

What can logistics do for you?

In a new book, an MIT professor argues that investment in global transportation hubs can spur a ‘feedback loop’ of regional growth.

Peter Dizikes, MIT News Office
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A couple of decades ago, visitors to the quiet city of Zaragoza, Spain, had no reason to think it would become a capital of world trade. But in 2000, the city opened Europe’s largest logistics hub, called PLAZA — and now Zaragoza is a key global shipping link, connecting manufacturers, suppliers and distributors, among others involved in international commerce. Fish caught off the coast of Namibia, in Africa, are flown to Zaragoza before being sold around the Iberian peninsula; clothes made in Portugal stop in Zaragoza en route to Asia. Meanwhile, the presence of the transportation hub has convinced more businesses to locate themselves near the city.

“It is a positive feedback loop,” says Yossi Sheffi, the Elisha Gray II Professor of Engineering Systems at MIT and author of a new book on the growth of logistics hubs and their role in driving economic growth. In places such as Zaragoza, he says, there is “a self-reinforcing mechanism where the logistics cluster grows, providing lower costs and a higher level of service to the companies there, attracting even more companies, making the location even more attractive, providing more and more jobs.”

Spanish officials believe PLAZA employs about 10,000 people, and its presence has created many other jobs around the logistics park.

Sheffi’s book, “[Logistics Clusters: Delivering Value and Driving Growth](#),” published this fall by MIT Press, explores how many cities, including seemingly unfashionable metropolises such as Zaragoza — or Rotterdam, in the Netherlands, and Memphis, Louisville and Indianapolis in the United States — have turned themselves into 21st-century economic winners by carving out an important role for themselves in global trade networks, even as similar areas grapple with industrial decline.

It is a strategy, Sheffi thinks, that other city and regional officials would be wise to consider — partly because, he says, the benefits of having a logistic cluster in a region can be spread out widely within a city’s population. The shipping industry employs a wide variety of workers and provides opportunities for professional advancement.

“Jobs in logistics create social justice,” Sheffi says. “There is huge upward mobility, because this industry values on-the-floor experience. Almost every company that I visit hires from within — and if not within the company, they invariably hire from within the industry.”

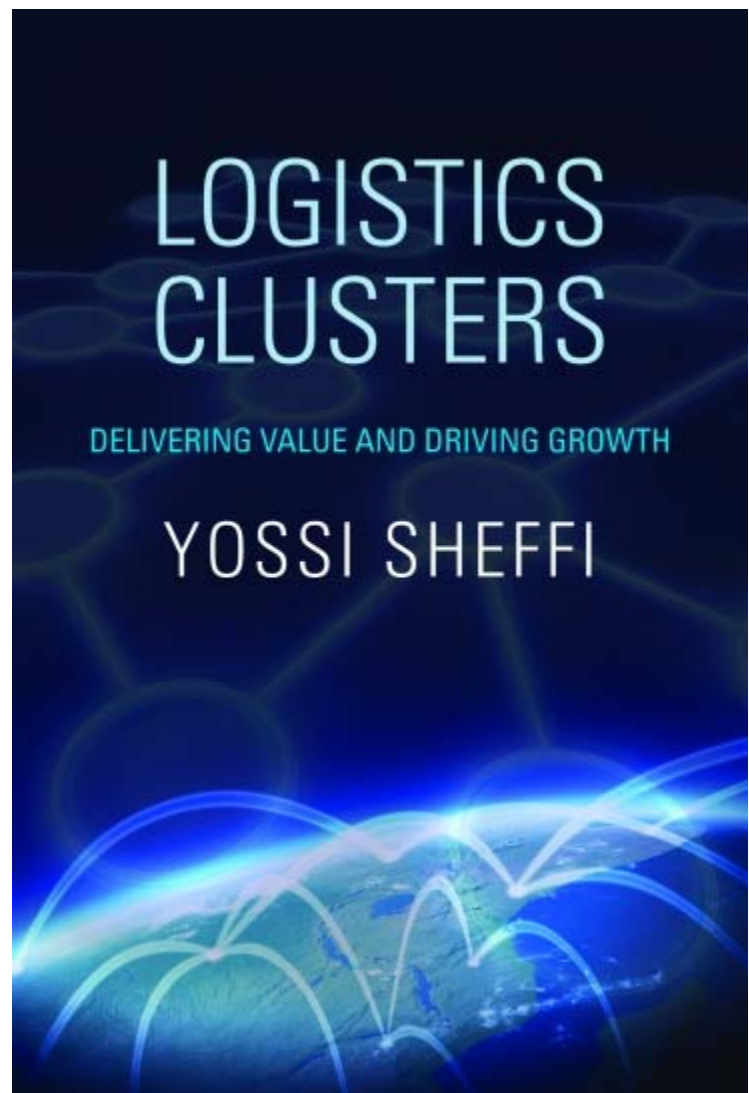


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If you build it, they will come

In surveying cities that have become global freight hubs, Sheffi finds that there is no one template for success, in infrastructure or geographic location; cities that have become logistics centers have generally just aggressively taken advantage of the assets they do have.

Zaragoza, for instance, is 150 miles from the coast, and not especially close to either Madrid or Barcelona, Spain's biggest cities. But it does have a central location, and a major military airport that the United States built in the 1950s.

Spain took control of the airfield in the 1990s, giving Zaragoza long, heavy-duty runways suitable for 747s and other large planes. Memphis (home of FedEx) and Louisville (where UPS has its major operations) have followed a similar path by developing air-freight operations. On the other hand, many cities — including Los Angeles, Rotterdam, Sao Paulo and Singapore — have built around their major ports to become even larger freight hubs

However they originate, Sheffi finds that successful logistics clusters share common elements in their growth. Industrial firms will relocate distribution centers to be near the transportation hubs. More companies will follow, leading to a higher frequency of movements: more flights, trains, trucks and ships. As shipping volume grows, the transportation companies can move goods with a lower cost per shipment. Logistics firms can add new services for their partner firms: UPS handles repair and return work for Toshiba, for instance. This means logistics clusters often contain technical jobs beyond those strictly related to shipping; the average salary in logistics, Sheffi observes, is comparable to that in manufacturing. All this growth, Sheffi adds, can lead to political clout for logistics firms and additional government investment in infrastructure.

Being big thus helps a logistics cluster get even bigger: The Memphis area ranks No. 43 in the United States by population, but is ranked first in air freight, third in rail freight, and fourth in inland barge freight. The city's airport is responsible for 220,000 jobs. Moreover, as Sheffi says, "These jobs cannot be offshored. You have to run distribution locally."

Success in logistics can create clusters of companies in other areas. Indianapolis has a growing life-sciences cluster; Memphis has a large cluster of firms that make medical devices. As in all types of industry clusters, Sheffi notes, "These firms benefit from the labor force with specific expertise. There is a significant knowledge exchange, and there are many opportunities for collaborative operations which reduce the costs and improve the service levels offered by companies in the cluster."

The limits of logistics growth

"Logistics Clusters" caps several years of research by Sheffi, who directs the MIT Center for Transportation and Logistics. Michael Porter, a professor at Harvard Business School, has called the new book "a fascinating description of the power of [logistics] clusters" that shows how they "are getting more important in the global economy, not less."

Still, Sheffi points out that there are limits to logistics clusters as drivers of economic development; not every place can be Memphis, after all. He sees two main limits to the positive-feedback loops some cities have experienced based on transportation. One involves the constraints of physical space in urban areas: Zaragoza grew rapidly, in part, because Barcelona, bordering water, could not expand as a transportation hub in the same way.

Another limitation is environmental: More commercial activity means greater potential for pollution, noise and congestion. For this reason, Sheffi says, some logistics hubs are becoming leaders in environmental sustainability: The port of Los Angeles uses alternative-fuel trucks and has funded development of zero-emissions trucks, while Rotterdam and Singapore are the two largest producers of biofuels in the world. Chicago has invested in infrastructure to reduce congestion by eliminating many railroad crossings.

Ultimately, Sheffi notes, logistics clusters not only enable trade to occur, but their presence can spur more of it.

Even given the rocky economic patch of the last few years, Sheffi concludes in the book, in the long run there will almost certainly be a need for more and better nodes in the global freight transportation network: “Growth may happen in fits and starts but, surely, it will happen.”

