Made in Africa

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Firms tend to concentrate in clusters and cities, drawn by the markets they serve, the products and services they produce, and the skills they require. In France, the United Kingdom, and the United States, 75 to 95 percent of industry is clustered or concentrated relative to overall economic activity.1 Firms in low- and middle-income countries show similar tendencies toward geographical concentration. More than half of the large-scale industrial firms in Tunisia are located in only two geographical areas. In Vietnam, villages in ancient times concentrated on producing individual products such as wooden furniture or ceramics, and today large firms are surrounded by literally tens of thousands of small enterprises in two major industrial clusters near Hanoi and Ho Chi Minh City. In Cambodia, manufacturing and service firms cluster near major cities. In Africa, the Suame Magazine near Kumasi, Ghana, is home to thousands of small metalworking firms, such as lathe turners, welders, and casting foundries.

Agglomeration economies are the productivity benefits that come when firms locate near one another. The motivations for and the benefits of agglomeration have been recognized and studied at least since the time of Alfred Marshall.\(^2\) Recent theoretical and empirical research has helped us to understand better the nature of agglomerations and their role in the industrialization process. In this chapter we are mainly interested in understanding how industrial agglomeration impacts firm-level productivity in poor countries. This is important because virtually all of the evidence we have on agglomeration comes from countries with middle and higher incomes. Thus, in Learning to Compete (L2C) we attempted to undertake a number of careful econometric studies of the relationship between geographical concentration and firm-level productivity.

We begin by defining what agglomeration economies are. Then we turn our attention to some of the ways the spatial concentration of industry has evolved in our sample of African and emerging Asian countries. The chapter briefly describes how the urbanization of industry is taking place in Africa, based on our country case studies. Following that, we present new evidence—to our knowledge the first of its kind—on the relationship between spatial concentration and the productivity of firms in low-income countries. We wrap up by discussing how agglomerations, capabilities, and competition are interrelated.

**Understanding Agglomeration**

Broadly speaking, agglomeration economies come from two sources: localization (i.e., proximity to producers of the same commodity or service) and urbanization (i.e., proximity to producers of a wide range of commodities and services). At the risk of simplification, localization economies are the forces that drive the formation of industrial clusters, while urbanization economies are the forces that

\(^2\) Marshall (1920).
help drive the formation of cities. The Suame Magazine and the Arusha furniture cluster are examples of agglomerations driven by localization economies. The world’s megacities are the extreme expression of urbanization economies.

Localization Economies and Industrial Clusters

Beginning with Marshall, economic geographers have argued that the proximity of firms in similar or related activities can lead to a number of localized external economies. Geographic concentration helps to broaden the market for input suppliers, allowing them to exploit economies of scale in production. A large localized market permits suppliers to provide specialized goods and services tailored to the needs of their buyers. Proximity may also help to ensure timely delivery, lower inventory costs, and enhanced quality. The result is higher profits for upstream firms accompanied by easier access to a broader range of inputs for their customers.

“Thick” labor markets expand the range of skills available to employers and facilitate better matching to their distinctive needs. Workers with skills specialized in a sector will be attracted to areas where employment in the sector is high, relative to the total labor force. The density of employment reduces search costs and provides a measure of insurance against unemployment. Similarly, firms will be attracted to areas where there are a large number of workers (or managers) with skills relevant to their industry. Location in a large labor market also makes it easier to find specialized labor, such as designers, engineers, and consultants.

Concentration makes it more likely that workers and entrepreneurs will learn from each other. When firms in the same industry are located close to one another, it is easier to monitor what the neighbors do and learn from their successes and mistakes. Workers and managers may move across firms, facilitating knowledge spillovers. Closeness to competitors in the same sector also allows firms to stay abreast of market information. Collective action through intra-cluster cooperation between firms can help overcome common
constraints such as information failures or weak contract enforcement, leading to efficiency gains for all firms within clusters.\textsuperscript{3} Industrial concentrations in low-income countries attract specialized trading firms, including those engaged in international trade, that benefit small and medium firms trying to break into new markets.\textsuperscript{4}

Case studies provide evidence that when upstream and downstream firms in a particular industry and the institutions associated with them—for example, universities and trade associations—cluster together, competitive pressures force firms to innovate or fail.\textsuperscript{5} Since a firm’s competitors are by definition within its own industry, this is a localization effect. This is clearly the story of Silicon Valley, centered on Stanford University and close to the University of California at Berkeley. The province of Penang in Malaysia provides a middle-income country illustration. The electronics cluster in Penang has evolved from simple assembly operations to integrated electronics manufacturing and product innovation. In part, this evolution was due to the active role played by universities and public-private partnerships aimed at upgrading the industry.\textsuperscript{6}

Evidence suggests that spatial concentration varies with the level of sophistication of the industry. It is more pronounced in high-skill and high-technology industries—electronics, computing machinery, process control instruments, semiconductors, and pharmaceuticals—than light industries such as footwear and textiles. In the United States, for example, electrical and electronic equipment and transport equipment tend to be more concentrated than metal products, machinery, and equipment manufacturing.\textsuperscript{7} In Korea, heavy and transport industries (e.g., metals, chemicals, and transport equipment) tend to be found in a few highly specialized cities, while traditional or light industries (e.g., food and textiles) are more spatially dispersed.\textsuperscript{8}

Localization effects can be powerful, even for simple products. The Nnewi automotive parts cluster in Nigeria is home to some eighty-five firms that manufacture and export automotive parts, primarily to West Africa. Nnewi became a hub for local traders in automotive parts in the 1970s. When the traders began importing machinery, mainly from Taiwan, a vibrant cluster of manufacturers of automotive parts emerged. The key to its success was the transfer of technology through the training of Nigerian technicians in the new technologies acquired from Taiwan and a focus on learning by doing and on-the-job training. A successful apprenticeship program and a long history of cooperation among traders in the community assisted in this flow of knowledge. Of particular note is the fact that the Nnewi cluster thrived despite major infrastructure and credit constraints and little by way of government support. Electricity and water, for example, were provided through private generators and boreholes paid for by the firms themselves. Business associations such as the Nnewi Chamber of Commerce, Industry, Mines, and Agriculture and the Nigerian Association of Small Scale Industries played an important role in the organization of enterprises within the cluster.

In Arusha, Tanzania, 234 furniture manufacturing firms are found in four subclusters surrounding the city. The industry has been growing rapidly since about 2000, serving mainly local demand from residential housing and from the hotel and construction industries. Proximity to the heavy traffic along the Nairobi-Moshi international road brings a large number of potential customers into the area. The cluster consists of small furniture workshops and specialist woodcutting, planing, and shaping firms that work on contract to the furniture makers. The furniture workshops purchase raw lumber and consign it to the specialist subcontractors for cutting and shaping to specifications. The components are then brought back to the workshops for assembly and finishing. Once the furniture is made, it is usually the customer who picks it up and transports it.

The division of production between the workshops and the specialist subcontractors is an outcome of the downstream firms’ efforts to avoid the large (to them) and indivisible investments associated with purchasing woodworking machinery and to mitigate the production risks associated with variable electrical power. Two vocational and technical institutions, Arusha Technical College (ATC) and the Vocational Training and Service Centre (VTSC), are located in the Arusha area. Both institutions train carpenters for the industry in the area, providing a thicker labor market for workers with the relevant skills.\textsuperscript{11}

Originating in the 1930s (at the site of an old colonial army depot called the “Magazine”), the Suame Magazine is an example of successful spontaneous agglomeration of smaller enterprises. Its location near the most important junction of the artery roads connecting the major cities in Ghana proved a natural magnet for auto repair shops and their parts suppliers. In the early 1980s, the government realized the potential of the industrial cluster and established a training institution (the Intermediate Technology Transfer Unit) to facilitate technology upgrades by the most promising entrepreneurs. Today, Suame Magazine is the largest artisan engineering cluster in sub-Saharan Africa. It is possibly the largest light manufacturing cluster in Africa, covering over 900,000 square meters with approximately 10,000 smaller enterprises and employing more than 100,000 workers with higher technical skills than any other industrial cluster in West Africa. Most of these firms are engaged in automobile repair services (i.e., garages), automobile parts production, retail sales of autos, and different types of metal processing.\textsuperscript{12}

\textit{Urbanization Economies and Cities}

In economies at all levels of income, cities contain a high proportion of manufacturing and services firms. In Vietnam the major industrial clusters are located in and near the two main urban cen-

\textsuperscript{11} Muto and others (2011).
\textsuperscript{12} Iddrisu, Mano, and Sonobe (2012).
Industrial Clusters

In Ghana and Uganda, the majority of firms are found in and near the capital. Cities often are the hosts to several different industrial clusters, as in Tunisia.

Urbanization economies come mainly from between-industry interactions. Unrelated firms in the same city can become more productive for a number of reasons. Urban diversity fosters the exchange of ideas and technology. Firms in different industries can share indivisible facilities—such as infrastructure—or public goods. Cities offer a wider variety of intermediate input suppliers and a larger pool of narrowly specialized workers. Co-location stimulates the growth of specialist services, such as legal, software, data processing, advertising, and management consulting firms. These firms provide a thicker labor market for highly educated individuals.

As local market scale increases, firms are more likely to outsource their service functions to local suppliers. This outsourcing further encourages competition and diversity in the local business services market. Firms also gain from the generation and diffusion of knowledge that is not specific to their industry, often through universities and research organizations. These urbanization effects appear to become more important in more sophisticated industries. There is some evidence from Korea that greater diversity of firms in an agglomeration raises productivity in high-technology industries. This is not the case for more standardized, light industries such as food, textiles, and apparel.\(^\text{13}\)

Evidence of the importance of urbanization economies for productivity comes primarily from developed countries. A consensus view is that doubling city size is associated with a productivity increase of some 4 to 8 percent. This is a large effect. Moving from a city of 100,000 workers to one of 3 million would increase productivity by about a third.\(^\text{14}\) These urbanization effects may be even more powerful in poorer countries. China is one of few developing countries for which we have evidence on urbanization effects. Au and Henderson estimate that moving from a Chinese city of 100,000

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workers to one of 1.3 million workers raises productivity by 80 percent.\textsuperscript{15}

The limited evidence available suggests that the relative importance of localization and urbanization economies changes as countries grow richer. Localization economies predominate at low levels of development, as firms related along a value chain learn from each other. As incomes grow, urbanization economies seem to become more important. Of course, both localization and urbanization economies can be present at the same time in the same place. The Suame Magazine and the furniture cluster in Arusha are industrial clusters of micro, small, and medium-scale firms within cities. It appears, however, that firms in the cluster benefit primarily from localization economies.

\textbf{Industrial Clustering in Africa and Emerging Asia}

Our studies of agglomeration in four countries (Cambodia, Ethiopia, Tunisia, and Vietnam) offer some richer details of the way in which markets, transportation costs, and agglomeration effects shape the spatial distribution of firms in low-income countries. Ethiopia is the poorest country among those we studied. Its large size, combined with the poor state of infrastructure, make transport costs high. For this reason firms tend to concentrate in population centers, mainly market towns.

The Ethiopian Industrial Survey data, to which we referred in chapter 4, gives a detailed picture of the distribution of industry across space in Ethiopia. Manufacturing firms are present in all the large urban centers of the country, and there is a relatively high concentration of manufacturing production in the capital city, Addis Ababa, and its neighboring areas. Because Ethiopia is landlocked, exporting firms tend to be located near to access corridors such as the airport at Addis Ababa and the Djibouti rail corridor. Firms producing for final consumption are more spatially diversified. These

\textsuperscript{15} Au and Henderson (2006).
firms operate in highly localized markets, which bring with them substantial competitive pressures.\textsuperscript{16}

Cambodia is also a poor country in which infrastructure remains poorly developed and transport costs are high, leading—as in Ethiopia—to a significant amount of clustering of economic activity. We used firm-level data for Cambodia covering over 500,000 enterprises in both manufacturing and services in the formal and informal economy to get a picture of the spatial pattern of economic activity.\textsuperscript{17} The highest density of firms is in provinces along Tonle Sap Lake and in Phnom Penh and its surrounding province, as well as in the southern provinces where the population density is also highest. There are very few firms located in the northeast, northern, and southwestern regions of Cambodia. The spatial distribution of employment closely matches the spatial distribution of firms. The largest establishments, however, are mostly located in the urban centers.

Although the main purpose of our research in Cambodia was to try to understand the impact of agglomeration on firm-level productivity (which we shall discuss later in this chapter), we were also able to tease out some interesting spatial patterns. Most firms in Cambodia are informal and in the service sector. For this reason we thought it important to see if clustering appeared to affect formal and informal firms differently and if manufacturing and services firms responded in the same way to spatial concentration. We found that, in general, the effects of clustering were the same in formal (registered) and informal (unregistered) firms. We also found that while all firms were more productive in more populated clusters, manufacturing firms appeared to derive less benefit than service firms from more populous agglomerations. This may be due to the fact that most service firms need to locate close to their customers, and there are naturally more potential customers in areas of high population and economic activity.

Manufacturing firms in Vietnam are highly clustered. There are two main industrial agglomerations anchored by large firms, one

\textsuperscript{16} Siba and others (2012).
\textsuperscript{17} Chhair and Newman (2014).
located in the north near Hanoi and another in the south near Ho Chi Minh City. Over the past decade new and smaller clusters have begun to appear along the coast in eastern south-central Vietnam. These new clusters appear to be the result of smaller firms clustering around individual large firms. Very few small manufacturing firms in Vietnam are located away from clusters. In contrast, while most medium firms are located in clusters, some are also in seemingly random locations around the country.

Most research on agglomerations takes clustering as a given and makes no attempt to measure its extent, so one question we asked in Vietnam was to what extent industrial concentration was significant. To do this we used the tools of network analysis to measure the extent of clustering. We found that manufacturing enterprises were in fact highly spatially concentrated and that this clustering was not driven by institutional factors such as zoning or location restrictions on firms. Our results further revealed that there was significant clustering outside of Vietnam’s well-known Special Economic Zones. When we attempted to determine the effect of population density on the locational choice of firms, we got a result that is consistent with the view that localization economies matter more than urbanization for a country at Vietnam’s per capita income and level of industrial sophistication. We found that population density alone was not driving the high degree of clustering we see in Vietnam.

Industry in Tunisia—the highest income economy among the countries studied—is also highly spatially concentrated. Historically, the coastal regions have been the center of economic activity and the western interior has lagged. The degree of industrial concentration grew dramatically between 1995 and 2010. In 2010, two governorates—Tunis, the capital, and Sfax on the northeast coast—held 16.1 percent and 19.4 percent of the total number of manufacturing firms, respectively. In contrast, sixteen governorates out of a total of twenty-four had less than 3 percent of the total number of firms. Tunisia’s spatial distribution by type of manufacturing supports the notion that even for middle-income countries, localization

economies predominate. More than 30 percent of textile firms are concentrated in Monastir governorate and more a third of chemical firms are in Tunis. Agro-food firms are mainly located in Sfax. Exporting sectors (electronic, textile, and chemical) are concentrated in the littoral regions. Only products associated with local markets are more diversified spatially.\textsuperscript{19}

\textbf{Urbanization and Industry in Africa}

Our country studies of Ghana, Mozambique, Senegal, and Uganda provide a snapshot of how urbanization of industry is evolving across Africa. Mozambique and Senegal are characterized by high spatial concentration. Industrial production in Senegal is mainly concentrated in Dakar, with nearly nine out of ten firms and three-quarters of permanent jobs and revenue in 1995. The great majority of industrial enterprises and employment are similarly concentrated in and around Maputo in Mozambique.

Ghana’s industrial firms are primarily concentrated in its two major urban centers: Accra, the capital, and Kumasi, the capital of the interior Ashanti region. Together these two regions account for half of the total number of industrial firms. The high degree of concentration in Greater Accra and the Ashanti region is mainly driven by firms producing similar products or working in the same value chain. Larger scale manufacturing activity is mainly concentrated in the Greater Accra-Tema corridor, where it benefits from urbanization.\textsuperscript{20}

During the 1960s and early 1970s, Uganda’s eastern region was the main industrial hub of the country. This has since changed and Kampala, the capital, has emerged as the major industrial center. The central region around Kampala accounts for 61 percent of manufacturing firms with 42 percent located in Kampala alone. Kampala has the largest share of firms in all manufacturing subsectors except for coffee processing, grain milling, and tea processing, for

\textsuperscript{19} Ayadi and Mattoussi (2014).
\textsuperscript{20} Ackah, Adjasi, and Turkson (2014).
which proximity to supplying agricultural producers drives location choices.\textsuperscript{21}

Africa’s urban population has increased more than tenfold since 1950, from 21 million to 235 million, doubling every twenty-two years. Most African countries have a single large urban area, but several countries (South Africa, Algeria, Cameroon, Egypt, Ghana, Nigeria, and Democratic Republic of the Congo) are seeing the rapid growth of secondary urban areas. Despite the challenges posed by rapid urbanization, Paul Collier and Tony Venables raise a stunning possibility: Africa’s cities may be too small. Because big cities generate powerful scale economies, they believe that to be competitive globally in manufacturing and services, Africa will need cities that are much larger than those that exist today. Citing the rule of thumb described previously, they argue that a firm operating in a city of 10 million people has unit costs around 40 percent lower than a firm operating in a city of only 100,000. Collier and Venables argue that because Africa is a continent of small countries, there is a serious risk that its cities will prove too small to be competitive industrial locations.

City size is overwhelmingly correlated with country size. If two identical countries are merged, the size of their largest city increases by 75 percent.\textsuperscript{22} A comparison with India brings home the point. India is a single country whereas Africa is divided into fifty-four independent political units. India has two cities of over 20 million people. Africa’s biggest city is Lagos, with 10 million people, and it is located in Africa’s most populous country. The more typical African capital city such as Nairobi has a population of only around 3 million.

If Africa’s political fragmentation has inhibited the emergence of large cities with their attendant productivity-enhancing effects, what can be done without redrawing national boundaries? One possible solution to the problem is to pursue deeper regional integration, including freeing up intra-regional migration. The free movement of

\textsuperscript{21} Obwona, Shinyekwa, and Kiiza (2014).
\textsuperscript{22} Collier and Venables (2008).
people across borders in regional economic communities would permit migration from interior countries to a number of coastal locations with the potential for urban growth.

**Agglomeration and Firm-Level Productivity**

A large and growing volume of empirical literature documents the significant productivity gains to firms from industrial agglomeration in middle- and high-income countries. However, we know little about the impact of spatial concentration on firm-level productivity in low-income countries. Isolating productivity gains to firms as a result of locating in a cluster is notoriously difficult. In addition to the usual problems of finding a suitable estimate of productivity using firm-level data, identification of the impact of clustering on productivity is confounded by the possibility of self-selection and the “reflection problem.” It may be that the most productive firms choose to locate in areas that are attractive, due to the presence of better infrastructure or a thicker labor market, for example. Because they are more productive, they are able to afford the higher costs associated with these more desirable locations. If this is the case, an association between agglomeration and firm-level productivity may simply reflect self-selection rather than the impact of proximity on productivity. As was true of learning by exporting and firm dynamics, we need a panel of data to identify the relationship between a measure of geographical concentration and total factor productivity. In the case of agglomeration, the demands on the data are even more exacting: we need to know where firms are located in space.

Because we are particularly interested in the impact of agglomeration in low-income countries, our focus is mainly on localization rather than urbanization economies and on the impact of clustering in low-technology industries. These industrial clusters may be (and often are) in cities, but we are mainly interested in the benefits of concentration that come from within-industry interactions. Later we

discuss inter-industry interactions and their role in knowledge diffusion.

Despite the demanding data requirements and identification challenges, we were able to undertake econometric studies in four of our countries: Cambodia, Ethiopia, Tunisia, and Vietnam. In three of the four studies we found evidence of urbanization economies: the more firms that are clustered together, regardless of what they produce, the better they perform. While this is interesting in itself, it is not that surprising, given that firms tend to cluster in areas where there are natural advantages, such as urban centers, coastal areas, or other areas of strategic importance. We would expect firms to be more productive where infrastructure is better, markets are larger, and transport costs are lower. What is interesting about our country-level econometric studies is that even when we control for urbanization economies we find evidence of productivity spillovers associated with the clustering of similar firms (i.e., localization effects).

The strongest evidence for localization effects comes from Vietnam, where we found significant productivity gains associated with the clustering of firms. The evidence points in the direction of localization economies. Firms located in smaller clusters experienced increases in productivity to a much greater extent than those in larger clusters. One result, which raises some intriguing questions about the sources of these localization effects, was that the productivity gains varied with firm ownership. We found strong evidence that foreign-owned firms enjoyed the greatest productivity benefits from clustering. Privately owned domestic firms also experienced agglomeration economies, but not to the same extent as foreign-owned firms.24 In Tunisia, which is the highest income economy in our sample, we found evidence of localization economies as well. These productivity effects appear to result from the transmission of production knowledge between closely related firms located in proximity to one another.25

In Cambodia and Ethiopia, economies at significantly lower levels of per capita income, we found similar evidence of productivity gains from agglomeration. In Cambodia, we were able to look at the impact of clustering on both formal and informal firms in both manufacturing and services. We found the strongest evidence of productivity gains from clustering in informal enterprises and in manufacturing firms.\(^{26}\)

These results are consistent with the view that clustering is one source of capability building. Transfers of knowledge between firms may be more beneficial to informal firms, because they are likely to have more to learn from formal firms than the other way around.\(^{27}\) It is also not surprising that manufacturing firms experienced productivity gains from clustering to a greater extent than service providers. They have greater potential to benefit from knowledge transfers than firms engaged in such market services as wholesale and retail trade.

Firms in Ethiopia had higher productivity when they were located in the same geographical area, but only if they produced products similar to other firms in the cluster.\(^{28}\) Clusters of unrelated firms did not appear to offer any significant productivity gains from agglomeration. This is quite strong evidence of the importance of localization economies in countries at lower levels of development. The vast majority of firms in Ethiopia are engaged in quite simple manufacturing processes. These results are consistent with the other evidence we have—mainly from case studies—that localization economies are the main source of productivity gains in unsophisticated industries.

\(\text{Clusters, Competition, and Capabilities}\)

In chapters 4 and 5 we described how competition and firm capabilities help to determine firm-level productivity. We pointed out that the distribution of firms across space plays a role in the degree of

\(^{26}\) Chhair and Newman (2014).
\(^{27}\) See, for example, Overman and Venables (2005).
\(^{28}\) Siba and others (2012).
competitive pressure faced by firms, and we also noted that co-location of firms may be an important element in capability building. As promised, we return to these topics, using our quantitative studies of agglomeration and our firm-level surveys to provide some insights into how agglomeration affects competition and the diffusion of capabilities in low-income settings.

**Clusters and Competition**

The econometric studies of agglomeration we carried out for Ethiopia and Cambodia both provide important insights into the ways in which transport costs and localized markets in low-income countries set up an important trade-off between the productivity-enhancing effect of localization economies and the competitive pressures generated when a large number of firms in the same industry locate in a limited geographical area. Increased competitive pressure in localized markets is likely to drive down the price of goods and services.\(^{29}\) Because of heterogeneity in the production costs of firms within clusters, competition for a limited local market will lead to a weeding out of higher cost producers, and survivors will experience an erosion of markups.

A novel contribution of the study on Ethiopia is that it distinguishes between the effect of agglomeration on productivity and prices. Although clustering raises firm-level productivity, clustering of firms producing similar products also has a negative effect on prices.\(^{30}\) While this is good for consumers, it impacts negatively on the revenue of firms. Taken together with the positive productivity gains associated with agglomeration, the net benefit to firms in Ethiopia of locating close to firms engaged in the same industry is close to zero. The consequence of the productivity-price trade-off for firms in Ethiopia is a spatial distribution of industry characterized by small localized concentrations of firms producing essentially similar products.

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30. Siba and others (2012).
We also found that competitive pressures from clustering placed strong downward pressure on firm revenues in Cambodia.\(^{31}\) Competition had a strong negative effect on the price-cost margins of formal enterprises in particular. This may have been due, in part, to the higher and less flexible cost base associated with formality. Formal enterprises in Cambodia face more stringent legal and institutional requirements than informal firms.\(^{32}\) Faced with these constraints, formal firms may have found it more difficult to adjust their costs in the face of increased competition than informal firms. We also found that competition effects were more pronounced for firms in the manufacturing sector than those in the service sector.

Our results from Cambodia, Ethiopia, and Vietnam suggest that we should take a closer look at firms’ incentives to form clusters, taking into account that they may weigh productivity gains against the adverse effects of stronger competition on prices and revenues. In both Cambodia and Ethiopia, the negative effects on prices and markups of more intensive competition due to restricted local markets often outweighed the productivity gains to the firm of localization. In contrast, the positive productivity spillovers associated with clustering found in Vietnam do not seem to have been affected by negative competition effects.\(^{33}\)

Market structure plays an important role in this context. If markets are localized so that local rents may be available, the incentives to agglomerate are weak. It is better for a firm to forgo the increase in productivity in the hope of gaining a market protected from potential competitors. In contrast, if markets are competitive and integrated, firms cannot avoid competition by strategic location. In such a case, the firm’s incentives to agglomerate will be stronger, since the gains from doing so will be larger. One notable difference between Cambodia and Ethiopia and Vietnam was the degree to which internal markets were better integrated. This meant that firms in Vietnam

33. Howard and others (2014).
could exploit a larger domestic market, reducing the productivity-profitability trade-off.

The productivity-profitability trade-off introduced by low market integration has some important implications for policy. Investments in infrastructure that increase connectivity and reduce transport costs to larger geographical markets can have an important role in increasing the incentives for and benefits to firms of agglomeration, especially in low-income countries where the primary source of externalities comes from location near firms engaged in the same industry. This also raises another important point: exporting firms, because they face fixed international prices, do not face a price-productivity trade-off.

**Clusters and Capabilities**

Seen from a capabilities perspective, many of the benefits to the firm of locating close to other firms come from the process of building capabilities. Because the transfer of capabilities is most often the outcome of firm-to-firm interactions, the tendency toward geographical concentration is understandable. Firms in the same industry can see what their nearby rivals or counterparts do and seek to emulate them. Workers may leave one firm and join another, carrying their tacit knowledge with them. Common customers or service providers may transfer knowledge along the supply chain. Looked at in this way, localization effects are a source of the transfer of capabilities, and localization economies are revealed capabilities. Similarly, urbanization economies reflect the tendency for technological know-how and innovation to become more important as economies grow richer and industries become more technologically sophisticated. Cities and the knowledge institutions they house are a rich seedbed of new ideas and innovations.

As part of the study of agglomeration in Vietnam, we investigated the driving forces behind the tendency of firms to co-locate.\(^{34}\) We explored the relative importance of natural advantages, trans-
port costs, knowledge transfers, and thick labor markets and found that formal (intentional) and informal (unintentional) knowledge transfers were the most important agglomerative force. We also found that sectors at higher technology levels agglomerated to benefit from a pool of skilled workers. These results suggest that in lower income economies such as Vietnam, formation of clusters of related industries facilitates the transfer of knowledge through the supply chain and the movement of skilled labor.

Our qualitative surveys of supply chain relationships between foreign and domestic firms in seven countries also give us some insight into how geography has shaped the transfer of capabilities in Africa and emerging Asia. Most of the multinational firms that we interviewed were centrally located in industrial clusters and their interactions with purchasers and suppliers tended to be within the agglomeration. As we pointed out in chapter 5, the density of relationships between firms along the supply chain was substantially greater in Cambodia and Vietnam than in the countries we studied in sub-Saharan Africa. There were few links between multinational enterprises and domestic firms observed in Africa, even within established clusters.

Because the transfer of capabilities from foreign firms to domestic firms most often required direct and close interaction between the parties involved, our results suggest that industrial clusters in Africa have not reached their full potential for the transfer of capabilities. This is primarily because Africa’s industrial clusters, anchored on foreign firms, are much less densely populated with domestic firms than those in Cambodia and Vietnam. This limits the potential for firm-to-firm interactions.

**Summing Up**

Economic geographers and business people have long recognized that firms tend to cluster together, often in cities. Mainstream economics

appears to be finally catching up. The New Economic Geography has raised our awareness of the importance of agglomeration economies as a source of firm-level productivity. At the risk of simplification, the productivity-enhancing role of agglomeration can be divided into two sources. The first arises when firms producing similar products and their purchasers and suppliers congregate in the same geographical area, forming an industrial cluster, and the benefits conferred by such clusters are often referred to as localization economies. The second occurs when firms in diverse sectors locate in a city. The benefits conferred by these agglomerations are often referred to as urbanization economies.

Like many of the patterns we have described throughout this book, the relative importance of localization and urbanization seems to vary with the level of development and the level of sophistication of the industry. At low levels of per capita income, localization economies appear to be the most important. This is true not only for manufacturing. Case studies suggest it applies to industries without smokestacks as well, such as information technology-based services and agro-industrial exports, including horticulture. As income rises, cities grow and urbanization economies become increasingly relevant. There is also some evidence—almost wholly drawn from middle- and high-income countries—that as the level of technological sophistication of industry increases, urbanization effects begin to outweigh localization effects.

While there has been a substantial amount of quantitative research into the nature and extent of agglomeration economies in middle- and high-income countries, virtually all of what we know about agglomeration in low-income countries comes from case studies. For this reason we tried in Learning to Compete to understand the quantitative impacts of agglomeration on firm productivity in low-income countries. Our most significant finding was that, as in higher income countries, agglomerations raise firm-level productivity.

We found that in a number of important ways agglomeration effects in low-income countries differ from those found in higher

36. See, for example, UNIDO (2009) and Sonobe and Otsuka (2006).
income settings. To the extent that we are able to distinguish between them, localization economies appear to be more important than urbanization to the firms in our sample of countries. Our results also point to an important countervailing factor: competition. In poor economies with limited infrastructure, markets are highly localized. Entry of new firms into the same industrial cluster increases competitive pressure on all firms and may result in reductions in price. Firms face a price-productivity trade-off, which becomes more acute the less well integrated product markets are nationally. This trade-off is not present when the firms in a cluster are exporters, a theme to which we return in chapter 7.