MARKET REPORT

Optics and Photonics: A Midyear Look

The industry will need to remain agile to adapt to a “new normal” of shortages and a possible recession.

Tom Hausken

Since the beginning of the COVID-19 pandemic, Optica members have reported playing an endless game of Whack-a-Mole, trying to address shortages in products as diverse as metal for optical bench surfaces and packing materials—particularly in silicon electronics. If anything, the shortages are worse today. Companies have drawn down stockpiles and have resorted to paying brokers premiums to get parts, or redesigning their products to use more available parts. China’s lockdowns this year created new delays for products—and the country may enter a recession as a result.

Global supply chains, already brittle before the pandemic, now face other shocks. A changing international trade landscape is prompting companies to exchange efficiency for resiliency and security to future-proof their supply chains. The optics and photonics industry is known for minimizing inventory costs through “lean inventory,” but some companies have relaxed this and ordered further out to assure supplies. A tight trading scene also means finding alternatives; for example, some companies had to locate new suppliers of crystals, thermoelectric coolers and other products after sanctions were imposed on Russia earlier this year.

The critical shortage continues to be for workers, and the changing landscape affects that, too. Companies with engineers in regions such as Russia, Ukraine and Belarus have to reconsider their locations this year. And companies are more valuable now for their workforce, in addition to their other assets.

Wage and price increases

Worker and supply shortages create upward pressure on wages and prices, but the shortages have not significantly threatened profits of optics and photonics companies. The accompanying figure shows the trends for the US semiconductor price index over 45 years, compared with the US consumer price index (CPI, collected for urban consumers and adjusted for seasonal variations). Supply constraints (as on workers or energy), strong demand (which can be stimulated through government policies and consumer confidence), or both together will drive consumer prices upward. On the other hand, continuous technological
improvements drive prices for semiconductors—and optics and photonics products—ever downward.

The slopes of the curves shown indicate the rate of inflation or deflation of each set of goods. Consumer prices veered upward recently in a surge in inflation, and even the semiconductor index flattened in the last year. Prices for optics and photonics products—such as for displays or image sensors—rose and fell during the pandemic, but trend downward in the long term (see Market Report, OPN, January 2022, p. 16).

Profits for optics and photonics companies appear to have held steady through the pandemic, according to Optica’s examination of selected companies earlier this year (see Market Report, OPN, April 2022, p. 24). Low-volume manufacturers in particular have been able to absorb some of the higher prices charged by suppliers or, in some cases, to pass along the costs by charging higher prices to customers.

As the cost of materials and subcomponents rises, however, it may become increasingly difficult to hold prices constant. Optics and photonics companies can still reduce costs by improving product designs and manufacturing processes—for example, by using more automated machine tools.

Today, the greatest threat to the optics and photonics industry is the risk of a global recession.

However, much of the low-hanging fruit of cost reductions, such as moving operations to regions of cheaper labor, may have already been picked.

No going back

While company financial reports are backward looking, the stock market reflects expectations for future profits. Stock prices of technology companies declined this year after a long upward trajectory, following the news of rising interest rates, inflation and risks of a recession. The established optics and photonics companies have fared better than many others; demand and earnings remain strong, despite shortages of parts and workers. It hasn’t been a good time to take a company to the public stock market, however. Newly public early-stage companies have had a particularly difficult year, including pure-play startup companies offering lidar systems and quantum computing technology.

Today, the greatest threat to the optics and photonics industry is the risk of a global recession. While the industry has a lot of momentum, even a slight pause in orders can produce a “bullwhip effect” among suppliers upstream in the supply chain.

Fortunately, optics and photonics sales are diversified across many vertical markets, each of which responds differently to the economy. The sectors of optical communications and semiconductor machine tools did well through the pandemic and are likely to continue to do well. Military budgets may increase to re-adjust to new geopolitical alliances. The segment in our industry most at risk may be electronic products, if consumers and businesses slow the spending that ramped in pandemic. That would mean slower sales of optical components for such things as smartphones, laptop computers, televisions and AR/VR headsets.

There is no returning to the way things were before the pandemic—too much has changed. However, our industry can remain strong by continuing to be agile in sourcing parts and workers and adjusting to changing market needs and trade alliances.

OPN

Tom Hausken (thausken@optica.org) is Optica’s senior industry adviser.