There are a lot of terms bandied about that purport to describe operational excellence in supply chains. I prefer to describe operational excellence in a very basic way: that is, whether or not a supply chain is achieving its operational performance goals under the vagaries of both demand and supply. To achieve true operational excellence, risk management strategies need to be leveraged.

Much of the findings of MIT’s Supply Chain 2020 (SC2020) Project’s early research into excellent supply chains were summarized in the April 2006 issue of Supply Chain Management Review in an article titled, “MIT’s SC2020 Project: The Essence of Excellence.” An excellent supply chain was defined as one that supports, enhances, and is an integral part of a corporate competitive strategy.

As part of the research, we reviewed a multitude of articles that used a variety of terms to discuss operationally-excellent supply chains — including flexible, agile, responsive, adaptive, and lean. While these all sound like attributes you would want in your supply chain, they don’t suffice in describing excellence because more does not necessarily mean better. A supply chain can be too flexible, too agile, too adaptive, too responsive, or too lean. What good is displaying these attributes if a supply chain is too expensive, not able to meet customer service targets, or is too wasteful of assets.

With the exception of lean, these terms generally connote what is needed to meet performance goals under uncertain business conditions in a reactive rather than proactive way. Rather than using these terms to describe operational excellence, a better definition is this: “The ability to set and consistently achieve operational performance objectives (whatever uncertainties might arise).”

Supply chain planning is a proactive approach to preparing for and marshalling resources in anticipation of future demand. A problem with most planning efforts is that they assume no uncertainty in demand or supply. As such, when things do not go according to plan, supply chain managers scurry around fixing problems, trying to be agile, adaptive, responsive, and flexible. These inefficient activities invariably make it hard to consistently achieve performance goals.

An important solution to coping with uncertainties is to plan with them in mind, and put in place more efficient ways of coping with them. Leveraging risk management during planning is a way to build-in the appropriate levels of agility, adaptability, flexibility, and responsiveness.

The Variability Buffering Law
Our SC2020 excellence research debunked “best” practices in favor of “tailored” practices that leveraged basic supply chain principles. We reviewed a textbook, Factory Physics by Wallace Hopp and Mark Spearman, that discussed laws aimed at describing the fundamental behavior of manufacturing systems, especially under uncertainty, that we felt could be extended to supply chains. In the text, key tradeoffs are identified as areas of leverage and opportunities for improvement.

One of the laws I found most useful for identifying risk management methods in supply chain is one called the “Variability Buffering Law.” It states that “variability in a production system will be buffered by some combination of inventory, capacity, and time.” The law helps identify methods for adding buffers needed for sustaining performance that also mitigate against future uncertainties. Here are some examples:

- **Inventory**: Inventory is the most preva-
lent buffering method. The concept of safety stocks is well understood among supply chain managers. In addition, formal techniques exist for setting safety stocks based on uncertain supply lead times and demand uncertainties to achieve customer service-related performance goals. To ensure maximum use of bottlenecked assets the “Theory of Constraints” prescribes using inventory buffers in front of these assets based on the uncertainties of preceding supply activities.

- **Capacity**: The concept of not using 100 percent of capacity is intuitively unappealing. However, when things do not go according to plan in a system running at 100 percent, havoc can ensue. Should there be any upticks in demand or supply glitches, inordinate delays will occur. Thus, from a practical standpoint, operations are utilized significantly below their theoretical maximum. Leveraging the Variability Buffering Law, for example, by running two shifts with a capability to run a third is one way to buffer against supply shortages or upticks in demand. Building in redundancy in a system can also effectively buffer via capacity.

- **Time**: Allowing extra time to take action, make a decision, or service a customer are ways to buffer against variability. For example, manufacturing postponement buffers against demand risk by delaying the defining steps in the manufacturing process of a product until demand is better known. Delaying distribution by holding inventory upstream until absolutely necessary or re-directing goods in-transit are better ways to match variability in demand, geographically. “Service window management” schemes also leverage time buffers. These involve padding the delivery time quoted to customers so that more time is available to service them, should glitches occur during order fulfillment.

The above examples illustrate just a few of the risk management methods that leverage the Variability Buffering Law. So if you want to build agility and other characteristics into your supply chain, think about these and other ways to leverage the law. This will go a long way toward helping you achieve operational excellence, by ensuring your operational performance goals are consistently achieved — despite the fickle fingers of fate!