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Book Review: Logistics clusters

Premium

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Self-fulfilling, positive feedback loops give shippers flexibility, competitive pricing.

By Eric Kulisch

People who manage the movement of freight know how to pick the best facilities, service providers and locations to maximize speed and efficiency, but without taking a step back it's easy to not notice that many logistics resources tend to be concentrated in certain places.

This co-location of different companies and transport modes, warehousing, educational institutions, and peripheral services occurs through some combination of government planning and market forces.

In a new book, *Logistics Clusters: Delivering Value and Driving Growth*, MIT Professor Yossi Sheffi makes the case that bunching logistics activity in certain areas creates a critical mass that gives shippers service flexibility and competitive pricing. And these logistics clusters, Sheffi says, both enable and benefit from globalization, which depends on hyper-efficient supply chains to make international trade pay off.



Sheffi

Some may perceive a logistics cluster as a planned development, such as the massive multi-client CenterPoint Intermodal Center in Joliet, Ill., or Alliance Park near Fort Worth, Texas, or a campus operated by a single entity such as UPS. But Sheffi sees the subject more broadly so that an entire city or region can be considered a logistics cluster.

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By his definition, Los Angeles is a logistics cluster because it is home to two major seaports, an international airport, the Inland Empire's agglomeration of distribution centers, a huge number of short- and long-haul trucking companies, the terminus for two major trans-continental railroads, and port-sponsored research on clean-emissions technology.

Sheffi, who heads the MIT Center for Transportation and Logistics in Boston, describes how logistics clusters attract companies because of the economics of having so many related services in one place. His poster child for logistics excellence is PLAZA (Platforma Logistica de Zaragoza), the largest logistics park in Europe located in Zaragoza, Spain.

One of the more fascinating parts of the book describes how modern-day logistics clusters share common characteristics with other well-known economic clusters such as Silicon Valley (high-tech), Hollywood (film studios), Detroit (autos), Paris (fashion), and Wall Street (finance). Not mentioned in the book, but also qualifying as modern-day clusters, are San Diego (global center for human genome research) and Orlando (computer simulation — spawned by Disney and Universal Theme Park). They are examples of horizontal relationships in which companies both compete and cooperate with each other in ways that benefit them.

We also get a history lesson about how Florence became the center of the art world during the Middle Ages. The density of wealthy patrons with business in international trade, and later in banking, served as a magnet for artisans, who in turn trained workshop apprentices and formed guilds to share best practices.

The Florentine analogy was very interesting, but a bit too detailed. I learned more than I wanted about Luca della Robbia's formula for opaque-white tin-oxide glaze and firing methods and use of metal oxides for color in his terracotta sculptures.

As industries concentrate within geographic proximity of each other they attract workers, investment, and intellectual capital and become incubators of knowledge, innovation and culture in a self-reinforcing mechanism that spurs more economic activity. Clusters are natural locations for universities or satellite facilities because companies need a skilled workforce and ongoing research help. Graduates then often stay in the area because of the available job opportunities. Living and working in the same area enables professionals to share knowledge, network and learn through formal and informal interaction.

The concentration of related services — in this case multi-modal transportation and logistics companies — makes the region more competitive vis-à-vis other areas because shippers have a wide variety of freight

transportation options at lower cost, Sheffi said.

It's simple economics, really. When there is more freight moving to and from a specific area, more transportation companies arrive to meet that demand and their cost per shipment tends to be lower, which, along with greater competition, translates into better pricing. To differentiate themselves, the carriers offer more services (new destinations, non-stop service, and premium handling) and opportunities for consolidation. And warehouses in close proximity to one another can share space — renting excess capacity from a competitor or vice versa — as needed to accommodate the ups and downs in their customers' order volumes.

“Clusters grow as a result of positive feedback or reciprocal reinforcement forces,” Sheffi wrote. “As more companies of a certain type (or certain corporate functions) move in, more suppliers and customers move in, making the cluster even more attractive. Furthermore, as the cluster grows, its influence with government grows, affecting further infrastructure investments as well as advantageous regulations, attracting — again — even more companies.”

Among the major logistics clusters described in the book are Singapore, The Netherlands, Panama and the Panama Canal, and Memphis, Tenn.

FedEx established its main air hub in Memphis in 1973 because of its proximity to East Coast population centers, relative good weather, and support from city leaders — and other companies followed it there. Flextronics, a maker of medical devices, is located near the end of the runway so it can quickly ship its medical devices to customers. Memphis is also a barge, truck and rail hub because of its flood-resistant central location.

Sheffi is at his best in Chapter 1, recounting with a breezy writing style the amazing story of PLAZA's development in the past decade as a logistics hub, as well as how famous Spanish fashion retailer Zara and fish processor Caldero choreograph complex supply chain functions through the center.

Officials in the autonomous region of Aragon made a strategic decision to create a giant logistics park because of concerns that the province of Zaragoza was too dependent on the automotive industry, namely General Motors' Opel factory. At first glance, Zaragoza doesn't seem a logical choice as a freight hub. It has a modest population of 800,000 and is hours from any seaport. But it sits on the crossroads of several major highways and railroad lines that link to pan-European networks, is roughly equidistant from Spain's four largest cities as well as Spanish ports on the Atlantic Ocean and Mediterranean Sea, and operates a former Cold War-era military airport used by the U.S. Air Force that has been converted to civilian use and can handle the world's largest freighter aircraft.

Local authorities were able to buy up vast tracts of farmland, collaborate with the national government to build a high-speed rail connection to Barcelona and Madrid, and convince Zara to become its anchor tenant by locating a massive new distribution center in PLAZA instead of Barcelona. Developers also built a post-graduate education and research center operated by MIT in the middle of PLAZA and the companies there act as “a living laboratory” for the Zaragoza Logistics Centers’ students and researchers.

Its central location in Europe, scale and multimodal connectivity — including container rail service — give shippers the best selection of shipment frequency, size, speed and cost.

All logistics clusters offer the benefit of added flexibility. Centralizing operations also enables companies that source around the world to balance supply and demand. And where goods congregate, Sheffi said, become natural locations for doing more pre-store preparation. As in manufacturing clusters, suppliers naturally establish operations in the same area to provide service to the Tier 1 firms. Caldero, for example, encouraged Sealed Air Corp. to build a specialized packaging plant in PLAZA for sealing fish for display. A second supplier, Logifruit, which makes recycled plastic containers for the fish also moved to Zaragoza to better serve Caldero.

PLAZA dwarfs most other logistics parks in Europe and, Sheffi said, it was built that way intentionally to bring a critical mass of customers that would ensure the constant availability of reliable, high-quality transportation and to deter other regions from building their own logistics parks.

“The more logistics clusters, the more logistics and transport costs go down, and the more trade there is. And the more trade there is the more logistics clusters are needed,” he said in an interview over lunch at a downtown Washington restaurant. “By concentrating these activities, you also make it economical to find solutions.”

Sheffi — a serial entrepreneur whose companies have since been bought by the likes of Ryder Systems, Manhattan Associates (logistics software) and Sabre (passenger airline reservation platform) — noted the irony of many governments courting sexy industries such as bio-medicine and technology without realizing how valuable the logistics industry is for economic growth and job creation. With unemployment high, the best thing about logistics is that it provides jobs at all levels, from packers on the loading dock, to information technology specialists and executives.

There is also an element of social justice associated with logistics activity, Sheffi added during the conversation. Logistics, he said, is an industry that values experience and companies frequently promote from within, while other low-paying industries such as restaurants and gaming don’t have the same

upward mobility. The average salary of a logistics worker in the United States is just a hair under that of manufacturing and logistics functions and usually cannot be outsourced because goods have to be physically distributed in the area where they are processed or sold.

Logistics clusters he said are also better from an environmental perspective because the density of shippers means trucks are fuller, thereby requiring fewer truck moves to transport the same amount of freight. The political pressure to reduce pollution leads cluster areas to become hubs of sustainability innovation. The ports of Los Angeles and Rotterdam, for example, are leaders in spurring green transportation technology.

Logistics Clusters was an excellent read and made a strong argument for why public policy should support these types of industrial areas.

But by mid-way through the book I got the

feeling that I wasn't reading just about clusters, but the logistics industry from A to Z. Sheffi essentially gave a primer on every type of logistics activity, how government can foster logistics development through infrastructure investment, regulation and taxation, and the role of education — factors that come into play wherever distribution is involved.

By offering such a comprehensive view of supply chains and the logistics activity within them Sheffi muddied the focus on the clusters themselves and basically made the entire industry seem like a giant cluster because many services are available whether or not a company is in a cluster. We also got an extensive overview of entire transportation networks — highways, airports, inland waters, pipelines — that crisscross nations and how infrastructure capacity and congestion impact freight flows. Those are important topics too, but maybe more appropriate in a broader overview of the logistics landscape because after a while I couldn't distinguish one port or area from another in terms of their relevance as logistics clusters.

And there's another issue associated with clusters that was neglected. Clusters concentrate risk. When the Japanese earthquake/tsunami/radiation disaster struck in 2011 the impact on Japanese automakers was greater because so many of their key suppliers were bunched up in devastated areas of the country. Later that year the floods in Thailand also interrupted suppliers from feeding parts to Asian automakers, resulting in lost sales because dealers could not get enough cars.

In many cases, companies may be better off creating “virtual clusters” — networks of electronically connected companies and professionals — as opposed to geographic clusters, Douglas Kent, vice president of electronics distributor Avnet Velocity, said Oct. 1 during a panel at the Council of Supply

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"Now, with virtualization you can create centers of excellence across geographies to lessen the risk," he explained after the presentation.

"Clustering does have its benefits, but if you find you're clustering in a geography that's a high-risk geography then maybe you want to think about ways to use information technology capabilities for doing information sharing as opposed to just physical clustering," Kent said.

(*Logistics Clusters: Delivering Value and Driving Growth* is published by MIT Press and available for \$29.95.)

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