

Just In Time

Ten years ago it was fashionable in some quarters to wonder where the payoffs to all of our investments in technology were. In those pre-Internet days, technology meant personal computers, nearly all equipped with modems, but few linked together in meaningful networks. Had we simply replaced our IBM typewriters and Hewlett-Packard or Texas Instruments calculators with expensive toys forever in need of upgrades?

Hardly: Much of the continuous prosperity of the 1990s can be attributed to system-wide efficiencies in inventory management; Wal-Mart and Dell, in particular, were exemplars in their respective industries of how to drive costs down by minimizing inventory costs. Their lessons in corporate inventory management led to an early and as yet unfulfilled promise of even greater savings from Web-based supply chain management.

Viewed in another light, much of the 1990s boom stemmed from a greater acceptance of risk in all facets of our national and economic light. Few of us equated inventory management with the peace dividend from the end of the Cold War, but they have the risk element in common.

Friction: More Heat Than Light

The horrible events of September 11 underscored some of the risks to the national economy from widespread acceptance of lower inventories and just in time management thereof. One lesson was small and personal: I had to send a computer diskette by FedEx to a client who had to abandon my documents at the One Liberty Plaza building. As I filled out the bill, the clerk told me the package wouldn't be there the following day. I protested the recipient was in New Jersey, not New York City. No matter – planes weren't flying.

A quick mental multiplication of my piddling problem across the economy as a whole led to an inconceivable total of what we economists call frictional costs, those little inefficiencies whose collective solutions create giant businesses like FedEx and UPS. In the days and weeks to come, each of us will glimpse huge frictional costs in our daily lives, and this no doubt will be reflected in the national economic statistics.

The promise of the Internet, so hyped by the end of 1999, but someday to be realized on a much larger scale, simply was to eliminate the frictional costs of physical transactions by converting them into digital transmissions. Some transactions, however, cannot be digitized, and this creates a permanent set of risks to be managed.

Futures Markets And Inventories

I long ago suspected just in time inventory savings to be an illusion on a risk-adjusted basis. All futures markets on physical commodities are based on the cost of carry model. The concept here is that both buyers and sellers should be indifferent between buying a commodity now and paying the inventory storage costs, and buying the commodity for future delivery and compensating the seller for the storage costs. Of course, buyers try to stick producers with the inventory storage costs wherever and whenever possible. Sometimes, as in the case of extractive commodities such as copper, crude oil, and natural gas, where the cheapest storage is in the ground, this is simple. The forward curves of such commodities frequently are backwarddated (inverted); they decline over time.

The most expensive unit of any commodity is the one you needed and could not get. As a result, buyers tend to maintain some level of inventory. The hedging cost, the amount by which a forward month is selling for less than its full carry level, is dubbed the convenience yield. It measures the degree of insurance being purchased: How much are you willing to pay for the "convenience" of having supplies on hand. This dimension of futures markets is critical and is central to the "tension indices" explained in my book.

The risk of running out of supply in such markets for the buyer is quite real; any disruption in production or transportation can cause the price of the commodity available for prompt delivery to shoot higher. This happened on a grand scale over the past two years in both the natural gas and electricity markets. Energy buyers either have to maintain inventories on hand or invest in their own production capabilities. In the case of electricity, which is impossible to store on a meaningful scale and thus is the ultimate just in time commodity/service, this means buying and storing very expensive generation equipment and the fuel to run same.

Still, the purchase of a generator to keep systems running – or the purchase of videoconferencing equipment to replace air travel – is a classic insurance calculation. All we need to do is assess the probability of a loss occurring against the magnitude of that loss and then decide whether the price of insurance is reasonable. Or even acceptably unreasonable: Any insurance salesman or CBOE market maker will tell you people motivated from fear are willing

to pay an actuarially unfair premium in exchange for peace of mind. Remember, however, no business ever has prospered by fully insuring every risk. Business, at its most essential, simply is the prudent acceptance and management of risk.

Multiplied across the economy as a whole, the collective purchase of insurance in the form of military expenditures, backup systems, disaster recovery centers, security measures, and inventories throughout supply chains will have a cost beyond my ability to calculate. Maybe, hopefully, it won't approach the magnitude of cost savings achieved from decades of computerized inventory management systems. But, it does represent the injection of a huge inefficiency into an economy whose prosperity has been based on rapidly increasing efficiency.

We will absorb this cost and move on; we always do. It's part of the price for freedom, one that all Americans have resolved to pay.