Learning to Import from Your Peers

Márta Bisztray, Miklós Koren and Ádám Szeidl

Preliminary and incomplete, do not circulate

December 9, 2016

Abstract

We estimate knowledge spillovers in importing. Using firm-level data from Hungary we document that firms with peer firms—connected through close spatial or managerial networks—that have trade experience with a particular country are more likely to start importing from that country. Our empirical strategy is based on variation in partner countries, controlling for firm-year and country-year effects and for ownership links between the firm and the peer, thus eliminating several possible alternative explanations. We show that knowledge spillovers are highly localized in space, and that firms learn more from larger, more productive and same-industry peers which import the same product. Our results suggest that even in a very open economy information frictions form an important barrier to importing.

I Introduction

Evidence suggests that imports have a positive effect on firm productivity (Amiti and Konings 2007, Halpern et al 2015). Yet there is much heterogeneity in seemingly similar firms' importing behavior. One possible explanation for this heterogeneity is informal trade barriers based on information and trust. Indeed, specific knowledge, and access to a trusted trading partner, may be important for a productive import relationship. When such informal barriers are active, importing, and its productivity benefits, may diffuse from firm to firm through personal and business connections. In the context of exports, Mion and Opromolla (2014) and Fernandes and Tang (2014) document this mechanism: they show that knowledge diffusion in managerial and neighborhood networks affect firms' export behavior. But from these studies about exports one cannot generalize to knowledge diffusion about imports. While finding an import partner may be easier, finding a high-quality partner who can be trusted may be harder than in the case of exports. At the same time, measuring the barriers to importing and the underlying mechanisms is important given the potential productivity gains from importing.

In this paper we use firm-level data from Hungary to document knowledge diffusion in importing. We have two main contributions. First, our rich observational data allows us to use an empirical strategy which rules

out many alternative stories and helps us measure diffusion in multiple networks. Specifically, we exploit source-country variation in importing, effectively asking whether a peer with import experience from the Czech Republic, rather than Slovakia, makes the firm more likely to import from the Czech Republic than from Slovakia. And we can trace diffusion through narrowly defined neighborhood networks, including the same building and directly neighboring buildings; through managerial networks created by managerial moves; as well as through ownership networks. Second, we exploit information on peer firms and the characteristics of imported goods to shed light on the mechanism of knowledge spillovers. Our results show knowledge flows in all three networks; and also that these flows are highly localized in space and stronger when peer firms are larger, more productive, are in the same industry, and import the same product. These results support the view that knowledge specific to the foreign market segment is important for importing, and highlight a potential benefit of industrial clusters for encouraging international trade.

For the analysis we use rich firm-level panel data on Hungarian firms during 1993-2003. We combine three data sources which cover this period: a Hungarian firm register from CompLex, balance sheet data from the National Tax and Customs Administration and trade data from the Hungarian Customs Statistics.[1] The firm register contains the full universe of Hungarian firms, including the precise address of the firm, all the owners and employees having signing right, and the country of the owners. As a result, we can follow moves of people and changes in ownership links between firms and over time. The balance sheet data also contain information on the industry and the foreign ownership share of firms. Moreover, for each firm we have annual trade data on country-HS6 product level.

Our empirical strategy is to estimate a linear probability model measuring the effect of peer firms' country-specific experience on a firm's decision about starting to import from a given country from which it had not imported before. Our identification comes from cross-country variation in peers' experience. We discuss concrete threats to identification below. We look at four countries which are comparable in terms of imports from Hungary: the Czech Republic, Slovakia, Romania, and Russia. To ensure that all firms are the same distance from any foreign country we only include firms located in Budapest. The key variables in the estimating equation are indicators for peers' past experience with a given country. We separately include peer experience indicators for all three networks: closely-located, person-connected as well as ownership-connected peers. Closely-located peers can be firms in the same building, in the closest neighboring buildings, or in the closest cross-street buildings. Person-connected peers are firms from whom a person with signing rights has moved to the firm of interest where it became an owner. And ownership-connected firms are firms sharing ultimate owners with the firm of interest. We exclude ownership connected firms from the closely-located and person-connected categories. In our regression we include firm-year and country-year fixed effects, thus effectively identifying from variation within a firm in a given year. Specifically, we ask if having a peer that has past foreign experience with a given country increases the probability of starting to import from *that country* rather than from another country.

Our first main result is that there are significant positive import spillovers in all three networks. Regarding neighborhood networks, spillovers are highly localized in space. Having a neighbor with import experience in

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[1] We do not have access to the trade data after 2003.

the same building increases the probability of starting to import by 0.2 percentage points. This doubles the average probability of starting to import from one of the four countries. The effect of a firm with a similar experience in the neighboring building is only one-fifth as large. Person-connected peers matter as well, but only those with export experience. Ownership links are also important: the effect of country-specific import experience in the ownership network is more than twice as large as the effect of a same-building peer. Our main results are robust to several specification changes. The magnitude of the effects is comparable to export spillovers estimated with a similar identification strategy. These findings suggest that spillovers from experienced peers are important in the decision of starting to import from a given country. Firm clusters may help to increase not only exports, but also imports.

A key identification concern is omitted variables: those firms which tend to import from a given country also tend to become peers for reasons unrelated to learning. For example, firms may cluster by ownership or industry and these firms also tend to import from the same country. Our empirical approach addresses this concern in a number of ways. First, our basic empirical specification by design rules out several omitted variables. The neighboring building versus cross-street building comparisons rule out spatially correlated omitted variables as long as knowledge spillovers decay faster than the spatial correlation in the omitted variable. Because we control for ownership links across firms, we also control for omitted variables based on joint ownership. And we show below that firms also tend to learn from peers operating in different industries, addressing same-industry clustering. Second, we complement our basic specification with an event study which exploits firm moves. We look at firms with country-specific import experience moving into an address where no such experience was present earlier. The move can be regarded as a plausibly exogenous shock to local country-specific knowledge. We show that firms located in such an address start to import from the country with a higher probability than from other countries. Third, we also address the reverse causality problem that firms about to import hire expert managers with country-specific experience, by showing that spillovers are also present when the firm gets a new owner with country-specific experience, as new owners are unlikely to be matched to firms based on plans to import.

Our second set of main results concern heterogeneity of the spillover effect. We explore heterogeneity both by the characteristics of the firm and the characteristics of the peers. We find that the effect of same-building and ownership-connected peer experience is present in almost all firm or peer groups, but with varying magnitude. Specifically, larger, more productive and foreign-owned firms learn more. Similarly, firms learn from those peers more which are larger, more productive or foreign-owned. These average effects hide additional heterogeneity based on the productivity gap between the firm and its peer: high-productivity firms tend to learn even more from high-productivity peers then low-productivity firms do.

We also look at heterogeneous effects based on industry and product category. We find that the effect of peers operating in the same industry or having import experience with the same product category is significantly larger than the effect of other peers. At the same time, spillovers from peers operating in different industries or importing different product types is also significant. As mentioned above, the existence of these cross-industry and cross-product effects supports our identification strategy. The larger peer effect within industry and product category, in combination with the larger peer effects among similarly-productive firms,

highlights one benefit of putting similar firms into industrial clusters. It appears that knowledge spillovers are higher among firms facing similar business decisions.

Finally we show that the estimated effect is increasing in the number of experienced peers. Using this result we calculate the social multiplier of a new importer, looking at each non-importer firm in our sample. We show that a targeted policy helping a firm with high spillover potential to start importing can considerably increase the multiplier effect compared to a non-targeted policy.

I.A Literature

This paper is related to the literature on knowledge spillovers in trade. These papers examine how knowledge transfer from spatial neighbors, moving employees or foreign-owned firms in the industry affects a firm's export. To our knowledge similar analysis on imports is scarce.

Neighbors with export experience: There are quite a few papers on how firms learn to export from neighboring firms with export experience. This literature finds mixed effects for neighbors with general export experience. On the one hand, Aitken et al. (1997), Barrios et al. (2003), Bernard and Jensen (2004), Lawless (2009) and Pupato (2010) find no significant export spillovers for Mexican, Spanish, US, Irish or Argentine firms. On the other hand, Clerides et al. (1998) find some evidence on regional and industrial export spillovers in Colombia, Mexico and Morocco. Lovely et al. (2005) show that US exporters are spatially correlated, and this correlation increases with the difficulty of the market. Greenaway and Kneller (2008) find that agglomeration spillovers increase the probability of export entry for firms in the UK. Dumont et al. (2010) look at the channels of export spillovers for Belgian firms, finding that both increased productivity and decreased perceived sunk cost play an important role.

Neighbors with country-specific export experience: Findings on the effect of neighbors with country-specific export experience are more conclusive. Koenig (2009) shows the presence of destination-specific and destination-industry-specific export spillovers for French manufacturing firms. Koenig et al. (2010) show that there are only extensive-margin effects of export spillovers, which are stronger for product- or destination-specific neighbors. Castillo-Giménez et al. (2011) show the existence of country-specific export spillovers on the choice of entry to a new export market for Spanish firms. Ramos and Moral-Benito (2013) show that entry is more likely and export relationships are more stable if also nearby firms export to a country. Firms are more clustered if they sell to more difficult markets. Mayneris and Poncet (2013) also show that export spillovers are product- and country-specific, and stronger for more difficult markets. Artopoulos et al. (2013) do case studies in Argentina to show the crucial role of country-specific knowledge spread by export pioneers in starting to export to a developed country.[2] In this paper we use closely located countries, still finding positive spillovers from peers. The previous two papers suggest that spillover effects might be even larger for more exotic countries. Fernandes and Tang (2014) build a decision model in which a positive signal from the neighbors increases entry probability. Chinese data match the predicted patterns. Mayneris and Poncet

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[2]Krautheim (2012) uses this result in a theoretical paper to explain why the effect of distance on trade doesn't decrease over time. He shows that export spillovers combined with the pattern that less firms export to remote markets can explain this puzzle.

(2015) also find product- and country-specific spillovers in China from neighboring foreign firms. Compared to all these papers we use a much finer definition of geographic neighborhood. The previous papers look at neighbors in the city (Fernandes and Tang, 2014), in the employment area (Koenig, 2009 and Koenig et al., 2010) or in an even larger agglomeration, whereas we use neighbors only in the same, neighboring or cross-street buildings. As Arzaghi and Henderson (2008) show, networking benefits have a rapid spatial decay.[3] Thus we might find stronger import spillovers using a narrower neighborhood definition. Additionally, as opposed to most of the papers (except Fernandes and Tang, 2014), we include country-year and firm-year fixed effects and identify the spillover effect only from cross-destination variations within a firm. A recent paper of Kamal and Sundaram (2015) uses rich data on Bangladeshi textile firms exporting to US firms, estimating partner-specific export spillovers. While we have no data on import partners, our results are more general by including firms operating in different sectors. Finally we also include person-connected and ownership-connected neighbors and look at the effect of different types of country-specific experiences: imports, exports and ownership. A closely related paper of Choquette and Meinen (2015) also separate different mechanisms for export spillovers. They look at the effect of high-wage labor movement, intra-industry spillovers and inter-industry backward and forward linkages for manufacturing firms in Denmark. They find heterogeneous effects by firm size and export market. As opposed to this paper they use a broader neighborhood definition, commuting areas. Using country-specific export and ownership experience is also a novelty of the current paper.

Moving employees: Choquette and Meinen (2015) also relate to another strand of the literature, which look at knowledge spillovers transferred by moving employees. Bertrand and Schoar (2003) show that a manager-fixed effect explains a large part of the heterogeneity in firms' decisions. Balsvik (2011) find that employees with experience in multinational firms increase the productivity of non-multinational Norwegian manufacturing plants. Additionally, their private return is smaller than the benefit of the firm. Stoyanov and Zubanov (2012) show that Danish firms hiring workers from more productive firms increase their productivity in a persistent way after the hiring. Some more recent papers focus on the effect of experienced movers on the export decision of firms. Mion and Opromolla (2014) show on Portuguese data that a firm with an entering manager who has previous export experience has higher export performance, including higher probability of entry. This effect is even stronger for market-specific experience. In a follow-up paper Mion et al. (2015) find that country-specific or product-specific export knowledge of the manager matters for export performance. Sala and Yalcin (2015) find that Danish firms having a manager with general export experience start to export with a higher probability. Masso et al. (2015) use Estonian data to have similar findings for region-specific export experience but not for general export experience. The effect is stronger if it is more recent experience and if it is in exporting a similar product. In the current paper knowledge transfer by moving managers is only one of the potential channels of import spillovers. As opposed to most papers mentioned before we can explicitly control for ownership links between the firms, which gives a more reliable identification of the manager effect. Additionally, we use different definitions of moving managers to handle the problem of reverse causality. Finally, we also consider managers with previous experience in firms having export, import

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[3]See Henderson (2007) for a review of the knowledge spillover literature.

or ownership connections to a specific country.

Foreign ownership: One type of country-specific experience we look at is ownership from a specific country. There are papers which investigate the effect of multinational firms on the export behavior of local firms. Greenaway et al. (2004) find that domestic firms in the UK start to export with a higher probability and export more in the presence of multinationals. Kneller and Pisu (2007) find the same for foreign firms in the same industry and region or in downstream industries. Sun (2009) have similar findings for China. As opposed to these papers we look at the effect of country-specific ownership.

Import spillovers: To our knowledge, only Harasztosi (2011, 2013) estimates the effect of import spillovers on starting to import from a specific country. Harasztosi uses Hungarian data and applies the approach of Koenig et al. (2010), finding that only same-country and same-product neighbors matter. He uses NUTS4 neighborhoods which is broader than our definition. Our approach is also different in terms of capturing different spillover channels and different types of country-specific experience.

The rest of the paper is organized as follows. In section II we describe the data and present some stylized facts. Section III presents the identification strategy. Section IV presents the results and section V concludes.

II Data and stylized facts

II.A Data

II.A.1 Data sources

For our analysis we use rich data on Hungarian firms. We combine three firm-level panel datasets. The first is the Hungarian Company Register from CompLex Kiadó Kft. It contains the full universe of Hungarian firms for the period 1990-2013. It includes data on firm name, tax id, precise address up to building, floor and door number, and owners of the firm with tax id for firms and address and mother's name for people. It also has information on the country of the owners. Finally, it also includes firm representatives with address and mother's name, allowing to follow people moving across firms. These can either be directors, members of the supervisory board or other employees with signing right. We can follow changes over time, as all these entries include precise start and end dates. We also know the age of the firms.

Our second source is the official balance sheet database from the National Tax and Customs Administration of Hungary. It includes the full universe of double-bookkeeping Hungarian firms for the period 1992-2013. Beyond balance sheet data it also includes the foreign-owned share of the firm and its industry. We classify a firm as being foreign-owned if it has majority foreign ownership. We use the industry classification up to two digits, which corresponds to NACE Rev. 1.1. For the analysis we use estimated total factor productivity (TFP) of firms. For these we assume a Cobb-Douglas production function with coefficients varying by two-digit industries, and with labor, material and capital as inputs. We use the method of Levinsohn and Petrin (2003) for estimating TFP. We assign firms to productivity quartiles based on the

average of their 2-digit-industry-specific productivity percentile in the period $[t-2,t]$. This procedure allows for changes in productivity over time, but it doesn't allow for large jumps from one year to the other.

Our third data source is the Hungarian Customs Statistics. It contains yearly imported and exported value by firm, country and product for the period 1991-2003. Products are given by HS6 classification. For the analysis we group these by the purpose of the product, assigning them to Broad Economic Categories (BEC). Additionally, we also use the product classification of Rauch, which separates goods traded on an organized exchange, reference-priced goods and differentiated products.[4] We use data on four comparable import countries: the Czech Republic, Slovakia, Russia and Romania. There are separate trade data for the first two only from 1993 on, as Czechoslovakia was split into the Czech Republic and Slovakia in 1993. As detailed trade data which we can match to the other two data sources is only available up to 2003, the period of our analysis is 1993-2003.

II.A.2 Summary statistics

Overall, there are 991,627 firms in the database. We use only firms with headquarters in Budapest, ending up with 212,859 firms on 79,097 distinct addresses. When a firm moves its headquarters out of Budapest, it gets out of the sample as if it died. We define a firm as an importer from a country if it ever imported before from that country. In this way we assume that country-specific import experience stays also in the long run. We define exporter and ownership experience in an analogous way. We focus on firms starting to import from a destination, conditional on never importing from there before. In our sample there are 209,423 firms in Budapest not yet importing from at least one of the four destinations, located in 77,640 different addresses. 10,598 firms located in 9466 different addresses import from at least one of the destinations in the observed period. Table A1 of the Appendix shows the number and average characteristics of firms by countries they import from. Figures A1-A3 of the Appendix show their industry composition for each import country, also for new importers separately. All these show that firms importing from different countries are similar in terms of observables. Table A2 of the Appendix presents the yearly total number of firms and the number of importers per country. Table A3 of the Appendix shows the share of firms importing from one or multiple countries. Somewhat more firms import from the Czech Republic and somewhat less from Russia, importers from the Czech Republic tend to import also from Slovakia, but overall, the shares are quite similar. As in the main analysis, here we define importers as firms which imported from that country ever before. The second column presents the same pattern for successful importers. We define a firm as a successful importer in year t if it imports from a country at least twice in the 3-year period $[t-1, t+1]$. The table shows the share of importers which were ever successful. Less than one third of the ever importer firms is also a successful importer. Table A4 of the Appendix shows that the imports of a firm is highly concentrated by the type of the good. Most firms in our sample import industrial supplies (BEC category 2 and 3) and firms in the second most popular group import mainly consumer goods (BEC category 1 and 6).

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[4]The classification is available at `http://econweb.ucsd.edu/~jrauch/rauch_classification.html`.

II.A.3 Creating groups of peers

Geographic neighbors: We use a highly localized definition of geographic neighbors. We look at peers separately in the same building, in the neighboring building (defined by same street and building number +/-2) and in the cross-street building (defined by same street and building number +/-1). We create three different indicator variables for each firm-country pair in each year which show if there is a peer in the same, neighboring or cross-street building which has import experience from the specific country. We do the same for country-specific export and ownership experience. Table A5 of the Appendix shows the share of firms with different number of neighbors in the same, neighbor or cross-street building. Firms have typically few neighbors. 22% of the firms have no neighbors in the same building and more than one third have at most one neighbor. We take out those firms from the analysis which have more than 50 neighbors in the same or in the neighboring buildings, ensuring that our results are not moved by large hubs. We also exclude those firms from the geographic neighbors which have ownership links to the firm of interest in the given year.

Person-connected peers: There are more than 1.4M people in our data, more than 940,000 with signing right, also including directors and CEO-s, and more than 1.3M owners. In our baseline definition we define firm A to be a person-connected peer of firm B in year t if 1. there is a person who is an owner in firm B in year t, 2. and who had signing right in firm A before t. Firm A is a person-connected peer with country c-specific import experience of firm B in year t if 1. there is a person who is an owner in firm B in year t, 2. and who had signing right in firm A before t, 3. and firm A already imported from country c before t and before τ, where τ is the date of separation of the person from firm A. The aim of using only owners of firm B is to mitigate reverse causality concerns. It might be that firms planning to import from a country employ a manager with country-specific experience in order to help in importing, which they would also do without the manager. It is less likely though that a new owner is brought to the firm in order to make use of her country-specific experiences. Nevertheless, we also use two alternative definitions for person-connected peers. In the first we require that the connecting person has a signing right in firm B. In the second we allow for any connections to both firms. In all cases we exclude liquidators and people connected to more than 15 firms from the connecting people. We also exclude firms from person-connected peers which are on the exact same address (including floor and door number) or which are ever connected to the firm through direct or indirect ownership links. Yet, we also consider person-connected peers outside Budapest. As a result we end up with more than 1.1M firm pairs connected by people using the baseline definition. There are almost 1.4M firm pairs when a connecting person is defined as having signing right in both firms. There are 2.8M firm pairs when any type of connection is considered.

Onwership-connected peers: Firm A and B are in the same ownership network in year t if they have a common ultimate owner. This means the firms 1. either have a direct or indirect common owner, 2. firm A is a direct or indirect owner of B, or 3. firm B is a direct or indirect owner of A. Firm A is an ownership-connected peer of firm B with country c-specific experience in year t if A and B are in the same ownership network in year t and A already has country c specific experience in year t. Firms in the same ownership network outside Budapest are also considered. As a result we get more than 4.7M firm pairs in

the same ownership network.

II.B Stylized facts

Looking at basic patterns in the data suggests that there is a connection between having peers with country-specific knowledge and starting to import from the same country. Table A6 of the Appendix shows the share of observations by different peer categories in which the firm has a peer with country-specific experience (column (1)) or experience with any of the four countries (column (2)). Export and import experience are not necessarily present together, and there are less observations with peers having an owner from a given country. There are closely located neighbors with country-specific experience in more than 20% of the observations. The share of observations with person-connected or ownership-connected experienced peers is much lower. Columns (3) and (4) show the share of observations within each peer group in which the firm has ever imported from the country. This share is higher for firms with an experienced peer than for firms without such peers. The share of importers is the highest if there are both importing and exporting peers, suggesting that both type of experience might be valuable. The share of importers with peers having only import experience is higher than the same share with peers having only export experience. This suggests that the same type of experience might matter more. The share of importers is higher in those groups which have experienced peers from multiple peer groups. This suggests the importance of all the different channels. Still, these patterns cannot serve as an evidence for a causal relationship between the presence of experienced peers and import entry.

Table A7 of the Appendix shows that the share of importers is higher among those firms which have more neighbors in the same building, and even higher if these peers have import experience. Table A8 of the Appendix includes firms which start to import from at least one of the countries. It has four separate panels for the different types of peers. Within each panel the first row shows the share of firms which start to import from a single country c, and the second row is the share of firms which start to import from any other country but c. Percentages do not add up to one as we exclude those firms which start to import from both c and from another country at the same time. In the first column there are those firms which have peers of a certain type with c-specific experience but which have no peers with experience from other countries. The second column includes those firms which have some experienced peers but the experience is not country c-specific. We calculate the shares for each of the four countries separately and present their weighted average, where the weights are the number of observations for a given country. Looking at any peer group, the share of importers from country c is always higher among firms which have only peers with country c-specific experience than among those which have peers with other experience. These patterns suggest that peers with country-specific experience play an important role in a firm's decision about starting to import from a specific country. Though we still need to test causality by controlling for potential confounding factors.

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III Empirical strategy

III.A Identification strategy

Our main hypothesis is that firms learn from neighbors and other connected firms which already have country-specific experience, most importantly which already imported from a given country. As a result, firms with experienced peers import from the country with a higher probability. The main threat to identification is that importing firms locate close or become connected to each other for other reasons. Then what we see is not learning, only co-location or connectedness of special firms. The identification strategy we use aims to address this issue.

We identify from cross-country variation within a firm. This allows us to control for time-varying characteristics of a firm being common across all countries and time-varying characteristics of a country being common across all firms. Our identification comes from the different number of peers having experience with the different countries and the change of these peers over time. We assume that omitted variables are not specific to a particular country. Concerning geographic neighbors we also use a highly localized neighborhood to measure knowledge spillover. This helps our identification, as we can assume that knowledge spillover decays faster with distance than the correlation in omitted variables. This choice can also be motivated by the findings of Arzaghi and Henderson (2008) who find that knowledge spillovers are highly localized in space. For person-connected peers we can also exploit the timing of managers getting connected to new firms.

We focus on the decision to enter a new import market, using the sample of not yet importers from the given country. In our definition of importers and experienced peers we assume that experience remains after being ever obtained. A firm is an importer - i.e. it has import experience - from Slovakia in year t if it ever imported from Slovakia in t or before. Similar definitions apply for exports and ownership from one of the four countries. We also do robustness checks looking at the effect of more recent experience.

In the estimation we only include firms in Budapest. In this way the distance from a given country is the same for all of the firms. We use peers from the previous year to handle simultaneity and to allow for time to build new import relations. As opposed to the majority of the export spillover literature, in our main specification we don't look at the number of experienced peers, only the existence of such peers matter. In this way we assume that the main difference is between firms having or not having an experienced peer, and we do not control for the cumulative effect of additional peers in the same peer group. We do some robustness checks to see if this assumption holds.

III.B Estimation

We estimate a linear hazard regression using the following equation:

$$X_{ict} = \sum_{n} \sum_{m} \beta_{nm} X_{nm}(a(i, t-1), c, t-1) + \mu_{ct} + \alpha_{it} + \epsilon_{ict} \tag{1}$$

The unit of observation is firm-year-country. The dependent variable X_{ict} is an indicator for firm i being an importer (i.e. imported ever before up to that year) from country c in year t. On the right-hand side we include separate indicators for the different peer groups and country-specific experience types. $X_{nm}(a(i, t-1), c, t-1)$ is one if there is at least one firm in firm i-s peer group n in year $t-1$ which has experience type m from country c. In the analysis we look at the effect of peers from the previous year. As a result we use the period 1994-2003 in the estimation. We include five different peer groups (n): 1. firms in the same building, 2. firms in the neighboring building (building number $+/-2$), 3. firms in the cross-street building (building number $+/-1$), 4. previous firms of the entering new owners and 5. firms in the same ownership network. We define geographic neighbors in year t based on the address a of firm i in year t. We include separate indicators for three different experience types (m): 1. imports, 2. exports and 3. having an owner from the country. In some of the specifications where we look at heterogeneous effects by type of the peers we only include import experience. We use four comparable source countries: $c = \{$the Czech Republic, Romania, Russia, Slovakia$\}$. Our baseline estimation sample includes firm-year pairs only in those years when the firm has not imported from the country until the previous year, but it might start to import in year t. We also include those firm-country pairs in which the firm never starts to import from the country in the period of observation. Then $\beta_{nm} > 0$ means that a peer in peer group n with country-specific experience of type m has a positive effect on the probability of the firm starting to import from the same country in the next year. μ_{ct} denotes country-year fixed effects and α_{it} denotes firm-year fixed effects. ϵ_{ict} is the error term. We cluster the standard errors by building. In the section where we look at the heterogeneity of the estimated effect by the characteristics of the firm we interact the indicator variables X_{nm} with indicators for firm groups. We also look at the heterogeneity of the spillover effect by the type of the peer. There we include X_{nmg} indicators which show if there is a peer in peer group n with country-specific experience type m in firm group g, where g can stand for size, productivity, ownership or industry.

III.C   Identification issues

The major concern with our identification strategy is the following: our estimates are biased if there is any remaining firm-country-specific variation correlated with both the import entry decision and the existence of peers with country-specific experience. It might happen that those firms co-locate or become connected through person or ownership links for which it is easier to import from a given country. One reason for that might be the clustering of firms by industry. Firms in the pharmaceutical industry might import chemicals from country c and firms in the paper industry might import raw materials from country c'. If pharmaceutical firms co-locate in district D and paper firms co-locate in district D', we incorrectly attribute the observed patterns to knowledge spillovers. Alternatively, there can be good locations within Budapest where firms import from the West and bad locations where firms import from the East. We address this issue in multiple ways. First, we use quite comparable countries in the analysis. This makes it less likely that good firms import from one country and bad firms import from another. Table A1 of the Appendix also shows that observable characteristics of importers from the different countries are similar. Second, we

control for ownership links among firms. This rules out the possibility that two firms are closely located and start to import in a sequential way because of a common owner's decision. Column (1) of Table A14 in the Appendix shows that without accounting for ownership links some of the estimated effects would be upward biased. Third, we address concerns with the co-location of same-industry firms by looking at the effect of experienced peers operating in the same industry as the firm or in a different industry. Table 5 shows that peers operating in the same industry have indeed a larger effect, but peers from different industries also increase the probability of import entry. Finally, we also show an event study type evidence, exploiting movers with import experience within Budapest. Firms getting a new neighbor with import experience from a country start to import from this country with a higher probability than from other countries with which the mover has no experience.

IV Results

IV.A Baseline results

Table 1 shows our main results.[5] In columns (1)-(3) we only include indicators for peers with import experience, separately for each peer group. Column (4) includes all peer groups and in column (5) we add indicators for peers having export or ownership experience from the country. Coefficient estimates are quite stable across the different specifications. Only the effect of person-connected importer peers becomes insignificant after controlling for the other types of peers. We cannot claim though that the effect of person-connected peers is zero, as estimates are noisy. Results show that all types of peer groups and all type of country-specific experience has an effect on import entry, but with varying magnitudes. The probability that a firm starts to import from a country is 0.2 percentage points higher when in the previous year there was a neighbor in the same building which already imported from that country. The neighbor effect is highly localized in space. The effect of an importing firm in the neighboring building is about one fifth of the same-building effect. The effect of a firm's import experience in the same ownership network is about twice as large as the same-building effect. We do not consider it as a knowledge spillover, it merely documents that import decisions are correlated within the ownership network. This might be the result of sequential importing decision by common owners.

Peers with country-specific export experience also play a role in the import entry decision, but to a lower extent than peers with import experience. The only exception is person-connected exporter peers which have a considerable effect on the import decision. Our specific definition of person-connected peer can be responsible for this pattern. Connecting people are former managers of a firm becoming owners of another firm. Their new firm might do somewhat related but different activities than the previous one. In this case some of the previous business partners might be useful for providing inputs for the new activity. Finally, those neighbors in the same building which are owned from a given country also increase the probability

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[5]In all tables presenting estimation results coefficients are multiplied by 100, so that the estimated effect is in percentage points.

of starting to import from the same country, but their effect is about a quarter of the importer neighbors' effect.

Table 1: The effect of peers with country-specific experience on the probability of starting to import from the same country

Sample: not yet importers until the previous year
Dependent variable: Importer

	(1)	(2)	(3)	(4)	(5)
Cross-street exporter neighbor					-0.0173
					(0.023)
Neighbor-building exporter neighbor					0.034*
					(0.0204)
Same-building exporter neighbor					0.0254
					(0.0218)
Person-connected exporter neighbor					0.244**
					(0.101)
Owner-connected exporter neighbor					0.134***
					(0.0403)
Cross-street importer neighbor	0.0309			0.0297	0.0316
	(0.0245)			(0.0245)	(0.0244)
Neighbor-building importer neighbor	0.044**			0.0434**	0.0392*
	(0.02)			(0.0199)	(0.0204)
Same-building importer neighbor	0.224***			0.221***	0.214***
	(0.0258)			(0.0257)	(0.0259)
Person-connected importer neighbor		0.153*		0.131	0.0996
		(0.0913)		(0.0909)	(0.092)
Owner-connected importer neighbor			0.536***	0.531***	0.511***
			(0.0494)	(0.0494)	(0.0492)
Cross-street neighbor owned from the country					0.0221
					(0.0289)
Neighbor-building neighbor owned from the country					-0.0185
					(0.0201)
Same-building neighbor owned from the country					0.0566**
					(0.0261)
Person-connected neighbor owned from the country					0.159
					(0.214)
Ownership-connected neighbor owned from the country					-0.0435
					(0.0693)
Firm-year FE	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES
Nr. of observations	3,778,517	3,778,517	3,778,517	3,778,517	3,778,517

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year. An exporter or importer neighbor refers to a peer with country-specific export or import experience. A neighbor owned from the country refers to a peer who ever had an owner from the given country. Same building refers to the building of the firm, cross-street refers to building number +/-1 and neighbor building refers to building number +/-2. Person-connected neighbor refers to a peer which had a manager who became an owner in the firm of interest. Ownership-connected neighbor refers to a peer in the same ownership network. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

These results suggest that peers with country-specific import experience are the most important for the import entry decision. Controlling for the experience of other firms in the same ownership network,

experienced neighbors in the same building have the strongest effect on the import decision. The baseline probability of firms starting to import from a country is 0.00252 in our estimation sample. This means that a same-building neighbor which already imported from a given country almost doubles the probability of a firm starting to import from the same country.

IV.A.1 Mover design

We provide further support for our results with an event study.[6] We look at firms which move their headquarters from one address to another within Budapest. Moves are quite frequent, more than 25% of the firms moves at least once.[7] We exploit variation in their country-specific import experience. We look at those movers where no firm imported before from a given country in their new address. Then we consider the appearance of the new experienced firm as an exogenous shock changing local knowledge.

In our event study the estimation sample consists of those firm-country pairs in which the firm is located in a building where a new firm moves, and no other firm in the building has import experience with that country until the year of the move. The mover might but not necessarily has the experience either. We define the event as the year when the earliest mover arrives in the building of a firm. Then we compare the probability of starting to import from the country τ years after the event for firms having a mover with versus without country-specific experience. More specifically, we estimate the following equation:

$$X_{ict} = \sum_{\tau} \beta_{\tau} D_{i\tau} + \sum_{\tau} \gamma_{\tau} D_{i\tau} MX_{ic} + \alpha_{it} + \alpha_{ct} + \epsilon_{ict} \tag{2}$$

where X_{ict} is an indicator for firm i having ever imported from country c up to calendar year t, MX is an indicator for the mover firm having import experience with country c by the time of the move. $D_{i\tau}$ is an event-year indicator, showing that the mover came to the building τ years before. α_{it} and α_{ct} are firm-year and country-year fixed effects and ϵ_{ict} is the error term. The second plot of Figure 1 presents the estimates on the interaction term coefficients γ_{τ} with the 95% confidence interval. The first plot show the same coefficients from an OLS estimate. The results are in line with our previous estimates. The share of firms becoming an importer from a given country after the mover arrived is significantly higher in those buildings where the mover had country-specific experience. The estimated patterns also suggest that the effect of the experienced mover increases over time.

IV.B Mechanism and heterogeneity

In this section we look at the heterogeneity of the estimated effect by the characteristics of both the firm and the peer. As the estimated effect of peers in the same building is the strongest, we present heterogeneity results only for these types of peers, but also include other peer groups in the regressions. Except for person-connected peers, heterogeneity patterns for the other peer groups are similar, but somewhat weaker.

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[6]For further robustness checks see section A of the Appendix.

[7]Descriptive statistics can be found in Table A17 of the Appendix.

Figure 1: The effect of firms with country-specific experience moving to the address on the probability of firms in the same building starting to import from the same country

(a) OLS regression   (b) FE regression
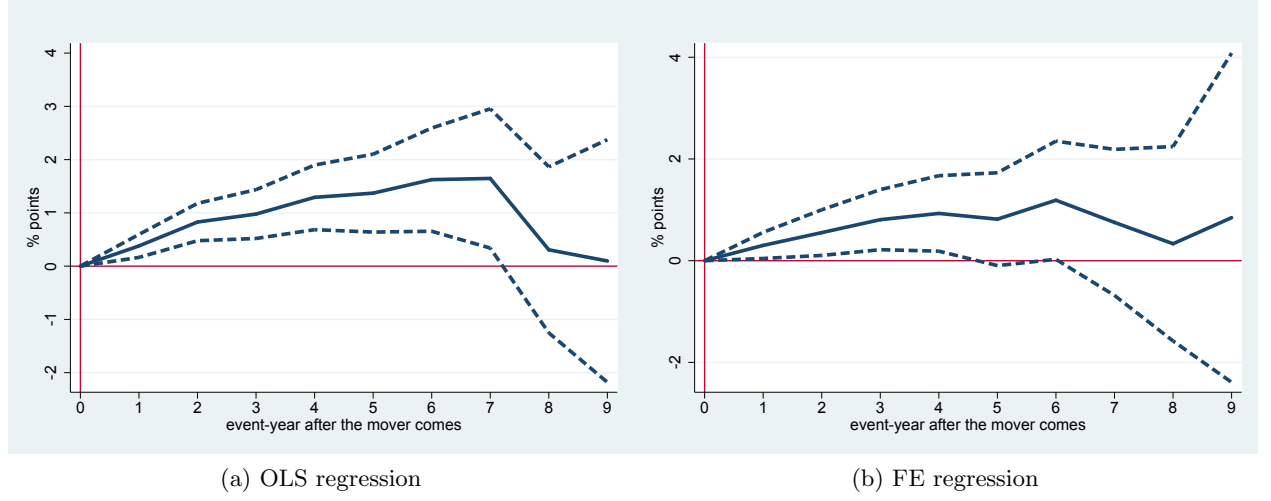
IV.B.1   Heterogeneity by the firm

First, we look at the heterogeneity of the estimated effects by the type of the firm. We interact all the indicator variables for experienced peers with different firm group indicators. We group firms by size, productivity, ownership and industry.

Firm size: Table 2 shows the results for peers with import experience. Column (1) includes the effects by size group. Group 1 refers to firms with at most 5 employees, firms in group 2 have 6-20 employees, firms in group 3 have 21-100 employees and group 4 firms have more than 100 employees. Spillovers from same-building are present in all size groups. The magnitude of the effect increases with the size of firms.

Productivity: The second column of Table 2 shows similar results by productivity quartiles. The estimated effects are clearly larger for more productive firms. There is no effect of same-building peers for firms in the lowest productivity quartile.

Ownership: Column (3) of Table 2 looks at the heterogeneity by ownership. In this specification we include interactions of peer group dummies with a foreign-owned dummy, which is one if the firm has majority foreign ownership from any foreign country. The baseline group consists of domestic-owned firms and firms with no ownership information. The table shows that the estimated import spillovers are higher for foreign-owned firms, but same-building peers have a positive effect on domestic firms as well.

Industry: The first column of Table A9 of the Appendix shows estimation results by the industry of the firm. We use industry groupings based on 1-digit NACE categories. The table shows that the same-building effect is the strongest for firms in manufacturing (NACE group D) and trade and repair (NACE group G), but it is also significant for other firms in the service industry (NACE groups H-Q).

Table 2: The effect of peers with country-specific experience on the probability of starting to import from the same country, by size, productivity and ownership of the observed firm

Sample: not yet importers until the previous year
Dependent variable: Importer

| | Firm groups by | | |
	size (1)	productivity (2)	ownership (3)
Same-building importer neighbor			0.148*** (0.0303)
Same-building importer neighbor x Firm in group 1	0.0753*** (0.0255)	0.00781 (0.0527)	0.658*** (0.109)
Same-building importer neighbor x Firm in group 2	0.624*** (0.122)	0.175*** (0.0552)	
Same-building importer neighbor x Firm in group 3	1.5*** (0.291)	0.359*** (0.0718)	
Same-building importer neighbor x Firm in group 4	3.34*** (0.866)	0.596*** (0.0937)	
Neighbors with export and owner experience	YES	YES	YES
Firm-year FE	YES	YES	YES
Country-year FE	YES	YES	YES
Nr. of observations	2,849,438	2,807,020	2,823,756

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year, interacted by firm group dummies. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. Firm group 1 is 1 if the given firm belongs to the lowest category in columns (1) and (2), or if the firm is foreign-owned in column (3). Size cutoffs are 5, 20 and 100 employees. Quartiles of previous year's TFP estimates by 2-digit industry are used for productivity. Controls for neighbors with country-specific export or ownership experience are also included. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table 3: The effect of peers with country-specific experience on the probability of starting to import from the same country, by the size, productivity and ownership of the peer

Sample: not yet importers until the previous year
Dependent variable: Importer

| | Neighbor groups by | | |
	size (1)	productivity (2)	ownership (3)
Same-building importer neighbor	0.126*** (0.0274)	0.0711* (0.0391)	0.123*** (0.0263)
Same-building importer neighbor in group 2	0.184*** (0.0557)	0.087 (0.0588)	0.313*** (0.0547)
Same-building importer neighbor in group 3	0.291*** (0.073)	0.143*** (0.0516)	
Same-building importer neighbor in group 4	0.0975 (0.104)	0.295*** (0.0569)	
Firm-year FE	YES	YES	YES
Country-year FE	YES	YES	YES
Observations	3,778,517	3,778,517	3,778,517

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific import experience in the previous year, also interacted by neighbor group dummies. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. Neighbor group 1 refers to the lowest category. The reference group consist of group 1 and those neighbors where there is no imformation on size or productivity. In column (3) group 2 refers to foreign-owned peers. Size cutoffs are 5, 20 and 100 employees. Quartiles of TFP estimates by 2-digit industry are used for productivity. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

IV.B.2   Heterogeneity by the peers

We also look at the heterogeneity of the effect by the characteristics of the peers. As before, we group peers by size, productivity, ownership and industry. We also look at the type of the good the peer imported before. In these specifications we include additional indicator variables for firms having a certain type of experienced peer with given characteristics. As we don't have information on all the characteristics for all peers, we also include the original peer indicators. Indicators for specific peer groups show the additional effect of peers with given characteristics compared to the baseline effect of the given peer type. In these specifications we only look at the import experience of peers.

Firm size: Column (1) of Table 3 shows the effect of experienced peers by firm size. Cutoffs are the same as before: 5, 20 and 100 employees. As a reference group we use the smallest size group and those peers for which we have no information on size. Larger neighbors located in the same building tend to have a larger effect, except for peers with more than 100 employees.

Productivity: The second column of Table 3 shows similar estimates for productivity quartiles. We use the lowest quartile and peers without any information on their productivity as a reference group. All types of peers located in the same building have a positive effect, but the effect is larger for high-productivity peers. In Table 4 we check if the stronger effect of high-productivity experienced peers is uniform across productivity groups of the not yet importing firms. In column (1) we define the high-productivity group as firms having their 3-year average productivity in the highest productivity quartile. The reference group includes low-productivity firms and firms with no data on their productivity. Results suggest that the effect of high-productivity peers is larger also for firms in the reference group. At the same time, the additional effect of high-productivity peers is larger for high-productivity firms than for firms in the reference group. These results suggest that high-productivity firms can benefit more from the presence of high-productivity peers. Column (2) of Table 4 presents similar estimates with an alternative definition of the high productivity group, where we use the median productivity as the cutoff. Patterns are similar, but the effect of low-productivity peers is not significant any more.

Ownership: Column (3) of Table 3 shows estimates by ownership of the peers. The reference group is domestic-owned peers and peers without any information on ownership. The effect of same-building peers is significant for all types of peers, but the effects are considerably larger for foreign-owned peers.

Industry: Column (2) of Table A9 in the Appendix shows the heterogeneity in the estimated effects by the industry of the peers. We use peers without any information on their industry as a reference group. We find a similar same-building effect for peers in multiple industries (NACE groups D-G and J-K).

Product type: Table A10 of the Appendix classifies peers based on the type of the product the peer imported from the given country before. We use the product classification of Rauch to separate differentiated and reference-priced goods. The baseline category includes goods traded on an organized exchange and some non-classified goods. Results show that the experience of same-building neighbors in both differentiated and reference-priced goods matters, but the former has a somewhat stronger effect.

Table 4: Heterogeneous effect by the productivity of both the firm and the peers with country-specific experience

Sample: not yet importers until the previous year with data on productivity
Dependent variable: Importer

Definition of high-productivity:	top quartile (1)	above median (2)
Same-building importer neighbor	0.101***	0.045
	(0.0257)	(0.0308)
Same-building importer neighbor X High-productivity firm	0.292***	0.167**
	(0.0976)	(0.0767)
High-productivity same-building importer neighbor	0.134***	0.0495
	(0.0485)	(0.0394)
High-productivity same-building importer neighbor X High-productivity firm	0.507***	0.407***
	(0.184)	(0.106)
Firm-year FE	YES	YES
Country-year FE	YES	YES
Observations	3,778,517	3,778,517

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year and the firm has productivity data. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific import experience in the previous year, separately for high-productivity neighbors and also interacted with high-productivity firm indicators. High-productivity firms are defined as the ones with a 3-year average productivity above the 75th percentile of the 2-digit industry in column (1) and above the 50th percentile in column (2). The baseline firm group includes both low-productivity firms and firms having no productivity data. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

IV.B.3   Same-industry and same-product effects

After looking at the heterogeneity of the estimated effect both by the characteristics of the firms and the peers we check if import spillovers are specific for same-industry or same-product experiences.

Same-industry effects: We estimate same-industry effects by including separate indicators for experienced peers which operate in the same industry as the observed firm. We do this separately for each peer type. We also control for country-specific export and ownership experience but only present results for import experience. Column (1) of Table 5 shows that same-building peers have a stronger effect if they operate in the same industry as the firm. The estimated effect becomes more than four times higher for same-building neighbors. Still, it is important to note that peers in different industries also have a significant effect on import entry. As a robustness check we do the same exercise including only manufacturing firms. Column (2) shows that the baseline effects are robust, but somewhat weaker. Compared to the baseline hazard within manufacturing, effects have the same magnitude as the effects estimated for all firms.

Same-product effects: Columns (3)-(6) of Table 5 present estimates of our baseline specification with two modifications. First, it looks at not yet importer firms in a given product category. As an additional control variable we include an indicator for firm i having ever before imported goods in another product category from country c. Second, we include additional indicators for experienced peers having imported a good in the given product category from country c before. We call them same-product importers. The last four columns of Table 5 show our estimates by product categories, which we created based on BEC categories. Estimates are quite stable across product groups. Same-product importers tend to have a larger effect, but the effect of peers importing different products is also significantly positive.

Table A11 of the Appendix looks at the same-country and same-product experience effect using an alternative specification. We use the sample of firms which import for the first time from one of the four countries and haven't imported before from any of them. We call these firms first ever importers. We include these firms in a single year, when they started to import from one of the countries. We include all four countries for each of these firms as a separate observation, and also include separate observations for each of the four previously defined product categories. Then the estimation results show the probability of a firm starting to import a given product category from a given country, conditional on the firm starting to import from at least one of the countries and doing it for the first time. The observed patterns suggest that same-country and same-product importer peers increase the probability that the firm starts to import a specific product from a specific country.

IV.B.4   Other types of heterogeneity

Finally we identify other sources of heterogeneity in the estimated effect. We look at two aspects: the quality of experience the peer has and the number of experienced peers. We use alternative measures for the quality of experience: recent import in multiple years ('successful imports') and the total length of import experience.

Table 5: The effect of peers with country-specific experience on the probability of starting to import from the same country, separately for same-industry peers and peers importing the same product category

Sample: not yet importers until the previous year

Dependent variable: importer	same industry		same product			
	All firms	Manufacturing firms	Consumer goods	Industrial supplies	Capital goods	Parts and accessories
	(1)	(2)	(3)	(4)	(5)	(6)
Same-building importer neighbor	0.146***	0.381***	0.0372**	0.0186	0.0529***	0.0393***
	(0.0253)	(0.121)	(0.0188)	(0.0251)	(0.0144)	(0.0139)
Same-building importer neighbor with same industry/product	0.456***	0.775*	0.136***	0.155***	0.0728**	0.153***
	(0.0921)	(0.462)	(0.0307)	(0.0357)	(0.0288)	(0.0328)
Not yet importer from destination			YES	YES	YES	YES
Neighbors with export and owner experience	YES	YES				
Firm-year FE	YES	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES	YES
Observations	3,778,517	376,739	3,821,755	3,805,958	3,828,759	3,829,629
Baseline hazard:	0.25	0.56	0.11	0.15	0.07	0.07

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. Column (2) contains only manuducturing firms. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. In columns (3)-(6) only imports in the given product category are considered, both for creating the sample and defining the dependent variable. Products are categorized using the BEC classification. Consumer goods refer to BEC 1 and 6, industrial supplies refer to BEC 2 and 3, capital goods refer to BEC 41,51 and 52, parts and accessories refer to BEC 42 and 53. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. In columns (1) and (2) separate indicator variables show if there are experienced neighbors operating in the same 2-digit industry as the observed firm. In columns (3)-(6) separate indicator variables show if there are experienced neighbors which already imported the given product category. In columns (3)-(6) additional indicator variables are included for experienced neighbors importing a good in the regarded product category. In columns (1)-(2) controls for neighbors with country-specific export or ownership experience are also included. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Baseline hazard refers to the share of importers in the estimation sample. Results are presented as percentage points.

Successful importers: We repeat our baseline estimates using an alternative definition of importers and experienced peers: successful importers. We define a firm as a successful importer from country c in year t if it imports from country c at least in two years from the three-year period $[t-1, t+1]$. Column (3) in Table A12 of the Appendix shows that our main results are robust to this definition change for the firms starting to import.[8] Columns (1) and (2) show estimation results when we define an experienced peer as a successful importer from the country. In this way we both look at recent import experience and exclude one-time importers. Similar definitions apply for the export and ownership experience of peers. Our estimates show that a considerable fraction of the effect comes from successful importer peers. Columns (4) and (5) of the same table combine the two modifications and use both successful import entry and successful peers, leading to similar results.

Experience of the peers: We also check if firms can rather learn from peers with a longer import experience. As additional right-hand side variables we include the longest additional import experience above one year by peer group. Table A13 of the Appendix shows that the probability of starting to import from a country is significantly higher when the same-building peer which has already imported from that country imported for a longer period. Having peers in the same building with 3-4 years of experience doubles the effect compared to having peers with only one year experience. Results are robust to alternative definitions of the maximum length of experience in a peer group. As right-hand side variables we either include the number of years when the peer with the longest import experience in a given group imported from the country, or we only include recent continuous experience where we allow for single-year gaps in importing from the country, but stop counting the years of experience when there are two consecutive years without import.[9]

Number of peers: We also look at the additional effect of having more than one peer with country-specific import experience in a peer group. Assuming that the effect is linear in the number of experienced peers, instead of the indicators for having an experienced peer in a given peer group we use the number of experienced peers as right-hand side variables. Column (1) of Table 6 shows that increasing the number of experienced peers in the same building by one increases on average the probability of import entry by 0.2 percentage points. Column (2) of Table 6 presents similar results from a more flexible specification, in which we allow for a different effect of increasing the number of experienced peers from 0 to 1, from 1 to 2, or from 2 to 3. The estimated coefficients for higher number of neighbors are larger but also more noisy. As a result we cannot reject the assumption that the effect is linearly increasing with the number of experienced peers.

IV.C Magnitude and counterfactuals

Finally, we evaluate the importance of the estimated import spillovers from three aspects. First, we calculate social multipliers. Second, we compare our import spillover estimates to export spillovers which we estimate using the same data and the same identification strategy. Third, we compare the magnitude of import spillovers to changes in the probability of starting to import by the productivity of the firm.

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[8]In those specifications in which we use successful imports as the dependent variable, we consider the period $[t, t+2]$.

[9]As we don't know the import history of firms before 1992, there is a measurement error in the variable capturing the length of import experience. Neglecting this censoring problem is likely to bias our estimates towards zero. At the same time, experience obtained before the transition or in the early years after that might differ from the experience obtained later.

Table 6: The effect of the number of peers with country-specific experience on the probability of starting to import from the same country

Sample: not yet importers until the previous year
Dependent variable: Importer

|	(1)	(2)
Number of same-building importer neighbors	0.201*** (0.0273)	
>=1 same-building importer neighbor		0.173*** (0.0252)
>=2 same-building importer neighbors		0.188*** (0.0602)
>=3 same-building importer neighbors		0.46*** (0.136)
>=4 same-building importer neighbors		0.178 (0.21)
>=5 same-building importer neighbors		1.98 (2.01)
Firm-year FE	YES	YES
Country-year FE	YES	YES
Observations	3,778,517	4,414,638

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. In column (1) the right-hand side variables are the number of experienced peers in a given peer group. In column (2) right-hand side variables are indicators for the firm having at least X neighbors in the given peer group with country-specific import experience in the previous year. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Social multiplier: A way to capture the magnitude of the estimated effect is to calculate the social multiplier of a new import entry. We define the social multiplier as the expected additional number of firms starting to import from a given country due to the new import entry into the same country. For the calculations we impose the following simplifying assumptions: (1) Only experienced peers in the same building have an effect on the probability of starting to import from a country. (2) The estimated effect is linear in the number of experienced peers. (3) Both the baseline probability of starting to import and the estimated effect are constant over time and across countries and not affected by the size of the building. But we allow for a heterogeneous baseline probability by the productivity of the firm and a heterogeneous effect by the productivity of both the firm and the peer. We look at the 5-year social multiplier of making firm i which has not yet imported from country c start to import from c. We define the 5-year social multiplier as:

$$\frac{E(M_{a(i),c,5}|N^l_{a(i),0}, N^h_{a(i),0}, M^l_{a(i),c,0} + I_{g(i)=l}, M^l_{a(i),c,0} + I_{g(i)=h}) - E(M_{a(i),c,5}|N^l_{a(i),0}, N^h_{a(i),0}, M^l_{a(i),c,0}, M^l_{a(i),c,0})}{(1 - p_g - M^l_{a(i),c,0} * \beta_{gl} - M^h_{a(i),c,0} * \beta_{gh})^5},$$

(3)

where $M_{a(i),c,t}$ is the number of importers from country c on address a of firm i in year t, M^l is the number of low-productivity importers and N^l is the number of low-productivity firms in the building. Similarly, M^h is the number of high-productivity importers and N^h is the number of high-productivity firms. $I_{g(i)=h}$ is an indicator for firm i being low-productivity and $I_{g(i)=h}$ is an indicator for firm i being high-productivity. p_g is the baseline probability of starting to import for a firm in productivity group $g = \{low, high\}$ and β_{gl} and

Figure 2: The estimated 5-year social multiplier effect ordered by the size of the effect, using the sample of not-yet-importer firms in 2003
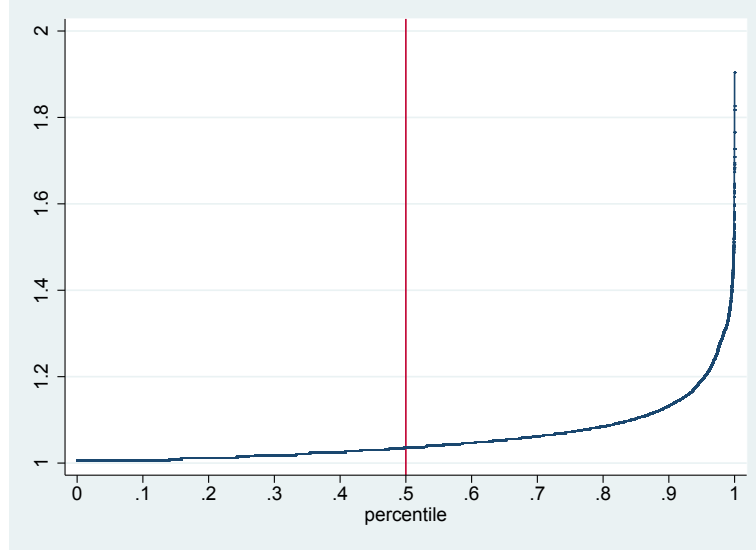
β_{gh} are the estimated effect of low-productivity and high-productivity peers on firms' import probability in productivity group g. The normalization is necessary to account for the fact that there is a certain probability with which firm i becomes an importer by year 5 anyways.

Based on our assumptions the number of importers in a building follows a Markov process, with a transition matrix depending on N^l and N^h, i.e. the number of low-productivity and high-productivity firms in the building. A state is defined by the M^l and M^h, i.e. the number of low-productivity and high-productivity importers in the building. For the counterfactual calculations we take all those firm-country pairs in 2003 which have not importer from the country before and have at least another non-importer firm from the country in the same building. Assuming no location changes in the following five years we calculate the 5-year social multiplier for eac of these firms. Table A18 of the Appendix presents the estimated heterogeneous effect by the productivity of both the firm and the peer, assuming a linear effect in the number of experienced peers. Figure 2 shows the calculated 5-year social multiplier for each firm, put in increasing order. The 90th percentile is around 1.14 and the median is 1.04. The figure suggests that compared to helping a random firm starting to import a policy targeting firms with a high spillover potential can considerably increase the social multiplier effect of a new importer. Targeting can be based on observable characteristics, like the size of the building the firm is located and firm productivity obtained using balance sheet data.

Import and export spillovers: Table A19 of the Appendix shows the results when we do the same estimates for exports. As before, the same type of experience has a higher effect, i.e. the effect of export experience on starting to export is higher than that of import experience, but also importer peers in the same-building and in owner-connected groups increase the probability of export entry to a specific country. The estimated coefficients of import and export spillovers are quite close to each other. The baseline hazard of starting to import is 0.00252, which is somewhat lower than the same number for exports, 0.00271. Same-building effect and owner-connected peers' effect with the same type of experience is relatively higher for import spillovers (85% and 203% of the baseline hazard) than for export spillovers (74% and 174% of the

baseline hazard). As opposed to import spillovers, spillovers from person-connected peers with experience in the same activity are significant for export entry.

Import spillovers and the effect of productivity: To get a sense of its magnitude, we benchmark our estimate by asking what increase in firm productivity would predict the same increase in the probability of importing. In our sample the probability of starting to import from a country is 0.19% for not-yet-importer firms in the lowest productivity quartile, 0.28% in the second quartile, 0.47% in the third quartile and 0.58% in the highest quartile. Consequently, the estimated import spillover effect of 0.21 percentage points is comparable to the predicted increase in the probability of importing as a firm moves from the second to the third productivity quartile.

V   Conclusion

In this paper we show evidence on import spillovers: firms learn to import from their peers. The effect of import spillovers is comparable to export spillovers. Controlling for ownership links we show that the presence of firms with country-specific import experience in the same-building almost doubles the probability of starting to import from a country, compared to the baseline probability. Spatial spillovers are highly localized. We also find a positive but lower effect for peers in the neighboring building. Additionally, peers with country-specific export experience or with owners from the given country also increase the probability of import entry. Larger, more productive and foreign-owned firms learn more. Firms learn more from a peer if it is larger, more productive, foreign-owned, operates in the same 2-digit industry or imports the same product category. Considering only spatial spillovers, we estimate that the five-year social multiplier effect of imports is about 1.14 for the 90th percentile and 1.04 for the median firm. This suggests considerable benefits from a targeted policy helping to import firms with a high spillover potential. An additional extension of the current analysis might be to repeat our estimations using more exotic countries and compare our findings for 'easy' and 'difficult' countries.

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Appendix

A Robustness checks

Ownership: We also check if our results are moved by firms being owned from one of the countries. Column (2) of Table A14 in the Appendix shows estimation results for a sub-sample of firms where we exclude those firms which have owners from any of the four countries. Results are robust for these changes.

Connecting person definition: We also use alternative definitions for people connection firms. Column (1) of Table A15 in the Appendix uses person-connected peers where the connecting people are those who have signing right both in their previous and in their new firms. Column (2) uses the broadest definition, in which person-connected peers can have any type of connections to either of the firms. As expected, these definitions increase the estimated effect of person-connected peers. Yet, reverse causality might be a problem biasing our estimates. Additionally, the effect of person-connected peers with export experience disappears in the alternative specifications. A potential explanation can be the relatively low number of person-connected peers with import or export experience. More importantly, the estimated effect of experienced peers in the other peer groups is not sensitive to changes in the definition of person-connected peers.

Changes in the sample: In our baseline specification we look at the effect of experienced peers on firms starting to import from a country for the first time. Table A16 of the Appendix shows estimation results when we define our estimation sample in a different way. Instead of an indicator for ever importing from country c up to year t, now we change the dependent variable to an indicator showing if a firm imports from a specific country in a specific year. Column (1) includes all firm-country pairs in all years. It answers the question whether a firm imports from a country in a year with a higher probability if it has peers with country-specific experience, irrespective of the firm's own import experience. Column (2) includes only those firms which start to import from one of the countries but never imported before from any of the four countries. Each of these firm is included only in one year, when it started to import from one of the countries. We include a separate observation for each of the four countries for each firm. This specification shows if a firm starts to import from a country with a higher probability if it had peers with country-specific experience last year, conditional on starting to import form at least one of the four countries. Column (3) is the closest to our baseline specification, but it excludes those firms entirely which already imported from at least one of the four countries. Patterns are similar in all three cases. Country-specific importer and owner experience of same-building neighbors, export experience of person-connected peers and import and export experience of ownership-connected peers has a robust effect on import probability. In column (1) also neighbor-building

and cross-street neighbors, as well as person-connected peers with import experience have a significant effect. Here the identification is less clear as firms might have their own experience, but the results might suggest that peers also play an important role in continuing imports. Column (4) includes experienced firms which have already imported form the country before, but which import at most once in the period $[t-2,t]$ where t is the current year. This can serve as a placebo check, as we expect that the effect of peers' experience is not considerable on such firms which have their own experience. Indeed, estimated coefficients are not significant, though estimates are noisy.

B Additional figures and tables

Figure A1: Industry composition of all firms and importers by destination, separately for new importers
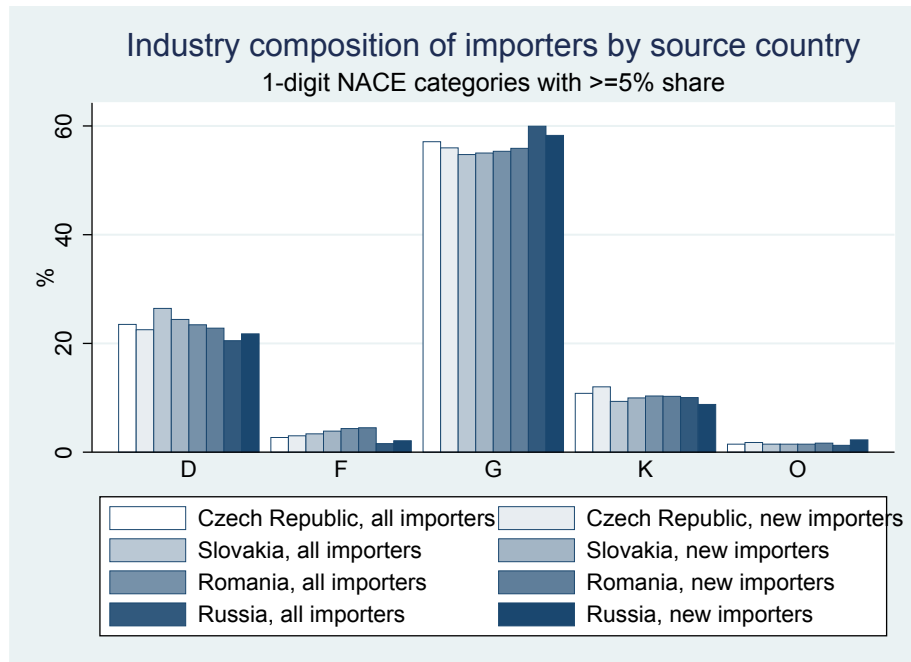
Figure A2: Industry composition of all firms and importers by destination, separately for new importers, manufacturing
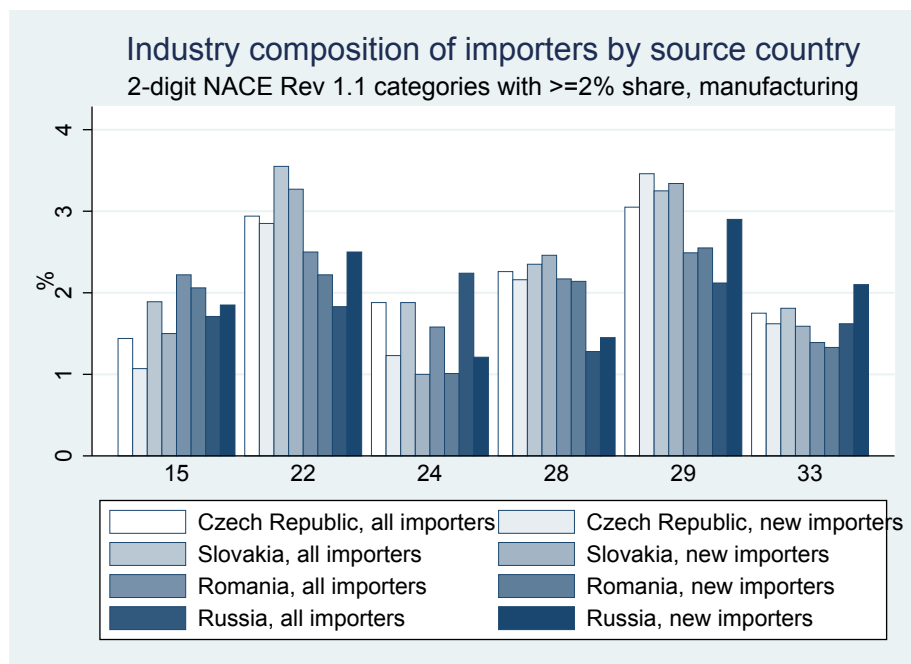

Figure A3: Industry composition of all firms and importers by destination, separately for new importers, trade and business
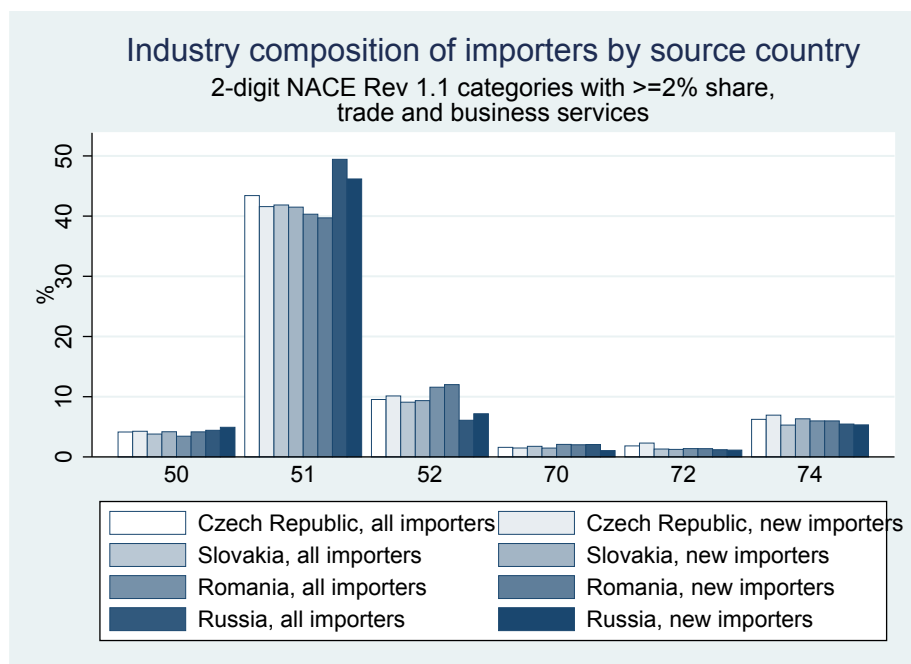
Table A1: Descriptive statistics, separately by the source country of importers

Sample: firms located in Budapest.

	All firms	All importers in 1994-2003 from				New importers in 1994-2003 from			
		Czech Republic	Slovakia	Romania	Russia	Czech Republic	Slovakia	Romania	Russia
Number of firms	212,859	5807	4534	3554	2010	4625	3411	2676	1349
Average age	5.4	8.1	8.2	8.0	8.3	5.6	5.6	5.9	5.9
Average employment	8.6	104	118	124	193	46	79	87	80
Average export share	0.04	0.12	0.12	0.15	0.21	0.12	0.12	0.14	0.20
Average log total factor productivity	2.85	2.48	2.47	2.43	2.43	2.51	2.53	2.41	2.53
Average labor productivity	2822	6754	5678	5200	6784	7012	6213	5457	7588
Share of foreign-owned	0.13	0.35	0.30	0.28	0.36	0.36	0.32	0.31	0.39
Share of state-owned	0.005	0.016	0.018	0.019	0.028	0.010	0.014	0.012	0.022
Distinct addresses	79,097	5403	4617	3689	2242	3534	2772	2248	1161
Number of import transactions by hs6		171,897	124,581	81,266	38,744				
- share of consumer goods (BEC 1, 6)		16%	12%	34%	8%				
- share of industrial supplies (BEC 2, 3)		39%	43%	44%	43%				
- share of capital goods (BEC 41, 51, 52)		15%	15%	9%	14%				
- share of parts and accessories (BEC 42, 53)		27%	28%	11%	34%				

Table A2: The yearly number of firms and importers per country

	Number of firms				
		already importing from			
year	total	Slovakia	Czech Republic	Romania	Russia
1992	38,342			363	168
1993	50,982	758	753	563	509
1994	63,592	1,225	1,175	754	675
1995	74,516	1,599	1,642	956	822
1996	86,702	1,905	2,029	1,127	937
1997	99,858	2,185	2,489	1,381	1,025
1998	113,366	2,410	2,916	1,631	1137
1999	122,407	2,588	3,304	1786	1,231
2000	133,031	2,784	3,683	2,018	1,292
2001	142,433	2,955	3,948	2,211	1,338
2002	148,574	3,095	4,207	2,382	1,365
2003	153,941	3,311	4,506	2,620	1,386

Table A3: The share of firms with different patterns of imports

	Share of firms importing	
	all imports	successful imports
from neither countries	95.02%	98.46%
only from the Czech Republic	1.26%	0.45%
only from Slovakia	0.79%	0.19%
only from Romania	0.83%	0.16%
only from Russia	0.40%	0.09%
only from the Czech Republic and Slovakia	0.61%	0.26%
only from the Czech Republic and Romania	0.18%	0.07%
only from the Czech Republic and Russia	0.09%	0.04%
only from Slovakia and Romania	0.11%	0.03%
only from Slovakia and Russia	0.05%	0.02%
only from Romania and Russia	0.05%	0.01%
from all countries but the Czech Republic	0.03%	0.01%
from all countries but Slovakia	0.04%	0.01%
from all countries but Romania	0.10%	0.04%
from all countries but Russia	0.25%	0.09%
from all countries	0.18%	0.06%

Successful imports: importing at least twice in a three-year long period

Table A4: The share of imported value in different BEC categories, firms grouped by the highest value BEC group in total imports

BEC caterory in which the firm imports the most	Average share of BEC category in the total yearly imported value				Number of firms
	1, 6	2, 3	42, 53	41, 51, 52	
1, 6	0.95	0.03	0.01	0.01	2,743
2, 3	0.02	0.96	0.01	0.01	4,019
42, 53	0.01	0.04	0.91	0.04	1,382
41, 51, 52	0.03	0.03	0.04	0.90	1,699
All firms	0.28	0.43	0.14	0.16	8,679

BEC 1, 6: Food and beverage, consumer goods; BEC 2, 3: Industrial supplies, fuels and lubricants; BEC 41, 51, 52: Capital goods, transport equipment; BEC 42, 53: Parts and accessories.

Table A5: The share of firms by the number of neighbors in the same and neighboring buildings

Number of peers (n)	Percent of firms in 2003 with n peers in		
	same building	neighbor building	cross-street building
0	22	31	50
1	13	14	12
2	9	8	7
3	7	6	5
4	6	5	4
5	5	4	3
6	5	4	3
7	4	3	2
8	3	3	2
9	3	3	2
10	2	2	1
more	19	16	10
Average number of peers	8.4	5.2	3.3

Table A6: The share of observations with different patterns of experienced neighbors, and the share of importers within each category

Time period: 1994-2003	Share of firm-year-country observations by neighbor categories		Share of observations in the neighbor category where the firm imports from the country	
	country-specific experience	experience about any of the four countries	country-specific experience	experience about any of the four countries
no neighbors	76.43%	58.06%	1.21%	1.09%
only export experience	6.01%	6.57%	2.16%	1.87%
only import experience	5.72%	5.79%	3.96%	2.37%
only owned from country	1.94%	4.02%	1.26%	1.09%
export and import, but no ownership	7.04%	13.91%	5.61%	3.90%
export and ownership, but no import	0.80%	2.00%	1.49%	1.19%
import and ownership, but no export	0.52%	1.71%	2.24%	1.77%
all three experience types	1.54%	7.94%	5.20%	3.34%
only geographic neighbors	19.14%	33.14%	2.81%	2.11%
only person-connected neighbors	0.47%	0.56%	9.40%	5.27%
only ownership-connected neighbors	2.31%	3.45%	5.91%	4.16%
geographic and person-connected neighbors, but no ownership-connected	0.19%	0.49%	11.90%	7.02%
geographic and ownership-connected neighbors, but no person-connected	1.28%	3.77%	8.67%	5.65%
person-connected and ownership-connected neighbors, but no geographic	0.11%	0.24%	15.69%	8.32%
all three types of connections	0.07%	0.30%	14.49%	8.86%

Table A7: The share of importers by the number of peers and importing peers in the same building, looking at some percentiles

Number of neighbors in same building	Share of importers	Number of observations
all neighbors		
0 (=p25)	1.40%	1,287,236
2 (=p50)	1.58%	506,844
6 (=p75)	1.71%	209,608
12 (=p90)	2.32%	70,356
importer neighbors		
0 (=p90)	1.41%	4,473,618
1 (=p95)	4.40%	267,858
2 (=p99)	6.79%	58,037

Unit of observation: firm-country-year

Table A8: The share of importers from a given destination with or without having neighbors with country-specific experience

Share of firms which start to import	Firm has neighbors with import experience in the same building		Firm has neighbors with import experience in neighboring building (+/-2)	
	only from country C	from any other country but C	only from country C	from any other country but C
only from country C	47.54%	18.33%	35.95%	21.90%
from any other country but C	52.46%	51.47%	64.05%	78.10%

Share of firms which start to import	Firm has neighbors with import experience in person-connected firms		Firm has neighbors with import experience in ownership-connected firms	
	only from country C	from any other country but C	only from country C	from any other country but C
only from country C	42.11%	19.83%	57.50%	14.95%
from any other country but C	57.89%	80.17%	42.50%	85.05%

Weighted average across the four countries, with the number of observations in a country as weights. Sample: firms starting to import from at least one of the countries and having at least one neighbor of the given type with import experience.

Table A9: The effect of peers with country-specific experience on the probability of starting to import from the same country, by the observed firm's and the peer's industry

Sample: not yet importers until the previous year

Dependent variable: importer	Grouped by industry of the	
	firm (1)	neighbor (2)
Same-building importer neighbor x Industry A-C	-0.203 (0.284)	0.024 (0.198)
Same-building importer neighbor x Industry D	0.515*** (0.117)	0.296*** (0.0686)
Same-building importer neighbor x Industry E-F	0.158 (0.105)	0.261** (0.132)
Same-building importer neighbor x Industry G	0.605*** (0.0864)	0.236*** (0.0513)
Same-building importer neighbor x Industry H-I	0.202** (0.0978)	-0.00162 (0.108)
Same-building importer neighbor x Industry J-K	0.0987*** (0.0364)	0.224*** (0.0698)
Same-building importer neighbor x Industry L-Q	0.0966* (0.0544)	0.144 (0.144)
Firm-year FE	YES	YES
Country-year FE	YES	YES
Nr. of observations	3,778,517	3,778,517

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific import experience in the previous year. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. Industry X dummy in the interaction terms refers to the observed firm operating in industry X in column (1) and having a peer from the specific industry in column (2). All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table A10: The effect of peers with country-specific experience on the probability of starting to import from the same country, by the type of the good the peer imported

Sample: not yet importers until the previous year Dependent variable: Importer	(1)
Same-building importer neighbor	-0.0263
	(0.0607)
Same-building importer neighbor importing differentiated good	0.23***
	(0.0598)
Same-building importer neighbor importing reference-priced good	0.19***
	(0.0579)
Neighbors with export and owner experience	YES
Firm-year FE	YES
Country-year FE	YES
Observations	3,778,517

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. Separate indicators are included for experienced neighbors importing differentiated or reference-priced goods. Goods are categorized following the classification of Rauch. Controls for neighbors with country-specific export or ownership experience are also included. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table A11: The effect of peers with country-specific experience on the probability of starting to import a certain type of product from the same country conditional on importing from all four countries for the first time, separately for peers importing the same product type

Sample: first ever importers Dependent variable: Importer	(1)
Same-building importer neighbor	-5.6***
	(1.87)
Same-building same-product importer neighbor	16.1***
	(1.85)
Firm-year FE	YES
Country-year FE	YES
Observations	3,821,755

Sample: firms with all four countries in the year the firm started to import from the first of the four countries. The unit of observation is firm-country-year-product category. Using the BEC classification 4 product categories are created: consumer goods (BEC 1, 6), industrial supplies (BEC 2, 3), capital goods (BEC 41,51, 52) and parts and accessories (BEC 42 and 53). The dependent variable is an indicator for the firm importing the given product type from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific import experience in the previous year. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. Separate indicator variables are included for experienced neighbors importing a good in the regarded product category. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table A12: The effect of peers with country-specific experience on the probability of starting to import from the same country, looking at successful entry and the effect of successful peers separately

Sample: not yet importers until the previous year

Dependent variable:	Imports in t		Imports twice in [t,t+2]		
	(1)	(2)	(3)	(4)	(5)
Same-building importer neighbor	0.173***		0.0743***	0.0491**	
	(0.0263)		(0.0198)	(0.0197)	
Same-building successful importer neighbor	0.244***	0.341***		0.146***	0.174***
	(0.0533)	(0.0521)		(0.0448)	(0.044)
Neighbors with export and owner experience	YES	YES	YES	YES	YES
Firm-year FE	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES
Observations	3,778,517	3,778,517	3,051,413	3,051,413	3,051,413
Baseline hazard	0.25	0.25	0.1	0.1	0.1

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable in columns (1)-(2) is an indicator for starting to import in the given year. The dependent variable in columns (3)-(5) is an indicator for starting to import successfully, i.e. the variable is 1 if the firm imports from the country at least twice in the period [t,t+3] where t is the current year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year. A successful importer neighbor refers to a peer importing from the country at least twice in the period [t-2,t]. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. Controls for neighbors with country-specific export or ownership experience are also included. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Baseline hazard refers to the share of importers (columns (1)-(2)) or successful importers (columns (3)-(5)) in the estimation sample. Results are presented as percentage points.

Table A13: The effect of the length of peer experience on the probability of starting to import from the same country

Sample: not yet importers until the previous year
Dependent variable: Importer

Specification:	Total number of years (1)	Number of recent years (2)
Same-building importer neighbor	0.171***	0.14***
	(0.0272)	(0.0269)
Longest additional import experience of same-building importer neighbors	0.0612***	0.0687***
	(0.0141)	(0.0118)
Firm-year FE	YES	YES
Country-year FE	YES	YES
Observations	3,778,517	3,778,517

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific import experience in the previous year, and the length of additional import experience in number of years. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. Length of the peers' import experience is measured in column (1) using all years when the peer imported from the country. Column (2) uses only recent countinuous experience, allowing for single-year gaps in the import history of the peers, but counting only the number of years with actual import. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table A14: The effect of peers with country-specific experience on the probability of starting to import from the same country, robustness checks

Sample: not yet importers until the previous year
Dependent variable: Importer

	Linked firms not excluded (1)	No owner from the 4 countries (2)
Cross-street exporter neighbor	-0.0257 (0.0254)	-0.0161 (0.0234)
Neighbor-building exporter neighbor	0.0707*** (0.0271)	0.0327 (0.0206)
Same-building exporter neighbor	0.0453 (0.0288)	0.0218 (0.0218)
Person-connected exporter neighbor	0.353*** (0.117)	0.23** (0.101)
Owner-connected exporter neighbor		0.125*** (0.0407)
Cross-street importer neighbor	0.0254 (0.0267)	0.0364 (0.0248)
Neighbor-building importer neighbor	-0.0121 (0.0261)	0.0394* (0.0208)
Same-building importer neighbor	0.204*** (0.0362)	0.21*** (0.0264)
Person-connected importer neighbor	0.482*** (0.129)	0.0921 (0.0917)
Owner-connected importer neighbor		0.508*** (0.0496)
Cross-street neighbor owned from the country		0.0213 (0.0289)
Neighbor-building neighbor owned from the country		-0.0149 (0.0201)
Same-building neighbor owned from the country		0.0281 (0.0264)
Person-connected neighbor owned from the country		0.0646 (0.178)
Ownership-connected neighbor owned from the country		-0.118 (0.0746)
Firm-year FE	YES	YES
Country-year FE	YES	YES
Nr. of observations	1,340,498	3,718,711

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. Column (1) doesn't control for country-specific experience of firms in the same ownership network, and doesn't exclude firms with ownership links from spatial and person-connected neighbors. Column (2) excludes those firms from the regression which have owers from any of the four countries. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year. An exporter or importer neighbor refers to a peer with country-specific export or import experience. A neighbor owned from the country refers to a peer who ever had an owner from the given country. Same building refers to the building of the firm, cross-street refers to building number +/-1 and neighbor building refers to building number +/-2. Person-connected neighbor refers to a peer which had a manager who became an owner in the firm of interest. Ownership-connected neighbor refers to a peer in the same ownership network. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table A15: The effect of peers with country-specific experience on the probability of starting to import from the same country, using different definitions for people connecting firms

Sample: not yet importers until the previous year

Dependent variable: Importer	Connecting person definition	
	any connection	signing right in both firms
	(1)	(2)
Cross-street exporter neighbor	-0.0173	-0.0173
	(0.023)	(0.023)
Neighbor-building exporter neighbor	0.0342*	0.0343*
	(0.0204)	(0.0204)
Same-building exporter neighbor	0.0251	0.025
	(0.0218)	(0.0218)
Person-connected exporter neighbor	-0.00294	0.071
	(0.057)	(0.0843)
Owner-connected exporter neighbor	0.136***	0.136***
	(0.0403)	(0.0403)
Cross-street importer neighbor	0.0317	0.0314
	(0.0244)	(0.0244)
Neighbor-building importer neighbor	0.0387*	0.0389*
	(0.0204)	(0.0204)
Same-building importer neighbor	0.212***	0.212***
	(0.0259)	(0.0259)
Person-connected importer neighbor	0.268***	0.423***
	(0.0604)	(0.094)
Owner-connected importer neighbor	0.507***	0.508***
	(0.0491)	(0.0491)
Cross-street neighbor owned from country	0.0223	0.0222
	(0.0289)	(0.0289)
Neighbor-building neighbor owned from country	-0.0187	-0.0189
	(0.0201)	(0.02)
Same-building neighbor owned from country	0.0561**	0.0558**
	(0.0261)	(0.0261)
Person-connected neighbor owned from country	0.171	0.233
	(0.177)	(0.287)
Ownership-connected neighbor owned from country	-0.0449	-0.0432
	(0.0693)	(0.0693)
Firm-year FE	YES	YES
Country-year FE	YES	YES
Nr. of observations	3,778,517	3,778,517

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year. An exporter or importer neighbor refers to a peer with country-specific export or import experience. A neighbor owned from the country refers to a peer who ever had an owner from the given country. Same building refers to the building of the firm, cross-street refers to building number +/-1 and neighbor building refers to building number +/-2. Person-connected neighbor refers to a peer which had a manager who became an owner in the firm of interest. Column (1) uses managers with any connections to both firms (signing right, supervisory board or ownership). Column (2) uses those managers who have signing right in both firms. Ownership-connected neighbor refers to a peer in the same ownership network. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table A16: The effect of peers with country-specific experience on the probability of importing from the same country, using alternative samples

Dependent variable: imports that year

Sample:	all firms	first ever importers	not yet importers	importers, but not recently
	(1)	(2)	(3)	(4)
Cross-street exporter neighbor	-0.0566	-0.159	0.00147	1.44
	(0.0695)	(2.61)	(0.02)	(5.63)
Neighbor-building exporter neighbor	0.024	4.3*	0.0349**	-0.897
	(0.0507)	(2.36)	(0.0168)	(4.31)
Same-building exporter neighbor	0.0896*	1.59	0.025	1.16
	(0.0523)	(1.85)	(0.0187)	(2.95)
Person-connected exporter neighbor	0.723**	14***	0.217**	1.31
	(0.291)	(4.57)	(0.0933)	(10.1)
Owner-connected exporter neighbor	0.57***	6.99***	0.106***	2.98
	(0.107)	(2.59)	(0.0373)	(3.79)
Cross-street importer neighbor	0.173**	0.249	0.00803	-1.2
	(0.0695)	(2.7)	(0.0203)	(5.77)
Neighbor-building importer neighbor	0.0707	1.72	0.0203	-2.15
	(0.054)	(2.37)	(0.0177)	(4.81)
Same-building importer neighbor	0.766***	8.82***	0.159***	0.799
	(0.0765)	(1.85)	(0.0224)	(2.99)
Person-connected importer neighbor	4.78***	5.63	0.0942	-1.02
	(0.435)	(6.49)	(0.0822)	(12.4)
Owner-connected importer neighbor	2.08***	22***	0.43***	2.2
	(0.146)	(2.71)	(0.0456)	(3.68)
Cross-street neighbor owned from country	0.0288	4.26	0.0101	5.61
	(0.0841)	(4.14)	(0.025)	(9.19)
Neighbor-building neighbor owned from country	0.136***	-4.93	-0.0211	0.785
	(0.0476)	(3.66)	(0.0172)	(8.89)
Same-building neighbor owned from country	0.317***	11.2***	0.0533**	-0.223
	(0.0732)	(3.48)	(0.0225)	(5.44)
Person-connected neighbor owned from country	1.16	15.5	0.157	40.6***
	(0.71)	(22.2)	(0.194)	(14.4)
Ownership-connected neighbor owned from country	0.585**	6.44	-0.0163	2.6
	(0.241)	(7.4)	(0.0599)	(8.46)
Firm-year FE	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES
Nr. of observations	3,845,272	23,404	3,663,512	49,639

Sample in column (1): all firm-country pairs in all years; in column (2): firms with all four countries in that year when the firm started to import for the first time from one of the four countries; in column (3): firms with all four countries in those years when the firm has not imported from any of the countries until the previous year; in column (4): firm-country pairs in those years when the firm has already imported from the country before but the firm imports at most once in the period [t-2;t] where t is the current year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year. An exporter or importer neighbor refers to a peer with country-specific export or import experience. A neighbor owned from the country refers to a peer who ever had an owner from the given country. Same building refers to the building of the firm, cross-street refers to building number +/-1 and neighbor building refers to building number +/-2. Person-connected neighbor refers to a peer which had a manager who became an owner in the firm of interest. Ownership-connected neighbor refers to a peer in the same ownership network. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table A17: Descriptive statistics for the number of addresses and firms having a mover and having no previous country-specific import experience

	Number of		
	address-year pairs	address-year-country triplets	affected firms
Total	538,018	2,152,076	212,859
With a mover	58,397	233,588	105,214
With a mover having previous import experience	3,683	5,424	18,163
... from Slovakia	1,584	1,584	8,907
... from the Czech Republic	1,966	1,966	11,362
… from Romania	1,081	1,081	6,696
… from Russia	793	793	4,798
Without any import experience from a country in t and t-1, apart from the mover in t			
... total	376,496	1,417,228	184,978
... also having a mover	31,757	109,816	87,754
... also having an experienced mover	1,575	2,092	8,951

Affected firms denote those firms which are on a given type of address, excluding the movers themselves, except from the total number of firms. A mover is defined as a firm changing its address within Budapest from one year to another. An address without any import experience means that all the firms being present in the same or neighboring buildings in years t-1 or t are without import experience from the country up to that year. The only exceptions might be the movers relocating to the address in year t.

Table A18: Heterogeneous effect by the productivity of both the firm and the peers with country-specific experience, allowing for an increasing effect in the number of peers

Sample: not yet importers until the previous year with data on productivity
Dependent variable: Importer

	(1)
Number of low-productivity same-building importer neighbors X Low-productivity firm	0.122**
	(0.0491)
Number of high-productivity same-building importer neighbors X Low-productivity firm	0.16***
	(0.0371)
Number of low-productivity same-building importer neighbors X High-productivity firm	0.314***
	(0.0721)
Number of high-productivity same-building importer neighbors X High-productivity firm	0.736***
	(0.126)
Firm-year FE	YES
Country-year FE	YES
Observations	3,778,517

Sample: firm-country pairs in those years when the firm has not imported from the country until the previous year and the firm has productivity data. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm importing from the country in the given year. Right-hand side variables are the number of low- or high-productivity experienced importers in a given peer group, also interacted by an indicator for the productivity group the firm of interest belongs to. High-productivity firms are defined as the ones with a 3-year average productivity above the 75th percentile of the 2-digit industry. The low-productivity firm group also includes firms having no productivity data. Only coefficients on same-building peers are presented, but the regressions also include the effect of all other types of peers. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.

Table A19: The effect of peers with country-specific experience on the probability of starting to export to the same country

Sample: not yet exporters until the previous year
Dependent variable: Exporter

	(1)	(2)	(3)	(4)	(5)
Cross-street exporter neighbor	0.0413 (0.0256)			0.041 (0.0255)	0.0463* (0.0256)
Neighbor-building exporter neighbor	0.0396** (0.0196)			0.0389** (0.0195)	0.0371* (0.0201)
Same-building exporter neighbor	0.172*** (0.0246)			0.17*** (0.0246)	0.159*** (0.0248)
Person-connected exporter neighbor		0.305*** (0.0915)		0.277*** (0.0912)	0.257*** (0.0911)
Owner-connected exporter neighbor			0.493*** (0.0486)	0.488*** (0.0485)	0.471*** (0.0487)
Cross-street importer neighbor					-0.0274 (0.0251)
Neighbor-building importer neighbor					0.00981 (0.0182)
Same-building importer neighbor					0.0458** (0.023)
Person-connected importer neighbor					0.136 (0.109)
Owner-connected importer neighbor					0.0879** (0.043)
Cross-street neighbor owned from country					-0.0126 (0.0302)
Neighbor-building neighbor owned from country					-0.00554 (0.0222)
Same-building neighbor owned from country					0.0569* (0.0295)
Person-connected neighbor owned from country					0.627 (0.387)
Ownership-connected neighbor owned from country					0.11 (0.0783)
Firm-year FE	YES	YES	YES	YES	YES
Country-year FE	YES	YES	YES	YES	YES
Nr. of observations	3,772,739	3,772,739	3,772,739	3,772,739	3,772,739

Sample: firm-country pairs in those years when the firm has not exported to the country until the previous year. The unit of observation is firm-country-year. The dependent variable is an indicator for the firm exporting to the country in the given year. Right-hand side variables are indicators for the firm having different types of neighbors with country-specific experience in the previous year. An exporter or importer neighbor refers to a peer with country-specific export or import experience. A neighbor owned from the country refers to a peer who ever had an owner from the given country. Same building refers to the building of the firm, cross-street refers to building number +/-1 and neighbor building refers to building number +/-2. Person-connected neighbor refers to a peer which had a manager who became an owner in the firm of interest. Ownership-connected neighbor refers to a peer in the same ownership network. All specifications include firm-year and country-year fixed effects. Standard errors in parentheses are clustered by building. Results are presented as percentage points.