PROLOGIS Research

Persistent Disruption

Prologis West Ontario Logistics Center, Ontario, California.

Supply chains will shift permanently toward resilience. This will create powerful demand tailwinds in logistics real estate and could prolong or worsen the shortage of space and labor. Tomorrow's supply chain will be defined by those who act quickly and decisively.

Key messages

1. **Higher inventory-to-sales ratios are key to the future supply chain.** Disruptions in the flow of goods will persist beyond the pandemic, driven by structural forces in climate, geopolitics and labor.
2. **Higher inventories will require 800 million square feet (MSF) of logistics real estate** or more to fix the shortage and build in resilience. Logistics real estate leasing is not yet reflecting resilience-driven demand because companies need to first focus on immediate inventory challenges.
3. **Gateway locations are poised to benefit** as the first step on the consumption end of supply chains. Because these locations generally have high barriers to new logistics development, demand is expected to outstrip supply.

Inventory patterns need to change. Even though the *just-in-time* model allowed for a structural decline in inventory-to-sales ratios, it also relied on the smooth flow of goods [exhibit 1]. The decline steadied in the 2010s as e-commerce grew as a share of the retail business; online channels that offer more product variety by default require more inventory.

Disruptions are interrupting this flow, as the interconnected structural shifts that drive climate [exhibit 2], geopolitical [exhibit 3] and labor risks [exhibit 4] increase. Today's disruptions offer a preview: the pandemic; weather (the impact of the deep freeze in Texas on chemical plants, for example); trade (Brexit uncertainties); and labor shortages (drayage constraints and a lack of truck drivers) combined in 2021 to bring widespread shortages, supply chain volatility and higher costs.

Exhibit 1

INVENTORIES TO SALES RATIO, U.S. RETAILERS EXCL. AUTO

ratio

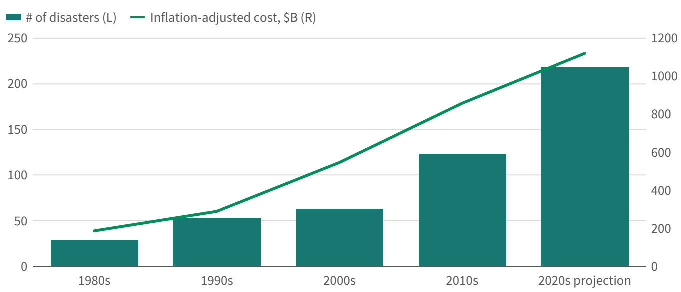
Source: U.S. Census, Prologis Research

Exhibit 2

MAJOR WEATHER DISASTERS BY DECADE, U.S.

# of disasters with >$1B damage, inflation-adjusted 2021 dollars

Estimated total damage, $B

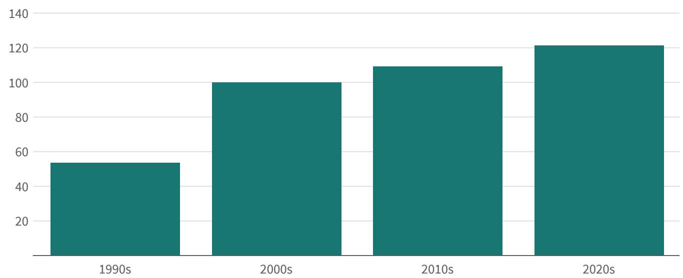


Note: 2021 projection straight-lined based on decade to-date data as of September 2021.
Source: NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). https://www.ncdc.noaa.gov/billions/, DOI: 10.25921/stkw-7w73, Prologis Research.

Exhibit 3

GEOPOLITICAL RISK INDEX BY DECADE

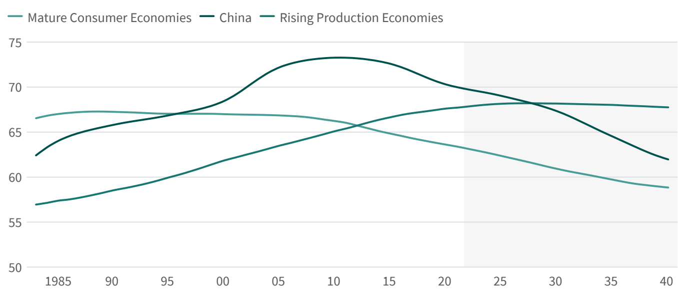
Average from 2000-2009=100



Source: Caldara, Dario and Matteo Iacoviello, "Measuring Geopolitical Risk," working paper, Board of Governors of the Federal Reserve Board, 2017," Prologis Research.

Exhibit 4

RATIO, LABOR FORCE TO POPULATION



Note: Mature Consumer Economies includes U.S., Eurozone, and Japan; Rising Production Economies includes Mexico, Brazil, Vietnam, Indonesia and India.
Source: Oxford Economics, Prologis Research.

Inventory growth will require 800 million square feet (MSF) of logistics real estate or more to fix the shortage and build in resilience.

- **Truly resilient inventories could drive the incremental need for 270 to 700 MSF of logistics space in the U.S.**, based on 5 to 15 percent growth in inventories over the based on 5 to 15 percent growth in inventories over the medium term.[1] This shift has not even begun to be expressed in logistics leasing because companies are solving for short-term supply chain dislocations.
- **The current shortage could require up to 600 MSF of logistics space in the near term**, to get back to the average 2010s inventory-to-sales ratio. A big driver is the strength of recent goods sales; retailer inventories would need to increase by 13 percent to accommodate 2021 retail sales levels vs. only 1.5% for 2019 retail sales.[2]

While there is some room in stores and warehouses to accommodate this short-term correction [exhibit 5], the two forces could generate the need for more than 800 MSF of logistics space over the next several years.[3] In the top 28 U.S. markets, total vacant and unleased space under construction is less than 600 MSF as of Q3 2021.[4]

Exhibit 5

INVENTORY PER OCCUPIED LOGISTICS SQUARE FOOT, U.S.

2012 $ per SF

Note: Wholesale and Retail Inventories excluding Auto.
Source: U.S. Census, CBRE-EA, Prologis Research.

Exhibit 6

PROLOGIS IBI™ UTILIZATION RATE, U.S.

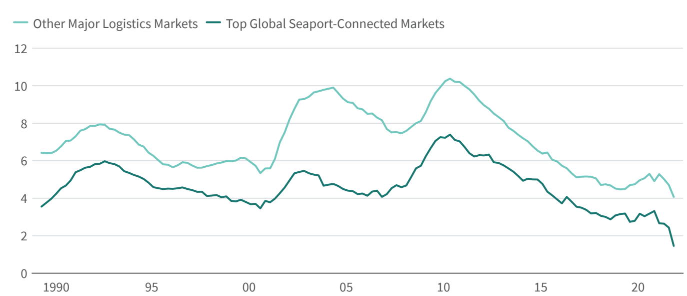
% of space

Source: Prologis Research.

Exhibit 7

LOGISTICS VACANCY RATE BY CONNECTION TO MAJOR SEAPORT, GLOBAL

%



Note: Includes top global ports of Shanghai, Tianjin, Guangzhou, Tokyo, SoCal, greater New York City, Rotterdam/Southern Netherlands, Hamburg.
Source: CBRE, JLL, Gerald Eve, Prologis Research.

This demand should disproportionately benefit Gateway locations, which offer the greatest optionality for the direction of goods, even as inventories will be spread across a broad range of locations. Locations close to end consumers especially bolster resilience due to immediate distribution potential which could then trigger replenishment from upstream of the supply chain. Secondary or tertiary locations are unlikely to benefit as higher transportation costs outweigh any rent savings. High-and-rising barriers to new logistics development in Gateway locations could push some growth into adjacent markets or increase demand for redevelopment or repositioning options. This scenario is already surfacing as companies aim to get control over inventory quickly: The average vacancy rate in the top global seaport-connected markets is less than 2 percent, about half that of other markets and down from a historical average of 4.7 percent [exhibit 7].[5]

Endnotes

1. Based on coefficients from a 4-factor OLS regression of real retailer inventories excl. auto, real wholesale inventories, real retail sales excl. auto/foods services/gasoline, and e-commerce penetration on U.S. logistics real estate demand growth, spanning from 1996 to 2021. Sources: U.S. Census, CBRE, Colliers, Cushman & Wakefield, JLL, CBRE-EA, Prologis Research.
2. U.S. Census, Prologis Research. Current data for the 12 months from September 2020-August 2021; historical comparison to a CPI-adjusted average for 2019; based on retailer ex. auto inventories and sales.
3. Prologis IBITM Utilization Rate remained below 85% as of September 2021 vs. all-time high of 87%.
4. Top 28 markets are defined as those where Prologis has a presence. Sources: CBRE, JLL, Colliers, Cushman & Wakefield, CBRE-EA, Prologis Research.
5. CBRE, JLL, Colliers, Cushman & Wakefield, Gerald Eve, CBRE-EA, Prologis Research. Long-term average from 1990-2020.

About Prologis Research

Prologis' Research department studies fundamental and investment trends and Prologis' customers' needs to assist in identifying opportunities and avoiding risk across four continents. The team contributes to investment decisions and long-term strategic initiatives, in addition to publishing white papers and other research reports. Prologis publishes research on the market dynamics impacting Prologis' customers' businesses, including global supply chain issues and developments in the logistics and real estate industries. Prologis' dedicated research team works collaboratively with all company departments to help guide Prologis' market entry, expansion, acquisition and development strategies.

About Prologis

Prologis, Inc. is the global leader in logistics real estate with a focus on high-barrier, high-growth markets. As of September 30, 2021, the company owned or had investments in, on a wholly owned basis or through co-investment ventures, properties and development projects expected to total approximately 994 million square feet (92 million square meters) in 19 countries.

Prologis leases modern logistics facilities to a diverse base of approximately 5,500 customers principally across two major categories: business-to-business and retail/online fulfillment.

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