational production completely substitutes foreign trade with final goods and there is only trade in intra-firm services. Furthermore, there are mutual multinational activities in the same sector. Secondly, under reverse conditions, the result is a pure trade equilibrium with all firms having a single plant located in the same country as their headquarters. Now, there is mutual trade with differentiated goods, and, if factor proportions are equal, all trade is intra-industry. Thirdly, there exists a mixed equilibrium, if the parameter values are between those of the pure equilibria. In this equilibrium, multinational firms and firms with only one production plant in a single country coexist in each country. The share of exporting firms is larger the higher the fixed costs at the plant level, the lower the transport costs and trade barriers and the smaller the markets. There is mutual trade in final goods as well as mutual multinational production (Brainard, 1997).

Helpman et al. (2004) take up the proximity-concentration hypothesis and analyse the trade-off between FDI and exports in a model with many countries and sectors, in which heterogeneous firms according to the model of Melitz (2003) are active. Melitz (2003) assumes that there is a competitive fringe of potential firms that can enter an industry by paying a fixed entry cost, which is then sunk.[9] Potential entrants face ex ante uncertainty with regard to their productivity. After having paid the sunk entry cost, firms draw their productivity from a common distribution, and these productivities remain fixed thereafter. Furthermore, firms produce horizontally differentiated goods within the industry under conditions of monopolistic competition. The existence of fixed production cost entails that firms having drawn a productivity level below the zero-profit productivity cut-off exit the industry. Fixed and variable costs of exporting assure that only those firms having drawn a productivity about a higher export productivity cut-off find it profitable to export.

[9]The following short description of the approach of Melitz (2003) closely follows Bernard et al. (2012).

Already the initial Melitz (2003) model provides some conclusions with regard to the impact of a symmetric reduction of trade barriers between all countries on the industry equilibrium (Bernard et al., 2012). High productivity exporting firms increase their revenues through larger export market sales. Additionally, the most productive non-exporters now find it profitable to enter export markets, thereby rising the fraction of exporting firms. On the other hand, firms with low productivity exit and revenues of firms that only serve the domestic market decrease.

In their combination of the proximity–concentration model of Brainard (1993, 1997) and the heterogeneity model of Melitz (2003), Helpman et al. (2004) assume that many sectors in each of many countries produce differentiated goods and one further sector in each country produces a homogeneous good. Heterogeneity within the sectors is generated according to the Melitz (2003) model via firm-specific productivities. The trade-off between proximity and concentration is modelled by assuming that the entry modes to serve a foreign market are associated with different relative costs. Exports lead to lower fixed costs, while FDI causes lower lower variable costs. On the other hand, compared to exports, serving a foreign market via FDI saves transport costs, but duplicates the production plants and thus increases fixed costs. In the equilibrium, no firm uses both entry modes to a foreign market.

According to their productivity levels, four groups of firms can be distinguished. The least productive firms expect negative profits and leave the industry. The firms with the second lowest productivity levels expect profits from sales in the domestic market, but losses from sales via exports or FDI, so that they only supply the domestic market. Firms in the subsequent layer of productivity levels are able to export with profits. Only firms in the highest layer of productivity levels will undertake FDI, because they will realise higher profits by serving a foreign market via a subsidiary than by exporting.

The model of Helpman et al. (2004) shows furthermore that larger countries attract disproportionately many market entries. Additionally, the market share of domestic firms is larger in larger markets. The ratio of exports to sales of foreign subsidiaries is lower in industries with higher transport costs or country-specific fixed costs, although the latter also must be paid by multinational affiliates. The relative exports are also lower in industries with low economies of scale at the plant level. Moreover, industries with a larger dispersion of domestic sales of the individual firms, resulting either from a larger dispersion of firm-specific productivities or a higher elasticity of substitution, have lower relative export sales.

There are several attempts to change the focus of the Helpman et al. (2004) model from the global structure of production of goods to the decision of exports

versus FDI in services. Bhattacharya et al. (2012) place emphasis on certain IT-oriented services where telecommunication networks reduce transport costs to near-zero. Thus, there is little incentive to pay the fixed costs of FDI, since foreign customers can be served by producing at home. However, this prediction of no FDI in such IT-oriented services is clearly at odd with the empirical evidence. To explain this situation, the authors introduce an unique feature of services into the Helpman et al. (2004) model. When there is a considerable distance between the producer and consumer of services, the latter faces risk of the service quality. Under such conditions, low-productivity firms find it efficient to pay the fixed costs of FDI, while high-productivity firms can obtain the highest profits by both exporting and investing abroad. Thus, assuming high risk but zero transport costs, their modified model predicts a reversal of the productivity ordering of the original model.

Oldenski (2012) argues that traditional proximity-concentration models overemphasise physical transport costs and market size while they underemphasise the costs of transmitting information. Particularly, the trade in knowledge-based services requires to pay greater attention to the transmission of information when studying the production location decisions of firms. Thus, she augments the traditional models with the relative importance of interacting with customers and communicating complex information within firms, which determines whether a firm serve a foreign market through exports or affiliate sales. Consequentially, goods and services requiring direct communication with consumers are more likely to be produced in the foreign country, while activities requiring complex communication within the firm are more likely to be located at the firm's headquarters for export.

Castellacci (2014) introduces service innovations in the Helpman et al. (2014) model and shows that innovations have two distinct (indirect) effects on service firms' choice between exports and FDI. First, innovations tend to enhance service firms' productivity, thus making it easier for innovative firms to pay the fixed costs of FDI. Secondly, innovation makes export activities more risky and costly, due to the existence of relational distance costs that exporting firms must sustain in order to commercialise their new services overseas. This is a particularly important for firms in the service sectors due to the great relevance of user-producer interactions and the related importance of physical and cultural proximity. For both reasons, service innovations shift the trade-off between trade and FDI towards the latter, i.e. the FDI entry mode becomes relatively more convenient for innovative firms versus the entry into foreign markets through exports.

Yeaple (2009) extends the original model of Helpman et al. (2004) and shows that the sorting of firms according to their productivity can be extended to the scope and scale of multinationals. It can be expected that more productive parent

firms operate in more foreign markets and at a higher scale in terms of the average sales of their subsidiaries.[10]

At the industry or aggregate level, exports X_{ij} to country i from country j can be decomposed into the extensive margin of the number of exporting firms M_{ij} and the intensive margin of the average exports of a exporting firm (X_{ij}/M_{ij}):

$$X_{ij} = M_{ij}\left(\frac{X_{ij}}{M_{ij}}\right).^{11} \tag{1}$$

Chaney (2008) shows in a setting with heterogeneity of firms, that changes in variable trade costs and fixed trade costs (total trade barriers are higher than variable trade costs) can affect both the extensive and intensive margin of exports. Obviously, in models with firm heterogeneity à la Melitz (2003), an increase in variable trade costs has two offsetting effects on the intensive margin (Bernard et al., 2012). On the one hand, higher variable trade costs reduce average firm exports. On the other hand, higher variable trade costs forces some firms to exit the export market, because they no longer generate sufficient profit to cover the fixed costs of exporting. As these exiting exporters have smaller export values than the remaining exporters, the average firm exports generally rise through a change in the composition of exporters.

For changes in fixed trade costs, Chaney (2008) demonstrates that the elasticity of substitution between differentiated products has no impact on the intensive margin when fixed costs move, whereas it dampens the impact on the extensive margin. In a nutshell, he proves that the extensive margin, the number of exporters, and intensive margin, the exports per firm, are affected by the elasticity of substitution in exact opposite directions. In sectors with a low elasticity of substitution, the extensive margin is highly sensitive to trade barriers, compared to the intensive margin, and the reverse holds true in sectors with a high elasticity. Thereby, the extensive margin always dominates.

Needless to say, the sales of firms (S_{ij} in country i controlled by country j can also be decomposed into the extensive margin of the number of foreign firms N_{ij} and the intensive margin of the average sales of a foreign controlled firm (S_{ij}/N_{ij}):

$$S_{ij} = N_{ij}\left(\frac{S_{ij}}{N_{ij}}\right). \tag{2}$$

[10] Empirical evidence for these effects for US multinationals is also provided by Yeaple (2009), for European multinationals e.g. by Chen and Moore (2010), Fariñas et al. (2018) and Mainer-Casado (2018).

[11] This definition follows Bernard et al. (2012), while Chaney (2008) defines the intensive margin as the change of the size of the exports of each existing exporter, and his extensive margin is defined by how much new entrants export (in the case of a reduction in trade barriers).

This differentiation between the extensive and intensive margin of the sales of foreign controlled firms serves as starting point for the specification of the econometric models used to explain the extent of the internationalisation of retail trade services through foreign affiliates. Furthermore, the review of the recent theoretical literature provides numerous hints for the choice of potentially relevant explanatory variables.

3. Empirical Methodology and Data

Multinational firms have to make two-fold decisions with regard to their FDI activities. First, they have to decide whether to invest at all and to set up a foreign controlled firm in a certain country, and, secondly, how much to invest and how many people to employ in the chosen host country. The latter decision has a strong impact on the sales of the foreign controlled firm. At the sector or aggregate level, the first decision determines the extensive margin of employment and sales of foreign controlled firms, namely the number of foreign controlled firms. The heterogeneous firm model discussed in the previous section shows that a productivity threshold determines a firm's ability to set-up foreign affiliates. This threshold gives rise to zero values in the number of firms controlled by country i in country j, and, consequently, in the employment and sales data for these firms (Garrett, 2016). However, there also may be further reasons, why not all country pairs have reciprocal FDI relationships between each other. The second decision of the multinational firms determines the intensive margin of the activities of the foreign controlled firms, namely average employment and average sales per firm.

In the following, I discuss the specification of the empirical gravity-type models for the extensive and intensive margin of the activities of foreign controlled retail trade firms. Afterwards, the data used to estimate these models are presented.

3.1 The Model for the Extensive Margin

The dependent variable in the model for the extensive margin of the activities of foreign controlled retail trade firms – the number of such firms N_{ij} in country i controlled by country j – is a count variable. A common starting point for modelling count data is the Poisson regression model. However, my sample of foreign controlled retail trade firms count data has a sample variance much greater than the sample mean, suggesting a model that incorporates this over-dispersion is better suited for these counts. The negative binomial regression model, which arises from a natural extension of the Poisson regression, is a popular choice for over-dispersed count data in the applied literature (e.g. Blonigen and Piper, 2014). Although the over-dispersion is already large for the counts of foreign controlled

firms greater than 0, it further increases, when the zero values (44% of the counts in 2014 and 41% in 2015) are included (Table 1 and Figure 2). Therefore, it is appropriate to choose a model that incorporate both over-dispersion and excess zeros, either a hurdle model or a zero-inflated model.

Hurdle models, originally proposed by Mullahy (1986) in the econometrics literature are two component models (Zeileis et al., 2008). They comprise a truncated count component, in this case a negative binomial part, which is employed for positive counts, and a hurdle component (e.g. a probit part), which models zero versus larger counts. Zero-inflated models are an extension of the hurdle in with the zero count can arise from one of two regimes (Greene, 2012). In one regime, the count is always zero, in other, a usual count process (e.g. Poisson or negative binomial) works, which can produce a zero count or some other. This model is two-component mixture model and a binary model (e.g. a probit model) is used to model the unobserved state: zero versus count (Zeileis, 2008).

In order to make an appropriate choice between the two models, the use of knowledge about the economic background and economic theory can be very helpful. The hurdle model can be viewed as a latent variable model (Greene, 2012; Faraway, 2016). In our case, this latent variable might measure the propensity of a country j to control retail trade firms in country i, and there is a hurdle which this latent variable must exceed for a foreign controlled firm to be set up. If the latent variable is less than the hurdle, no foreign affiliate occurs, but as it exceeds the hurdle, more firms from country j control retail trade firms in country i. The heterogeneous firm model with its sorting of firms according to productivities and fixed costs for FDI provides a good argument for the use of such a hurdle model. The zero-inflated model can also be viewed as latent variable model, but there a two types of zeros from different regimes. One type of zeros reflects countries j that never control retail trade firms in country i, while the other type of zeros reflect countries j that do not controlled a retail trade firm in country i in the current year of observation, but controlled firms in near past or may control firms in the near future.[12]

Since FDI and the set-up of foreign controlled firms are long-term strategic decisions associated with high fixed costs, such an interpretation of the zero counts is less appropriate than the interpretation in the hurdle model. Philippides et al. (2013) argue that the zeros from the first regime ("never any FDI") could also be due to data collection errors, which makes the zero-inflated model more appropriate. However, in my analysis I excluded all not available values, because they are in most cases non-zero and unpublished for reasons of confidentiality. Thus, my data include only "true" zeros as a corner solution of the (observable) choice of a variable. Therefore, I decided to use the hurdle negative binomial specification to model the extensive margin of foreign controlled retail trade activities.

[12] Philippidis et al. (2013) provides a similar interpretation for export activities.

The first part of the hurdle model is a binary probability model that determines whether a zero or non-zero count of foreign controlled firms occurs. Using a probit participation equation, this zero hurdle model part can be written as

$$P(s_{ij} = 1) = \Phi\left(\alpha_1 + \alpha_j + \beta_1 X_{1ij} + \beta_2 X_{2i}\right), \tag{3}$$

where $s_{ij} = 1$ if the count of firms in country i controlled by country j is $N_{ij} > 0$, and zero if $N_{ij} = 0$. $\Phi(\bullet)$ is the standard normal distribution function. α_1 is the constant term, α_j are the origin country fixed effects, X_{1ij} are bilateral explanatory variables and X_{2i} are host country specific explanatory variables. β_1 and β_2 are the regression coefficients belonging to these variables. Ideally, a gravity model should include, besides bilateral explanatory variables, origin country and host country fixed effects in order to capture multilateral resistance (Anderson and van Wincoop, 2003). However, since the purpose of this analysis is to estimate the impact of host countries' service trade restrictions, this approach is not feasible. Host country fixed effects would absorb the effects of the service trade restrictions and all other host country specific variables and impede disentangling the effects of these variables.[13] Based on the explanatory variables, this first part estimates the probability that there is at least one retail trade firm in country i controlled by country j.

The second part of the hurdle model is a truncated count data model that describes the positive outcomes. Expressing the first part as $f_{\text{zero}}(N_{ij} = 0) = 1 - P(s_{ij} = 1)$, than the general specification of the second part is (Zeileis et a., 2008; Faraway, 2016):

$$P(N_{ij} = n_{ij}) = \frac{1 - f_{\text{zero}}(0)}{1 - f_{\text{count}}(0)} f_{\text{count}}(n_{ij}), \; n_{ij} > 0. \tag{4}$$

I use a negative binomial distribution for f_{count}, but this now describes a truncated binomial distribution, as zero is not an admissible outcome and the distribution must be rescaled appropriately.

Assuming that the mean μ_{ij} of the negative binomial distribution of N_{ij} varies systematically with the same kind of independent variable as the zero hurdle part of the model, the value μ_{ij} is placed, as customary, within a loglinear model (Saffari et al. (2012):

$$\mu_{ij} = e^{\alpha_1 + \alpha_j + \beta_1 X_{1ij} + \beta_2 X_{2i}}.^{14} \tag{5}$$

[13] Nordas and Rouzet (2017) argue in a similar way in their analysis of the impact of service trade restrictions on trade flows.

[14] The two parts of the hurdle model have not to include the same explanatory variables

Thus, the concrete specification of the second part of the hurdle model is:

$$P(N_{ij} = n_{ij}) = \Phi\left(\alpha_1 + \alpha_j + \beta_1 X_{1ij} + \beta_2 X_{2i}\right) \frac{\Gamma(n_{ij} + \theta^{-1})}{\Gamma(n_{ij} + 1)\Gamma(\theta^{-1})} \tag{6}$$
$$\times \frac{\left(1 + \theta e^{\alpha_1 + \alpha_j + \beta_1 X_{1ij} + \beta_2 X_{2i}}\right)^{-\theta^{-1} - n_{ij}} \theta^{n_{ij}} \left(\alpha_1 + \alpha_j + \beta_1 X_{1ij} + \beta_2 X_{2i}\right)^{n_{ij}}}{1 - \left(1 + \theta e^{\alpha_1 + \alpha_j + \beta_1 X_{1ij} + \beta_2 X_{2i}}\right)^{-\theta^{-1}}}, \; n_{ij} > 0,$$

where $\Gamma(\bullet)$ is the gamma function and $\alpha(\geq 0)$ is a dispersion parameter.

Several variants of this hurdle model for the extensive margin of retail trade FDI activities are estimated using the pscl package in R.

3.2 The Model for the Intensive Margin

The intensive margin of retail trade FDI activities is analysed with regard to average employment and sales of retail trade firms in i controlled by country j. Average employment is defined as total number of employees of retail trade firms in i controlled by country j divided by the number of these firms (L_{ij}/n_{ij}). Average sales are calculated analogously as S_{ij}/n_{ij}. Taking average employment as an example, the gravity-type estimation equation is specified as

$$\ln\left(\frac{L_{ij}}{n_{ij}}\right) = \alpha_1 + \alpha_j + \beta_1 X_{1ij} + \beta_2 X_{2i} + \varepsilon_{ij}. \tag{7}$$

The types of explanatory variables on the right side of this equation are defined in the same way as for the model for the extensive margin. Additionally, ε_{ij} is an error term. The models for the intensive margin are estimated by OLS.

3.3 Data and Descriptive Statistics

The models are estimated for two cross sections of observations in the years 2014 and 2015. Although a panel data approach over a larger timespan would be desirable, there is only for these two years an overlap between the counts, employment and sales of foreign controlled firms in the Eurostat FATS database and the service trade restrictiveness indicators of the OECD. Yearly data from the former database is available until 2015, while yearly data from the latter database is available from 2014 to 2017.

The data for the dependent variables for the years 2014 and 2015 are taken from Eurostat's Foreign Affiliate Statistics (FATS) database. These are the number, employees and sales of retail trade (except of motor vehicles and motorcycles) firms in the 28 EU host countries controlled by 42 source countries (the 28 EU countries

and 14 other countries).[15] I exclude all missing country-pair observations from the analysis with consist of either unreported or confidential data. Omitting also those observations where one of the relevant explanatory variable (especially the service trade restrictiveness indicators (STRI) for five EU countries) is missing leads to 820 country pairs in 2014 and 836 country pairs in 2015 for the number of retail trade firms in country i controlled by country j (see Figure 2 and Table 1 for some descriptive statistics).[16] There are 358 "true" zero counts for the number of firms in 2014 and 346 "true" zero counts in 2015. Looking at the positive counts of firms, it is obvious that for the majority of country pairs the number of foreign controlled retail trade firms is rather small. The median is in both years six firms.

Average employment as the intensive margin of retail trade FDI activities is available for 255 country pairs in 2014 and 257 country pairs in 2015. For average sales as the second measure of the intensive margin of these activities there are 217 country pairs available in 2014 and 239 country pairs in 2015.[17]

The explanatory variables in the analysis, besides the service trade restrictiveness indicators as the main variables of interest, are, on the one hand, some standard variables of the gravity model, and, on the other hand, variables suggested by the review of the theoretical literature in section 2. Generally, there are two types of explanatory variables, on the one hand, bilateral variables, and, on the other hand, host country specific variables.

Two typical bilateral gravity model variables are geographic distance and a dummy variable for common borders of a country pair. For this analysis these two variables are taken from the GeoDist database of CEPII.[18] Besides geographical distance, cultural distance also is discussed as an important factor with an expected negative influence on retail trade FDI activities. E.g., the adaptation of the OLI approach to retail trade internationalisation considers cultural proximity as an important pull factor for the suitability of a foreign market (see Section 2.1). Following previous research, we measure the cultural distance between the source and host countries by the Kogut and Singh (1988) index, which is in this analysis based on the differences in scores on each of Hofstede's (2011) six dimensions of

[15] These are all countries available at the sector level in the FATS database. The 14 other countries are Australia, Canada, China (except Hong Kong), Hong Kong, Iceland, Israel, Japan, Liechtenstein, New Zealand, Norway, Russia, Switzerland, Turkey and the United States.

[16] The STRI are not available for Bulgaria, Croatia, Cyprus, Malta and Romania.

[17] Since logs of these variables are used in the estimations, the observations for average employment reduce to 251 in 2014, and the observations for average sales to 213 in 2014 and 238 in 2015.

[18] Other typical gravity model variables like a common language and former colonial ties were also included in some estimations, but they show no statistical significance at the usual levels, neither in the equations for the extensive margin nor in the equations for the intensive margin of retail trade FDI activities. Thus, I do not report these results.

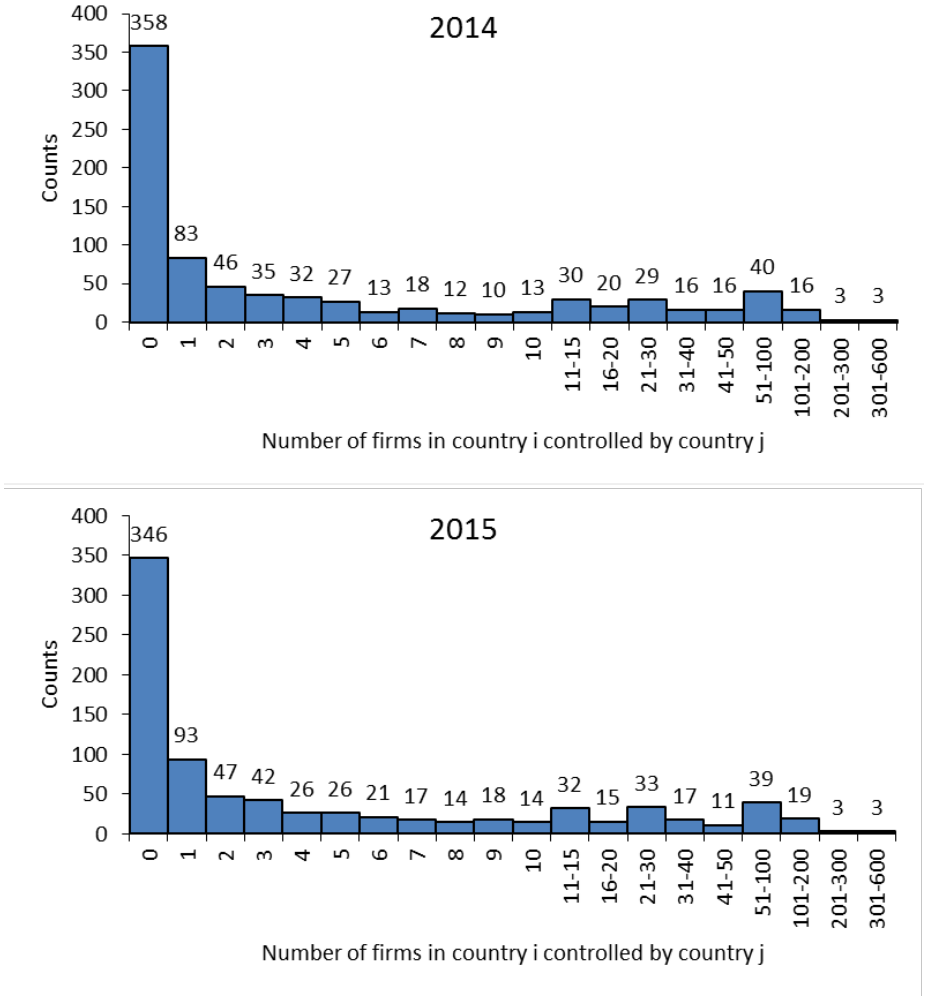

Figure 2: Distribution of the number of foreign controlled retail trade firms

national culture. This index CD_{ij} is calculated as

$$CD_{ij} = \frac{1}{6} \sum_{c=1}^{6} \frac{(C_{ci} - C_{cj})^2}{V_c}, \tag{8}$$

where C_{ci} represents country i's score of Hofstede's cth cultural dimension and V_c the variance of this dimension across all available countries. Although the Kogut–Singh index has been criticized (Shenkar, 2001), we use this index to keep our dataset comparable to other studies.[19]

Horizontal FDI is the prevailing type of FDI in the retail trade sector, and, according to the knowledge-capital model, becomes more important when countries

[19] A similar argument can be found in Linders et al. (2005) or Zwinkels and Beugelsdijk (2010).

Table 1: Descriptive statistics

Variable	Year	Nobs.	Mean	Median	Std. Dev.	Min.	Max.
			Bilateral variables				
Foreign controlled firms (number)	2014	820	13.101	1	38.854	0	596
	2015	836	13.360	1	38.352	0	516
Foreign controlled firms (number > 0)	2014	462	23.253	6	49.451	1	596
	2015	490	22.794	6	47.918	1	516
Average employment (number)	2014	255	196.89	77.500	413.44	0	5091.4
	2015	257	190.46	69.212	382.25	0.333	4078.5
Average sales (millions Euro)	2014	217	34.660	13.833	67.899	0	581.48
	2015	239	37.002	12.650	68.841	0	621.85
Common border (dummy)	–	820	0.088	0	0.283	0	1
	–	836	0.084	0	0.277	0	1
Geographic distance (km)	–	820	2959.2	1553.9	3900.6	59.617	19586
	–	836	2993.0	1545.8	3943.6	59.617	19586
Cultural distance (index)	–	820	1.938	1.691	1.222	0.016	7.591
	–	836	1.960	1.725	1.226	0.016	7.591
Factor dissimilarity (index)	2014	820	0.738	0.683	0.540	0.001	2.889
	2015	836	0.743	0.670	0.540	0.001	2.835
Size similarity (index)	2014	820	−1.709	−1.358	1.053	−5.869	−0.693
	2015	836	−1.705	−1.363	1.056	−5.880	−0.693
			Host country specific variables				
GDP (billions Euro)	2014	23	565.55	190.04	774.14	17.321	2752.9
	2015	23	578.48	238.64	786.08	17.616	2801.9
Labour costs per hour (Euro)	2014	23	21.471	22.918	11.930	6.158	39.693
	2015	23	21.912	25.235	11.948	6.258	39.714
Service trade restrictiveness (index)	2014	23	0.156	0.144	0.043	0.090	0.246
	2015	23	0.157	0.144	0.043	0.090	0.246
Foreign entry (index)	2014	23	0.057	0.055	0.021	0.027	0.108
	2015	23	0.057	0.055	0.021	0.027	0.108
Movement of people (index)	2014	23	0.020	0.019	0.007	0.009	0.033
	2015	23	0.021	0.023	0.007	0.009	0.033
Oth. discriminatory measures (index)	2014	23	0.016	0.016	0.009	0	0.033
	2015	23	0.016	0.016	0.009	0	0.033
Barriers to competition (index)	2014	23	0.027	0.030	0.012	0.010	0.050
	2015	23	0.027	0.030	0.012	0.010	0.050
Regulatory transparency (index)	2014	23	0.036	0.036	0.012	0.018	0.064
	2015	23	0.036	0.036	0.012	0.018	0.064

are similar in relative factor endowments and size (see Section 2.2). Furthermore, an investor may find it easier to invest in a country with a similar size that could reflect more similarities with the home country (Fournier, 2015). Following Golub et al. (2003) and Fournier (2015), a factor dissimilarity index (FD_{ij}) is calculated as

$$FD_{ij} = \left| \ln\left(\frac{Y_i}{POP_i}\right) - \ln\left(\frac{Y_j}{POP_j}\right) \right|, \tag{9}$$

where Y is GDP, POP is population, and the dissimilarity in GDP per capita is used as a proxy for the dissimilarity in the capital stock per worker between country i and j.

Again following Golub et al. (2003) and Fournier (2015), size similarity (SS_{ij}) is approximated by

$$SS_{ij} = \ln\left(1 - \left(\frac{Y_i}{Y_i + Y_j}\right)^2 - \left(\frac{Y_j}{Y_i + Y_j}\right)^2\right). \tag{10}$$

The second group of explanatory variables are host country specific variables. The first important host country specific variable is market size as a typical gravity model variable. Market size is also considered as an important pull factor in the adaptation of the OLI approach to retail trade internationalisation and the Helpman et al. (2004) model predicts that larger countries attract disproportionately many market entries. As usual, real GDP (in Euro) of the host country is used as a proxy for its market size. The GDP data as well as population data (used to calculate the already mentioned factor dissimilarity indices) are taken from Eurostat.

A part of the OLI approach inspired retail trade literature mentions low cost labour in the host country as a further pull factor, which is more relevant for mass retailers than for niche retailers. Thus labour costs, measured as labour compensation per hour worked in the retail and wholesale trade sector, is also included as an explanatory variable. This data is taken from the EU KLEMS database.

The explanatory variable of particular interest in this analysis are restrictions to service trade, which are expected to have an negative impact on the FDI activities in the retail trade sector. From a theoretical point of view, mainly restrictions on foreign entry should impede FDI, but other restriction might also be relevant. The OECD service trade restrictiveness index (STRI) database contains information from more than 16,000 laws and regulations for 22 sectors in 44 countries (OECD, 2017) on a yearly basis starting in 2014. For each sector, this database covers five policy areas:

- restrictions on foreign entry (ENTRY),
- restrictions on movement of people (PEOPLE),
- other discriminatory measures (OTHER),
- barriers to competition (COMPET.),
- regulatory transparency (TRANS.).

The first three areas cover measures related to market access and national treatment, the fourth area comprises information on pro-competitive regulation (or lack thereof), and the fifth area provide information on transparency and administrative

procedures. For each policy area and sector, the qualitative information has been converted into quantitative indices, ranging from zero (absence of any regulation) to one (completely closed sector). Furthermore, a composite STRI has been calculated as a simple average of the sub-indices from the five policy areas. I use the five sub-indices and the composite STRI for the sector "distribution services" (covering wholesale and retail trade) for the years 2014 and 2015, which is the temporal overlap with the Eurostat FATS database. These indices are available for 23 EU host countries and remain for these countries nearly unchanged from 2014 to 2015.

The descriptive statistics for all used explanatory variables are also displayed in Table 1. All explanatory variables, with the exception of the dummy variables, enter the estimated models in logs.

4. Estimation Results

In this section, the estimation results for the determinants of the activities of foreign controlled EU countries' retail trade firms at the extensive and intensive margin are presented.

4.1 The Extensive Margin of Retail Trade FDI

The estimates of the hurdle models for the extensive margins of foreign controlled firms in 2014 and 2015 are presented in Table 2 and 3. The lower panels of these tables show the results for the zero hurdle model parts, while the upper panels display the count model parts. The first model (M0) contains the FDI gravity model variables, but not the STRI. For 2014 the zero hurdle model shows that geographic distance and wholesale and retail trade wages in the host country have a negative impact on the decision that at least one firm in country i is controlled by country j, while a common border and host country's GDP have a significant positive impact (see Table 2). Furthermore, cultural distance and factor dissimilarity seem to play no role for the hurdle decision that at least one retail trade firm in country i will be controlled by country j.

The count model part for 2014 shows that all included explanatory variables have at least at a 5% level a statistically significant impact on the number of retail trade firms in country i controlled j, if at least one such firm jumped over the zero hurdle (see the upper panel of Table 2). Thus, besides the positive impact of a common border, market size and size similarity and the negative impact of geographical distance and host country wages, also cultural distance and factor dissimilarity have a negative effect on the positive counts of foreign controlled retail trade firms. Furthermore, country fixed effects capture all observable and unobservable differences between source countries, including productivity differences

between the retail trade sectors of the controlling countries. In that respect, the empirical estimation also takes into account the theoretical argument of Helpman et al. (2004) at the sector level.

The results of model M0 are very similar for 2015, with the exception that the the effect of common border variable is no longer statistically significant different from zero. In the next step, the two explanatory variables with the lowest levels of significance (cultural distance and factor dissimilarity) are excluded in the zero hurdle model parts of the second model (M0r). The likelihood-ratio (LR) tests show that this restriction do not lead to a significant reduction of the explanatory power of the whole hurdle models for 2014 and 2015 (the last three rows of Table 2 and Table 3). Altogether, the explanatory variables derived from the review of the theoretical literature are well suited to estimate the benchmark models to explain the extensive margin for bilateral retail trade FDI activities.

The next six models include step-by-step the composite STRI for the distribution sector and the sub-indices for the five different policy areas. Each of these indices (except the movement of people in 2014) has a statistical significant negative impact in the zero hurdle model parts of the models M1 to M6 (see the lower panels in Table 2 and Table 3). Furthermore, the LR tests show that all STRI augmented models, with the exception of that with the movement of people indicator, outperform the restricted benchmark model (M0r) in both years. The largest improvement of the log likelihood value can be observed for model M1 with the composite STRI. Among the sub-indices, restrictions to foreign entry seem to have the largest individual negative impact to jump over the zero hurdle. This is not surprising as this sub-index includes information on foreign equity limitations, requirements that management or board of directors must be nationals or residents, foreign investment screening, restrictions on cross-border mergers and acquisitions, capital controls, regulations on cross-border data flows and a number of sector-specific measures (OECD, 2017). Thus, service trade restrictiveness obviously increases the hurdle that at least one retail trade firm in country i is controlled by country j, but they do not make the hurdle insurmountable, since there are seven countries that control retail trade firms in each of the 23 EU countries with available STRI data.[20]

However, the count model parts show that the STRI and most of the sub-indices exercise no statistically significant influence on the positive counts of foreign controlled retail trade firms. The only exception with a negative impact are restrictions on the movement of people in 2014 but not in 2015. Additionally, the sub-index for regulatory transparency shows an unexpected significant positive impact for both years (see the upper panels in Table 2 and Table 3).

[20]These countries are France, Germany, Netherlands, Sweden, Switzerland, the United Kingdom and the United States.

Table 2: Hurdle models for the numbers of foreign controlled firms in 2014

Variables	M0	M0r	M1	M2	M3	M4	M5	M6	M7
				Count model parts (negative binomial)					
Distance	−0.886***	−0.886***	−0.898***	−0.887***	−0.864***	−0.890***	−0.877***	−0.913***	−0.895***
	(0.140)	(0.140)	(0.141)	(0.141)	(0.138)	(0.140)	(0.140)	(0.140)	(0.136)
Culture	−0.406***	−0.406***	−0.404***	−0.406***	−0.399***	−0.400***	−0.408***	−0.420***	−0.415***
	(0.084)	(0.084)	(0.084)	(0.084)	(0.083)	(0.084)	(0.084)	(0.084)	(0.082)
Borders	1.098***	1.098***	1.088***	1.097***	1.078***	1.106***	1.106***	1.040***	0.983***
	(0.193)	(0.193)	(0.194)	(0.194)	(0.192)	(0.193)	(0.194)	(0.193)	(0.191)
Size sim.	0.132**	0.132**	0.121*	0.131*	0.138**	0.135**	0.145**	0.095	0.087
	(0.067)	(0.067)	(0.069)	(0.067)	(0.067)	(0.067)	(0.069)	(0.068)	(0.068)
Factor diss.	−0.325**	−0.325**	−0.333**	−0.326**	−0.325**	−0.315**	−0.319**	−0.361**	−0.375***
	(0.140)	(0.140)	(0.141)	(0.141)	(0.140)	(0.141)	(0.141)	(0.141)	(0.141)
Host GDP	0.365***	0.365***	0.372***	0.366***	0.345***	0.363***	0.345***	0.396***	0.379***
	(0.052)	(0.052)	(0.053)	(0.053)	(0.053)	(0.052)	(0.052)	(0.054)	(0.053)
Host wages	−0.824***	−0.824***	−0.851***	−0.824***	−0.701***	−0.793***	−0.798***	−0.893***	−0.738***
	(0.112)	(0.112)	(0.120)	(0.119)	(0.127)	(0.119)	(0.115)	(0.116)	(0.127)
STRI			0.149						
			(0.237)						
ENTRY				0.012					
				(0.161)					
PEOPLE					−0.349**				−0.534***
					(0.176)				(0.186)
OTHER						0.046			
						(0.062)			
COMPET.							−0.120		
							(0.147)		
TRANSP.								0.351**	0.498***
								(0.153)	(0.160)

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Variables	M0	M0r	M1	M2	M3	M4	M5	M6	M7
				Zero hurdle model parts (probit)					
Distance	−1.479***	−1.485***	−1.408***	−1.566***	−1.491***	−1.488***	−1.472***	−1.412***	−1.470***
	(0.183)	(0.181)	(0.188)	(0.189)	(0.182)	(0.185)	(0.182)	(0.183)	(0.193)
Culture	0.064								
	(0.095)								
Borders	0.891*	0.899**	1.224**	1.078**	0.890*	0.917*	0.923**	1.042**	1.183**
	(0.458)	(0.458)	(0.518)	(0.501)	(0.458)	(0.487)	(0.469)	(0.477)	(0.533)
Size sim.	0.068	0.075	0.216***	0.154**	0.075	0.078	0.128*	0.137*	0.190*
	(0.068)	(0.067)	(0.074)	(0.071)	(0.068)	(0.069)	(0.072)	(0.071)	(0.074)
Factor diss.	−0.136								
	(0.143)								
Host GDP	0.294***	0.294***	0.326***	0.279***	0.297***	0.295***	0.360***	0.312***	0.310***
	(0.055)	(0.054)	(0.057)	(0.056)	(0.055)	(0.055)	(0.062)	(0.056)	(0.059)
Host wages	−0.625***	−0.629***	−0.369***	−0.411***	−0.642***	−0.740***	−0.556***	−0.575***	−0.550***
	(0.115)	(0.113)	(0.124)	(0.122)	(0.122)	(0.120)	(0.118)	(0.116)	(0.131)
STRI			−1.838***						
			(0.274)						
ENTRY				−1.187***					−0.815***
				(0.177)					(0.197)
PEOPLE					0.052				
					(0.165)				
OTHER						−0.383***			−0.351***
						(0.074)			(0.082)
COMPET.							−0.369**		
							(0.158)		
TRANS.								−0.647***	−0.633***
								(0.167)	(0.196)
log L	−1820.9	−1821.4	−1796.2	−1797.0	−1819.4	−1807.5	−1818.3	−1811.1	−1778.9
LR tests H_0		M0 = M0r	M0r = M1	M0r = M2	M0r = M3	M0r = M4	M0r = M5	M0r = M6	M0r = M7
LR tests χ^2		1.09	50.39***	48.86***	4.06	27.85***	6.19**	20.54***	84.94***

Notes: Number of observations is 820 with 358 zeros for the dependent variable. All model parts include source country fixed effects. Standard errors in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table 3: Hurdle models for the numbers of foreign controlled firms in 2015

Variables	M0	M0r	M1	M2	M3	M4	M5	M6	M7
				Count model parts (negative binomial)					
Distance	−0.934***	−0.934***	−0.946***	−0.928***	−0.933***	−0.935***	−0.924***	−0.962***	−0.962***
	(0.135)	(0.135)	(0.136)	(0.136)	(0.135)	(0.135)	(0.136)	(0.135)	(0.135)
Culture	−0.403***	−0.403***	−0.401***	−0.406***	−0.404***	−0.399***	−0.404***	−0.420***	−0.420***
	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.080)	(0.079)	(0.078)	(0.078)
Borders	1.123***	1.123***	1.114***	1.127***	1.140***	1.129***	1.106***	1.054***	1.054***
	(0.190)	(0.190)	(0.190)	(0.190)	(0.191)	(0.190)	(0.194)	(0.189)	(0.189)
Size sim.	0.163***	0.163***	0.148**	0.166***	0.159**	0.165***	0.181***	0.121*	0.121*
	(0.063)	(0.063)	(0.064)	(0.063)	(0.063)	(0.063)	(0.065)	(0.063)	(0.063)
Factor diss.	−0.322**	−0.322**	−0.335**	−0.316**	−0.325**	−0.320**	−0.315**	−0.366***	−0.366***
	(0.139)	(0.139)	(0.139)	(0.139)	(0.139)	(0.139)	(0.139)	(0.139)	(0.139)
Host GDP	0.308***	0.308***	0.314***	0.304***	0.309***	0.307***	0.320***	0.331***	0.331***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.049)	(0.048)	(0.048)
Host wages	−0.719***	−0.719***	−0.751***	−0.701***	−0.735***	−0.701***	−0.688***	−0.784***	−0.784***
	(0.109)	(0.109)	(0.114)	(0.114)	(0.110)	(0.115)	(0.111)	(0.111)	(0.111)
STRI			0.225						
			(0.216)						
ENTRY				−0.079					
				(0.155)					
PEOPLE					0.116				
					(0.143)				
OTHER						0.030			
						(0.062)			
COMPET.							−0.154		
							(0.139)		
TRANSP.								0.437***	0.437***
								(0.144)	(0.144)

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Variables	M0	M0r	M1	M2	M3	M4	M5	M6	M7
					Zero hurdle model parts (probit)				
Distance	-1.527^{***}	-1.551^{***}	-1.537^{***}	-1.647^{***}	-1.538^{***}	-1.547^{***}	-1.544^{***}	-1.490^{***}	-1.570^{***}
	(0.183)	(0.180)	(0.191)	(0.191)	(0.182)	(0.182)	(0.183)	(0.184)	(0.193)
Culture	-0.007								
	(0.090)								
Borders	0.559	0.586	1.224^{**}	0.788^{*}	0.643	0.581	0.625	0.784^{*}	1.898^{*}
	(0.417)	(0.416)	(0.477)	(0.456)	(0.424)	(0.428)	(0.428)	(0.434)	(0.567)
Size sim.	0.025	0.029	0.228^{***}	0.128^{*}	0.044	0.027	0.125^{*}	0.134^{*}	0.185^{*}
	(0.066)	(0.066)	(0.076)	(0.071)	(0.067)	(0.067)	(0.072)	(0.071)	(0.074)
Factor diss.	-0.124								
	(0.141)								
Host GDP	0.351^{***}	0.358^{***}	0.414^{***}	0.348^{***}	0.349^{***}	0.352^{***}	0.471^{***}	0.399^{***}	0.388^{***}
	(0.053)	(0.052)	(0.058)	(0.055)	(0.052)	(0.053)	(0.061)	(0.055)	(0.058)
Host wages	-0.547^{***}	-0.557^{***}	-0.245^{***}	-0.318^{***}	-0.487^{***}	-0.627^{***}	-0.432^{***}	-0.468^{***}	-0.379^{***}
	(0.111)	(0.111)	(0.123)	(0.120)	(0.117)	(0.114)	(0.115)	(0.115)	(0.127)
STRI			-2.309^{***}						
			(0.277)						
ENTRY				-1.328^{***}					-0.978^{***}
				(0.178)					(0.196)
PEOPLE					-0.311^{*}				
					(0.167)				
OTHER						-0.249^{***}			-0.190^{**}
						(0.069)			(0.075)
COMPET.							-0.634^{***}		
							(0.156)		
TRANS.								-1.017^{***}	-0.850^{***}
								(0.172)	(0.195)
log L	-1898.2	-1898.7	-1857.7	-1867.4	-1896.6	-1892.0	-1889.5	-1875.7	-1778.9
LR tests H_0		M0 = M0r	M0r = M1	M0r = M2	M0r = M3	M0r = M4	M0r = M5	M0r = M6	M0r = M7
LR tests χ^2		0.89	82.08^{***}	62.49^{***}	4.11	13.40^{***}	18.35^{***}	46.00^{***}	84.94^{***}

Notes: Number of observations is 836 with 346 zeros for the dependent variable. All model parts include source country fixed effects. Standard errors in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

The last hurdle models (M7) for the extensive margin of retail trade FI activities include all those STRI sub-indices that remain statistically significant together with other sub-indices. For the zero hurdle part, these are for both years, 2014 and 2015, restrictions on foreign entry, other discriminatory measures and regulatory transparency, each with a statistically highly significant negative impact (see the lower panels in Table 2 and Table 3). In the count model part for 2014, the two sub-indices with a significant impact (restrictions on movement of people in model M3 and regulatory transparency in model M6) remain significant when both variables are included in model M7 (see the upper panel in Table 2). The only sub-index entering the count model part of model M7 for 2015 is regulatory transparency.

In a nutshell, the estimation results for the extensive margin of retail trade FDI activities show that service trade restrictiveness, especially restrictions on foreign entry, but also most of the measures from other policy areas, increases the hurdle that at least one firm from country j controls a retail trade firm in country i. Once one firm from country j has jumped over the hurdle in country i, service trade restrictiveness is not a relevant factor for the number of following firms from country j. Then, only the explanatory variables derived from the theoretical literature have a robust significant impact. Some case study evidence supports the findings from the estimation models. E.g., Khanna et al. (2009) study the concrete example of the German retail company Metro Group that fought for several years to have access to the Indian market. Once the foreign direct investment permit was granted, rival retail trade firms like Wal-Mart and Tesco entered immediately by benefiting from the created legal framework and the observed business opportunities in the Indian retail market. Furthermore, my findings are also in line with Helpman et al. (2008), who include bilateral entry regulation measures to estimate their first-stage Probit selection model for the choice of trading partners and select them as a valid excluded variable for their second-stage estimation of the trading volumes.

4.2 The Intensive Margin of Retail Trade FDI

In the following the estimation results for the determinants of the intensive margin of retail trade FDI activities are presented. This margin is measured, on the one hand, by average employment, and, on the other hand, by average sales of retail trade firms in country i controlled by country j. Table 4 shows the results for average employment of those firms in 2014. The second and third column display the benchmark models (M0 and M0r) without the service trade restrictiveness indicators. It is obvious that geographical and cultural distance no longer matter once the extensive margin of the engagement of firms of country j in the retail trade sector of country i has been chosen. The other gravity model variables are at least at a level of 5% statistically significant different from zero and show the

Table 4: OLS models for average employment of foreign controlled firms in 2014

Variables	M0	M0r	M1	M2	M3	M4	M5	M6
Distance	0.039							
	(0.177)							
Culture	0.020							
	(0.118)							
Borders	0.559**	0.517**	0.518**	0.517**	0.515**	0.512**	0.538***	0.517**
	(0.242)	(0.199)	(0.202)	(0.201)	(0.199)	(0.202)	(0.201)	(0.200)
Size sim.	0.202**	0.201**	0.228**	0.210**	0.201**	0.199**	0.228**	0.201**
	(0.098)	(0.097)	(0.094)	(0.071)	(0.097)	(0.096)	(0.095)	(0.096)
Factor diss.	−0.608***	−0.597***	−0.601***	−0.593***	−0.602***	−0.615***	−0.595***	−0.597***
	(0.219)	(0.210)	(0.209)	(0.210)	(0.214)	(0.211)	(0.209)	(0.209)
Host GDP	0.383***	0.383***	0.369***	0.378***	0.382***	0.386***	0.417***	0.383***
	(0.074)	(0.073)	(0.076)	(0.075)	(0.075)	(0.074)	(0.075)	(0.082)
Host wages	−0.600***	−0.600***	−0.528***	−0.559***	−0.585***	−0.651***	−0.546***	−0.601***
	(0.180)	(0.180)	(0.193)	(0.196)	(0.197)	(0.186)	(0.182)	(0.195)
STRI			−0.411					
			(0.334)					
ENTRY				−0.164				
				(0.232)				
PEOPLE					−0.058			
					(0.255)			
OTHER						−0.097		
						(0.084)		
COMPET.							−0.339*	
							(0.204)	
TRANS.								0.001
								(0.223)
log L	−368.7	−368.8	−367.7.7	−368.5	−368.7	−368.1	−367.0	−368.8
Adj. R^2	0.558	0.562	0.564	0.561	0.560	0.562	0.566	0.560

Notes: Number of observations: 251. All models include source country fixed effects. Heteroskedasticity-robust standard errors (HC1) in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table 5: OLS models for average employment of foreign controlled firms in 2015

Variables	M0	M0r	M1	M2	M3	M4	M5	M6
Distance	0.045							
	(0.176)							
Culture	0.025							
	(0.134)							
Borders	0.685***	0.633***	0.668***	0.643***	0.629***	0.633***	0.675***	0.636***
	(0.260)	(0.220)	(0.222)	(0.220)	(0.222)	(0.220)	(0.221)	(0.220)
Size sim.	0.096	0.095	0.124	0.101	0.106	0.095	0.115	0.107
	(0.104)	(0.104)	(0.102)	(0.103)	(0.105)	(0.104)	(0.103)	(0.105)
Factor diss.	−0.035	−0.025	−0.009	−0.020	−0.061	−0.021	−0.010	−0.005
	(0.229)	(0.228)	(0.227)	(0.229)	(0.218)	(0.228)	(0.228)	(0.226)
Host GDP	0.370***	0.370***	0.363***	0.368***	0.387***	0.370***	0.410***	0.358***
	(0.085)	(0.084)	(0.084)	(0.085)	(0.084)	(0.085)	(0.088)	(0.087)
Host wages	−0.473**	−0.478**	−0.399**	−0.448**	−0.407**	−0.463**	−0.430**	−0.439**
	(0.198)	(0.196)	(0.196)	(0.202)	(0.197)	(0.208)	(0.194)	(0.200)
STRI			−0.585*					
			(0.328)					
ENTRY				−0.148				
				(0.236)				
PEOPLE					−0.645***			
					(0.217)			
OTHER						0.023		
						(0.095)		
COMPET.							−0.342*	
							(0.205)	
TRANS.								−0.170
								(0.217)
log L	−397.5	−397.6	−395.6	−397.4	−392.3	−397.5	−396.0	−397.3
Adj. R^2	0.516	0.520	0.525	0.519	0.537	0.518	0.524	0.519

Notes: Number of observations: 257. All models include source country fixed effects. Heteroskedasticity-robust standard errors (HC1) in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

expected signs.

In the models M1 to M6, the STRI and its five sub-indices are added separately to the restricted benchmark model M1r. The composed STRI as well as most of the sub-indices have no significant impact on average employment of foreign controlled retail trade firms. The only exception are barriers to competition (COMPET.) in model M5, which seem to exercise a moderately significant negative influence on this measure of the intensive margin.

The estimation results for the determinants of average employment in 2015 are rather similar (see Table 5). The only difference for the usual gravity model variables is that size similarity and factor dissimilarity now has no longer a statistically significant impact. However, in order to ensure the comparability of the results for 2014 and 2015, they are included in the restricted benchmark model M0r and the models with the service trade restrictiveness indicators (M1 to M6). Again, barriers to competition in model M5 has a significant negative influence. Additionally, restrictions to the movement of people (PEOPLE) in model M3 show on the basis of the 2015 data a highly significant negative impact on average employment.

The estimation results for the determinants of the second measure for the intensive margin of retail trade FDI activities, average sales of foreign controlled firms, in 2014 and 2015 are displayed in Table 6 and Table 7. In both tables, the models M0 and M0r are the benchmark models without the service trade restrictiveness indicators. These models confirm that geographical and cultural distance also do not matter for average sales. As for average employment, factor dissimilarity has on average sales in 2014, but not in 2015. Differently, size similarity of the source and host country has now in both years a highly significant positive effect. Furthermore, compared to average employment, labour costs in the host country's distribution become less important. They are no longer statistically significant (at the usual levels) in 2014 and with a lower level in 2015. This might imply that foreign controlled retail firms in host countries with high labour costs use less labour intensive store formats to realise their sales.

For the 2014 data, there is no significant impact of the composed STRI or its five sub-indices on average sales of foreign controlled firms, while there is a significant negative effect of the restrictions on the movement of people in 2015. However, it would be irresponsible to draw any final conclusions with regard to the impact of this service trade restriction on the intensive margin of retail trade FDI activities. Rather, the appearance of the negative impact of restrictions on the movement of people on both average employment and average sales in 2015 seems to be a statistical artefact. The impact becomes negative in 2015, because there is a reduction of this indicator for two host countries (Czech Republic and Hungary) from 2014 to 2015, while all other 21 host countries do not experienced a change of

Table 6: OLS models for average sales of foreign controlled firms in 2014

Variables	M0	M0r	M1	M2	M3	M4	M5	M6
Distance	0.040							
	(0.168)							
Culture	−0.097							
	(0.133)							
Borders	0.512*	0.512**	0.495**	0.510**	0.508**	0.501**	0.508**	0.505**
	(0.274)	(0.239)	(0.240)	(0.241)	(0.239)	(0.240)	(0.238)	(0.241)
Size sim.	0.344**	0.339**	0.376**	0.343**	0.342**	0.336**	0.353**	0.362**
	(0.159)	(0.155)	(0.164)	(0.159)	(0.156)	(0.156)	(0.160)	(0.167)
Factor diss.	−0.497*	−0.526*	−0.527*	−0.524*	−0.535*	−0.535*	−0.526*	−0.516*
	(0.299)	(0.289)	(0.286)	(0.290)	(0.294)	(0.288)	(0.290)	(0.287)
Host GDP	0.306***	0.316***	0.289***	0.312***	0.308***	0.319***	0.326***	0.295***
	(0.106)	(0.102)	(0.109)	(0.107)	(0.107)	(0.105)	(0.101)	(0.115)
Host wages	−0.187	−0.194	−0.136	−0.184	−0.167	−0.220	−0.174	−0.163
	(0.209)	(0.207)	(0.220)	(0.224)	(0.216)	(0.213)	(0.210)	(0.220)
STRI			−0.348					
			(0.414)					
ENTRY				−0.042				
				(0.268)				
PEOPLE					−0.098			
					(0.283)			
OTHER						−0.044		
						(0.091)		
COMPET.							−0.143	
							(0.228)	
TRANS.								−0.143
								(0.301)
log L	−324.3	−324.6	−324.2	−324.6	−324.6	−324.5	−324.4	−324.5
Adj. R^2	0.589	0.593	0.592	0.590	0.590	0.591	0.591	0.591

Notes: Number of observations: 213. All models include source country fixed effects. Heteroskedasticity-robust standard errors (HC1) in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table 7: OLS models for average sales of foreign controlled firms in 2015

Variables	M0	M0r	M1	M2	M3	M4	M5	M6
Distance	0.117							
	(0.214)							
Culture	−0.010							
	(0.141)							
Borders	0.883***	0.792***	0.797***	0.793***	0.775***	0.792***	0.821***	0.780***
	(0.296)	(0.239)	(0.254)	(0.251)	(0.250)	(0.251)	(0.254)	(0.251)
Size sim.	0.315**	0.312**	0.354**	0.317**	0.311**	0.312**	0.339**	0.345**
	(0.142)	(0.141)	(0.142)	(0.142)	(0.141)	(0.143)	(0.142)	(0.146)
Factor diss.	−0.028	−0.022	−0.028	−0.0.021	−0.109	−0.021	−0.023	−0.021
	(0.346)	(0.345)	(0.335)	(0.345)	(0.345)	(0.346)	(0.290)	(0.341)
Host GDP	0.511***	0.520***	0.480***	0.513***	0.499***	0.520***	0.539***	0.488***
	(0.104)	(0.104)	(0.104)	(0.104)	(0.106)	(0.105)	(0.106)	(0.107)
Host wages	−0.401*	−0.415*	−0.338	−0.398*	−0.389*	−0.412*	−0.375*	−0.341*
	(0.234)	(0.228)	(0.224)	(0.224)	(0.227)	(0.241)	(0.230)	(0.227)
STRI			−0.635					
			(0.412)					
ENTRY				−0.091				
				(0.286)				
PEOPLE					−0.463*			
					(0.264)			
OTHER						0.004		
						(0.099)		
COMPET.							−0.331	
							(0.230)	
TRANS.								−0.318
								(0.262)
log L	−389.4	−389.6	−388.2	−389.6	−388.0	−389.6	−388.5	−388.9
Adj. R^2	0.517	0.522	0.525	0.519	0.525	0.519	0.523	0.522

Notes: Number of observations: 238. All models include source country fixed effects. Heteroskedasticity-robust standard errors (HC1) in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

this indicator. Using instead the index values for 2014 in the models for 2015 leads as for the 2014 models to insignificant estimates of the impact of restrictions on the movement of people.

Summing up, the estimations for the determinants of the intensive margin of retail trade FDI activities confirm the conclusions from the estimations for the determinants of the extensive margin in section 4.1. Once one firm from country j has been able to jump over the hurdle to enter the retail trade sector in country i, the existing service trade restrictiveness is neither a relevant factor for the number of following firms from country j in that market nor for the average employment or average sales of these firms (the intensive margin of retail trade FDI activities of country j in country i).

5. Conclusions

After the consolidation of the EU Single Market for goods, policy makers focus now on the integration of service markets. Efforts to spur this integration include the reduction of service trade restrictions and retail trade services are considered as a especially important service market, because "retail brings the Single Market to the EU consumers with a wider choice of products available to consumers" (EU, 2018). Also from a scientific point of view, there has been a growing interest in the analysis of the internationalisation of retail trade, since several characteristics of retail trade services seem to curb the transferability of theoretical and empirical insights based on the internationalisation of manufacturing firms.

Based on a review of recent economic theories developed to explain the internationalisation of firms and a discussion of necessary adaptations of these theories to special features of the retail trade sector, this paper offers an empirical analysis of the determinants of the extensive and intensive margin of FDI activities of 42 countries in 23 EU countries. Special attention is paid within a gravity model framework to the impact of service trade restrictions on both margins of retail trade internationalisation. Furthermore, the use of hurdle models for count data to estimate the determinants of the extensive margin takes into account that there are a lot of "true" zero counts for the number of retail trade firms controlled by a specific source country in a certain EU host country.

The estimation results for the extensive margin of retail trade FDI activities show that service trade restrictiveness, especially restrictions on foreign entry, but also most of the measures from other policy areas, increases the hurdle that at least one firm from country j controls a retail trade firm in country i. Once one firm from country j has jumped over the hurdle in country i, service trade restrictiveness is not a relevant factor for the number of following firms from country j. Then, only the explanatory variables derived from the theoretical literature have a robust

significant impact. However, service trade restrictions do not make the hurdle insurmountable, since there are several countries that control retail trade firms in each of the 23 EU countries with available STRI data.

The estimations for the determinants of the intensive margin of retail trade FDI activities confirm these conclusions. Once one firm from country j has been able to jump over the hurdle to enter the retail trade sector in country i, the existing service trade restrictiveness also do not have a significant negative impact on average employment or average sales of the firms active in a foreign market.

Thus, from a policy point of view, the results suggest that reductions of service trade restrictions are, on the one hand, particularly important for those potential host countries that still have a lot of zero counts of foreign controlled retail trade firms. On the other hand, a reduction of these restrictions might facilitate for some potential source countries the entry into some foreign markets. However, according to the argument of Helpman et al. (2004) and the literature based thereupon, these newcomers in markets with formerly higher restrictions might be less productive controlling firms, which are now able to pay the lower entry costs.

The results of this study look rather robust and promising, but a larger overlap of the data from Eurostat's FATS database and the STRI database of the OECD would be desirable in the future in order to apply sophisticated panel data approaches to identify the effects of intertemporal changes of regulations on bilateral international retail trade engagement. Progress in this direction could also stimulate research with regard to the question whether increased retail trade FDI would consequently stimulate trade of goods – either from the source or host country – or productivity in consumer-near manufacturing sectors like food and beverages (e.g. Nordas, 2008; Fernandes and Paunov, 2012; Mariotti et al. 2013).

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