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## WHY ARE SUPPLY CHAINS BLOCKED?

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**Michael Spence**, Nobel laureate in economics, Professor of Economics Emeritus and former dean of the Graduate School of Business at Stanford University

*When forecasts are not specific enough to be actionable, the supply response cannot adjust in a timely or efficient manner. And because there is relatively little slack built into global supply chains, large deviations from normal patterns produce delayed responses, shortages, backlogs, and bottlenecks, like those today.*

MILAN - Supply-chain disruptions are severely hampering the global economic recovery. It is a strange situation in many ways. The types of products and services affected by delays and shortages - including a wide range of intermediate goods, from commodities to semiconductors, and the final products that depend on them - resemble what one would see in a wartime economy. And the disruptions took us largely by surprise.

In fact, in the first quarter of this year, growth was overwhelmingly projected to accelerate, and experts were not exactly sounding the alarm that supply would fail to keep up. Yes, influential macroeconomists did warn that the combination of highly accommodative monetary policy, elevated household-savings balances, pent-up demand, and massive fiscal spending significantly increased the risk of inflation. And, yes, those forecasts - which appear increasingly prescient - implied that a surge in aggregate demand, fueled by a wall of liquidity and frothy asset prices, could outpace supply. But the likely duration of the imbalance remained unknown, and many argued that inflation - and, by extension, supply disruptions - would be "transitory."

Many observers remain convinced that this is the case. But participants in global supply chains increasingly predict that the shortages, backlogs, and imbalances between supply and demand will persist well into 2022, and perhaps longer.

It seems clear that, for some significant period, global economic growth will be constrained by supply - a sharp contrast from the years after the 2008 global financial crisis. Although the surge in demand may be larger than mid-pandemic forecasts indicated, it was the basis for the high growth projections in the pandemic recovery period.

That makes it all the more important to address two fundamental supply-side questions. First, are there underlying supply constraints that will persist even after pandemic-related blockages are cleared? And, second, is there something about the configuration and functioning of global supply chains that affects the supply response?

One can reasonably make the case that the pandemic produced semi-permanent changes in some supply factors. For starters, many workers have dropped out of the labor market or deferred reentering it, despite the rollback of pandemic-support mechanisms. This probably has much to do with the highly stressful or dangerous conditions under which some, such as health-care personnel, worked during the pandemic. Many cargo workers were stranded on ships for months.

If workers are to accept such positions now, they will probably demand better compensation and changes in working conditions. Likewise, many of those who shifted to working remotely during the pandemic are resisting a full-time return to the office. Such shifting demands and preferences imply supply-side changes in many segments of the labor market, with unknown long-run effects. But labor-supply effects are only part of the story. We knew that a surge in demand was coming. So, why were global supply chains caught flat-footed?

One reason is that pent-up demand was unleashed before the pandemic was actually over. So, as demand increased, pandemic-related disruptions continued to affect major ports and manufacturing facilities, dampening the supply response.

Another factor is that demand seems to have risen beyond the system's peak load capacity. Expanding that capacity will require investment and, more important, time. But, while peak load capacity is crucial in services like electricity (which is difficult to store), it is less important for goods, demand for which must be managed with a well-functioning system that anticipates surges and spreads out the order flow.

Therein lies the problem. Global supply networks, as they are currently constituted, are complex, decentralized, and wound tightly, in order to maximize efficiency and minimize waste. But, while this approach works in normal times, it cannot handle major shocks or perturbations. Decentralization, in particular, leads to underinvestment in resilience, because the private returns on such investments are much smaller than the system-wide returns or benefits.

Another consequence of decentralization is subtler, and perhaps most easily explained with an analogy to weather forecasting. Although weather is the result of an incredibly complex and interconnected system, forecasting has become increasingly precise and accurate over time, thanks to highly sophisticated models that capture the way relevant factors – such as wind, atmospheric and ocean temperatures, and cloud formation – interact.

Global supply networks are similarly complex. But, while we might be able to anticipate broad trends – such as that demand will increase – there is no model or set of models that enable us to predict with any precision how such trends might affect specific elements in supply chains. We have no way of knowing, for example, where new bottlenecks will occur, let alone how market participants should adjust their behavior.

When forecasts are not specific enough to be actionable, the system cannot adjust in a timely or efficient manner. The system is essentially myopic: it discovers the blockages when they occur. And because there is relatively little slack built into it, large deviations from normal patterns produce delayed responses, shortages, backlogs, and bottlenecks, like those we are seeing today.

The conclusion is clear: We need better models for predicting how supply chains will evolve, including their likely responses to shocks. These forecasts need to be publicly available so that all participants can see them and adapt. Artificial intelligence would likely be the key to success; indeed, this is a natural application of the technology. But international cooperation, with countries sharing real-time data generated by supply-chain networks, would also be needed.

The costs of a hurricane or tsunami are greatly reduced when accurate forecasts enable people to plan ahead. Supply-chain disruptions are no different.

## WILL DEGLOBALIZATION FUEL INFLATION?

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*Some economists argue that the pandemic-driven retreat from globalization, together with population aging in China and the advanced economies, is a recipe for inflation. But while workers' bargaining power may rise, a wage-price spiral in the advanced economies is unlikely.*

MUNICH – Inflation seems to be on everyone's mind nowadays. The debate usually centers on whether America's massive monetary and fiscal stimulus will de-anchor inflation expectations and cause prices to spin out of control. But there is another trend that could also generate inflationary pressure: deglobalization.

Deglobalization has been occurring since the 2008 global financial crisis. But the coronavirus pandemic has accelerated the trend significantly. Using data from the financial crisis, Kemal Kilic and I predict that the COVID-19 shock is likely to lead to a 35% decline in cross-border value chains – the main factor driving globalization over the last three decades.

A recent survey by the Munich-based ifo Institute supports this conclusion. The study showed that about 19% of German manufacturing firms plan to reshore production. Of these, 12% will begin acquiring inputs from German suppliers, and 7% will produce them in-house.

Rising transport costs are likely to accelerate the shift away from global value chains. During the pandemic, the cost of containers used to ship goods from Asia to Europe and the United States has risen nearly tenfold, and transport workers, facing increasingly harsh working conditions, have been leaving their jobs. Overall, the price of moving goods for businesses is up to ten times higher than it was just a year ago.

These developments have diminished the profitability of global value chains significantly. Firms embraced offshoring to take advantage of far lower wages in post-communist Europe, and in China, especially after it joined the World Trade Organization in 2001. And a revolution in the transport sector - containerization - facilitated the process by helping to keep transport costs low enough that they didn't offset wage differentials.

Today, those differentials are smaller, and transport costs are much higher, weakening firms' incentive to keep their activities in far-flung locations. Moreover, onshoring (or "near-shoring") reduces their vulnerability to global shocks.

According to Charles Goodhart and Manoj Pradhan, the resulting retreat from globalization, together with population aging in China and the advanced economies, is a recipe for inflation. In their view, globalization held down prices for three decades: when production moved to low-wage countries, wages everywhere were suppressed. As cheap labor becomes increasingly difficult to find, both at home and abroad, the bargaining power of labor in high-income countries will rise, compounding inflationary pressures.

Are they right? Will consumer price inflation and wages pick up after the pandemic, as the world enters a new era of deglobalization?

The answer depends, first, on the extent to which the upheaval in the transport sector persists. If, as some observers argue, the sector is undergoing a fundamental transformation, during which costs will remain high, this could induce a wage-price spiral in rich countries, as workers seek to be compensated for rising prices.

But if firms reshore their activities, the impact of higher transport costs will be significantly diminished. Moreover, the argument that wage pressures will fuel inflation might not hold much water. After all, in many cases, firms in high-income countries can increase their use of robots, rather than hiring more expensive local workers. And, indeed, our research indicates that the reshoring of supply chains promotes the adoption of robots in high-income countries.

Robotization will also diminish the impact of demographic trends on wages. Firms have been anticipating population aging - and the associated shrinking of the labor force - since the 1990s. And, as Daron Acemoglu and Pascual Restrepo have shown, countries undergoing faster population aging have been adopting robots at a faster pace. In Germany, one of the world's fastest-aging societies, robots per 1,000 workers increased from under two in mid-1990 to four in 2019.

Robotization will not only moderate labor scarcity; it might even offset it, leading to a labor surplus. As Acemoglu and Restrepo have pointed out, over the past three decades, automation has displaced far more workers than it has created new jobs. While this certainly carries risks for workers, especially those facing rising prices in advanced economies, it also suggests that deglobalization is unlikely to fuel a surge in inflation any time soon.