“We are in a world where risk is becoming a more central issue for senior management and boards of directors. A fundamental area of risk is in the supply chain of the enterprise. Gary Lynch has brought together his years of experience to provide a comprehensive yet pragmatic approach to understanding and managing supply chain risk. His ‘ten laws’ provide a blueprint for the effective management of this very critical source of strategic risk.”

—David A. Hadley, Vice Chairman, Marsh & McLennan Companies

“Single Point of Failure is a must-read book for all executives who are navigating today’s risk-rich space that requires them to predict, measure, manage, and tame uncertainty in real time. Lynch offers a unique blend of risk management theory, micro-economics considerations, and real-life, vividly described examples, creating unique learning moments and providing thought-provoking insights that, if applied, could ultimately create the difference between planned success or inadvertent failure.”

—Francois Nader, Director, President and Chief Executive Officer, NPS Pharmaceuticals, Inc.

“Gary Lynch has brought together his years of experience to provide a comprehensive yet pragmatic approach to understanding and managing supply chain risk. His ‘ten laws’ provide a blueprint for the effective management of this very critical source of strategic risk.”

—James Irwin, Senior Strategic Marketing Manager, Roche

“Lynch captures the dynamics of supply-change management in an effective and comprehensive manner . . . identifying numerous risk factors that impact on reputational capital, and are organic and typically embedded within all organizations that face increased globalization and its associated uncertainties . . . His suggested strategies provide invaluable guidance concerning how organizations can not only recognize leading indicators that may reveal potential supply chain risk, but also anticipate potential future mutations in the evolution of risk profiles associated with the supply chain, and implement remediation and ongoing sustainable best practices in proactively addressing and preventing against salient risk parasites.”

—Jess Boronico, PhD, Dean, School of Management, New York Institute of Technology

“Gary Lynch has been a speaker on pressing global issues of supply chain risk management, and has appeared as a guest on Bloomberg TV, ABC, and CNBC, raising awareness of the need to view supply chain risk as a strategic imperative.”

—Rabbi Lawrence Haïk, Partner, Deloitte

“I am puzzled to consider what it takes to pro-duce the products we depend on—critical drugs like blood thinners, plastic-based products such as syringes, isotopes for medical imaging, and milk-based baby formulas. Or maybe your livelihood depends on your ability to transport products, or on customers having access to your online order system, or on the timely receipt of parts from your suppliers on the other side of the world. The occurrence of a single point of failure—whether a product contamination, labor strike, trade credit crunch, an earthquake, or a health crisis—can interrupt the flow of goods and cause total systemic failure.”

Written by internationally recognized industry veteran Gary Lynch, Single Point of Failure: The Ten Essential Laws of Supply Chain Risk Management reveals just that—the ten vital laws to successfully identifying, measuring, mitigating, and financing risk, with guidance for establishing your organization’s supply risk management program, avoiding bad decisions, and gathering better information and data to make good decisions.

Here, you’ll discover:

• How to establish your organization’s supply risk management program
• Why no risk strategy is a solution for bad decisions
• How to transform supply chain risk management demand to supply management
• The sourcing strategies that create more risk, not less
• Why managing the supply chain does not equal managing the whole
• What’s the best policy is for knowing what’s in your policy

Believing that all is well in a self-delusion. You need to continually analyze and evaluate the risk to your supply chains and business networks, determine and learn the root cause of problems, and decide whether you have

The Ten Essential Laws of Supply Chain Risk Management

Gary S. Lynch

SINGLE POINT OF FAILURE

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Single Point of Failure
I dedicate this book to the future generations that now must manage the risk created by prior generations. To my children Christopher, Robert, Colleen, and Brian; my daughter-in-law Katie; my nieces and nephew, Brian, Jennifer, Matt, Tracey, and Katie; to my best friend’s children, Eden and Erika—I wish you well, for you are the ones who have to tame the risk parasite, a new world of uncertainty, one that is moving faster than anyone’s ability to understand. Finally, I dedicate this book to all those who protect and serve our great nation—thank you.
Contents

About the Author xi

Preface xiii

Acknowledgments xvii

Introduction Getting to the Truth 1

Chapter 1 The Laws of the Laws 9

Laws of the Laws
Risk Management Defined
Law of the Laws #1: Everyone, without Exception, Is Part of a Supply Chain
Law of the Laws #2: No Risk Strategy Is a Substitute for Bad Decisions and a Lack of Risk Consciousness
Law of the Laws #3: It's All in the Details
Law of the Laws #4: People Always Operate from Self-Interest
Indirect and Secondary Impacts
What Can You Conclude?
Notes

Chapter 2 Law #1: If You Don't Manage and Lead Change, You Have to Surrender to It 31

The Risk Wake-Up Call—Planned Change, Unplanned Consequences
We Can't Change the Past, but . . . Can We Change the Future?
Can You See the Icebergs Ahead?
Notes
Chapter 3  
**Law #2: The Paradigm Should Destroy the Parasite: Begin by Defining the Paradigm, Not by Fighting the Parasite**  
61

The Paradigm in Action  
Why Does the Organization Need to Identify a Supply Chain Risk Paradigm?  
Beware! The Paradigm Can Shift without Notice  
If the Shoe Fits  
Notes

Chapter 4  
**Law #3: Manage Your Business DNA in a Petri Dish of Evolving Risk**  
87

Expanding the Risk Awareness Universe  
Know Your Business—Know Your Surroundings  
The Keys to Your Risk Kingdom  
Your Operation’s Complete Footprint  
Your Action Plan  
Notes

Chapter 5  
**Law #4: In Supply Chain Risk Management, Demand Trumps Supply**  
115

Everyone’s Customer  
Building Your Demand-Based Strategy  
Market and Client Factors to Consider  
Notes

Chapter 6  
**Law #5: Never Set Up Your Suppliers for Failure**  
143

Supply Chain Risk Management Program  
Sourcing Strategies That Create More Risk, Not Less  
Trust but Verify  
Notes

Chapter 7  
**Law #6: Managing Production Risk Is a Dirty Job: Focus on Managing the Endless Risk of Manufactured Weakest Links**  
173

Going Global with the Production of Risk  
A New Collaborative Effort  
Why Is Production So Critical?  
Part Two of the Double Whammy: Labor  
Notes
Chapter 8  Law #7: The Logistics Risk Management Rule: Managing the Parts Does Not Equal Managing the Whole  
What Is Logistics Risk?  
Cargo and Warehouse Theft  
The Piracy Risk  
What’s at Risk?  
Single Points of Failure and Aggregate Risk  
Supply Chains Don’t Survive on Product Flows Alone; Information Flows Are Essential  
In the End It’s All about the Priorities and Economics  
Notes  

Chapter 9  Law #8: Mitigation: If Supply Chain Risk Management Isn’t Part of the Solution, It Will Become the Problem  
Now What Do I Do?  
Enter the Risk Intelligent Supply Chain  
Economic Change—A Catalyst for Redefining Resiliency Management  
Predisruption  
At Time of Disruption  
Postdisruption  
What Is Risk Mitigation?  
Notes  

Chapter 10  Law #9: Financing: The Best Policy Is Knowing What’s in Your Policy  
Insurance and Its Role in Supply Chain Risk Management  
Background on Insurance in the Supply Chain Risk Area  
Current Insurance Solutions and Their Limitations  
Introducing Supply Chain Insurance: Approach and Challenges  
Corporate Customer Benefits Arising from Supply Chain Insurance  
Conclusions  
What Does the Future Hold?  
A View from the Insurer’s Side  
Notes
Chapter 11 Law #10: Manage the Risk as You Manage Your Own: Your Supply Chains Are All Interdependent but Unique

Questioning Old Assumptions
Personal Laws of the Laws

Index
Gary S. Lynch, CISSP, is an internationally recognized expert on risk management issues. He is an author and Global Leader of Marsh’s Supply Chain Risk Management Practice. He also leads Marsh’s Global Pandemic Response Center. He works as a management consultant, specializing in helping senior executives solve complex risk issues. He has developed critical thought leadership and solutions around emerging risk issues, including supply chain risk management and financing, information protection strategies and schemes, value chain risk strategies, pandemic preparedness, and IT risk.

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Lynch is a member of the National Association of Corporate Directors (NACD). He received a commendation from the U.S. Secret Service for his 9/11 disaster response and support activity and was awarded the Silver Medal of Valor by the Nassau County Fire Service, New York.
Preface

Have you ever stopped for a moment to think about what is needed to produce the products you depend on? Critical drugs like blood thinners, polyethylene (plastic)-based products such as syringes, isotopes for medical imaging, or milk-based baby formula? Or maybe your livelihood depends on your ability to transport products, your customers having access to your online order entry system, or the timely receipt of parts from your suppliers on the other side of the world. But because of a product contamination, failure of a key supplier, labor strike, trade credit squeeze, earthquake, pandemic, software glitch, project mismanagement, or some other adverse event—what you depend on is simply not available.

Ironically, as this book was on its way to print, that was the case for a select group of patients with rare genetic disorders. According to a Wall Street Journal article, Genzyme Corporation, the biotech company that produces Cerezyme and Fabrazyme (enzyme replacement drugs), had to shut down a critical node in its supply chain—the main U.S. manufacturing plant. The identification of a suspected virus in a vat used to make Cerezyme was the suspected cause. Company officials stated that this single point of failure would cause shortages over the next few months, while analysts were estimating the potential lost revenue from the shutdown to range from between $100 million and $300 million.¹ A virus, an unplanned event that suddenly threatened the well-being of the patients as well as the financial stability of the organization, had halted this supply chain.

The occurrence of a single point of failure, the breakdown of any given product, information, and/or cash flow caused by a process or resource (e.g., people, technology, physical, or relationship) failure

at any given point in global interdependent and interconnected supply chains may interrupt the flow of goods and cause systemic failure. Ask yourself:

- What do I depend on?
- What are these single points of failure and how will my organization be impacted by a failure at different points in the supply chain?
- How do you recognize whether or not you are exposed (and to what degree)?
- Who is responsible for understanding and managing this risk?
- When and where are you most exposed?
- Why should you invest time, resources, capital, and management attention to address these risks?
- And, most important, what can I or my organization do about it?

These are just a few of the questions that I set out to address when I began this book and that you need to keep in mind as you read forward.

When I began the journey, I found that many of the people with whom I interacted globally struggled to define, understand, and articulate the concept of supply chain risk management. All acknowledged that it was important and that they should be addressing the risk—but most weren’t sure if they really were addressing it and they couldn’t concisely define who owned the problem. In many instances, they didn’t know where to start.

So with the help of dozens of experts from industry and academia located around the globe, I set out to define a common language, a shared context, and comprehensive framework to help better understand and manage supply chain risk management. I documented the lessons learned as well as the lessons not learned. This is just the beginning of the journey, and after I completed the manuscript, I realized that I had only begun to scratch the surface. There was so much more to address: enterprise resource planning systems and supply chain technologies, environmental risk and regulations, geopolitical challenges, climate change, and compliance to name a few. I will save those topics for another time. I share with you the countless challenges, practical experience, and the frustration
faced by so many senior managers—risk, procurement, logistics, operations, security, product quality, distribution, compliance, manufacturing, finance, and even directors and senior officers. The issues are not unique to any industry, geography, company, function, or individual. But what is unique is the supply chain itself. Richard Steinke, Executive Director of the Ports of Long Beach, stated, “if you have seen one supply chain . . . you’ve seen one supply chain.”

I would add to his comment that if you’ve seen it—look again—that supply chain and associated risk has probably changed. Simply put, organizations rely on dozens, if not thousands, of virtual supply chains in which the participants and the paths are constantly reshuffled.

So let’s begin the journey together and acknowledge that there is no end point and that we will be forever learning, improving, and hopefully reducing the risk to the supply chains that we depend on so heavily to deliver what we value the most.

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2 The Asia Pacific Economic Cooperation workshop on Trade Disruption, Singapore, 2008
Acknowledgments

Over the past few years, I was fortunate to work alongside many brilliant and experienced professionals from a variety of private industries, public organizations, and geographies. All were concerned about the mounting supply chain risk issue. It was their concern that motivated me to write this book. I’d like to recognize some of the many people who have helped me assemble Single Point of Failure. Unfortunately, contractual obligations of my day job force me to maintain client confidentiality so, for the most part, I regretfully am unable to publicly share their names or the employer’s names. However, I silently want to extend a special thanks for their contribution, confidence, and, most of all, countless real-world stories of the near misses and failures they experienced while trying to manage the forever changing supply chain risk parasite.

Single Point of Failure would not have been possible without the participation, writing, and mind-share from a group of individuals that share my passion to raise awareness to this escalating concern. Nick Wildgoose, Supply Chain Global Product Manager, Zurich Global Corporate, thank you for taking time out of your incredibly hectic schedule to provide the extensive content that led to the creation of the chapter on risk financing. I would like to thank Ben Tucker, Managing Director, Property Practice and Paul McVey as well, Managing Director at Marsh Property Claims for sharing his many, many years (I promised I wouldn’t tell) of experience managing complex business interruption and property-related claims. I would like to extend my gratitude to Paul Ranta and the Corporate Responsibility Team at Nike for their contribution—I appreciate that you took the time to discuss your “war stories,” daily challenges, and evolving strategies. Thank you, Kate Meyers, Senior Manager, Global Corporate Media Relations; Caitlin Morris, Director of Stakeholder
Relations; Mark Loomis, Manager, Corporate Responsibility, and, of course, Paul, Sustainability Manufacturing Operations. Thanks for bringing it all together and helping me understand the daily risk challenges of operating in so many different cultures and political systems. Craig Bartol, Nike’s Global Risk Manager, thank you for your insight with regard to the learning challenge and the need to apply lessons learned to continuously improve the overall risk management program. As I began the process of creating this book, several people were instrumental in shaping my thinking. Gary Mucha, Senior VP of Business Integration and Performance Excellence—thanks for challenging my thinking and driving the concept of the “risk paradigm.” David Nadler, Vice Chairman, Marsh & McLennan Companies, and an expert on organizational behavior—thank you for your insights on the changing business climate and the need for intelligent, collective, technology driven, and socially engineered risk problem solving. Rajeev Kadam, Vice President of Olam International Ltd.—your explanation of risk was spot on; I will carry it forward in my global travels. James Irwin, Global Tamiflu Product Manager, Roche—I appreciated your early insights and perspective on the “people” element of managing complex risk. The research you and your organization provided early on was helpful in formulating the content in the chapter on the demand driven supply chain. Bob Murphy, VP of Operations, Rockwell Automation, thank you for agreeing to share your 30–plus years of experience and insight; your passion for execution is what moves many of these concepts and constructs off the paper and onto the shop floor. Your view of managing supply chain risk management within a given corporate culture was enlightening.

I would also like to express my gratitude to Karen Avery, Managing Director and Head of Business Continuity, for your valuable insights, perspective, and the eleventh-hour proofing; Drew Staniar, a 30-year consumer packaged goods expert and SVP, Marissa Antonio, and Marc Cerro, all colleagues of mine on the Marsh Supply Chain Risk Management Solutions team; Matt Enuco for your early writing and ideas; and Colleen and Brian Lynch for sacrificing the time to proof the many revisions of the chapters.

This book represents the beginning of a journey, one with many twists and turns I experienced while trying to create this material. Yes, even I was substantially impacted by change as the financial crisis took hold; it forced me to dispense with the early writings, push
back the delivery schedule, and start over. So let me end the acknowledgments by saying thank you to John DeRemigis and Judy Howarth at John Wiley & Sons, Inc. for being so patient and supportive. I’d also like to thank Michael Thomsett for helping me write this book. Michael, your patience and support (let’s not forget your ideas) made this happen. Finally, I’d like to thank Myriam Carayannis, my executive assistant at Marsh, for running interference, working the network and calendar, and basically keeping me from jumping off the ledge. Thank you!

P.S.: I forgot one more acknowledgment—to the crew at the Chester Starbucks in New Jersey and Liz and the gang from the 44th Street Starbucks, thank you for the caffeine kick and the conversations. I knew I could count on a visit to get the words flowing again whenever my engine stalled. Please, keep your supply chain resilient; it’s part of my critical infrastructure!
Single Point of Failure
INTRODUCTION

Getting to the Truth

*It’s not what you look at that matters, it’s what you see.*
—Henry David Thoreau

One thing that never ceases to amaze me, after 30 years of working for or with dozens of organizations, is that there are so many conflicting beliefs about the true objective of that organization. This is especially true when it comes to managing and prioritizing the risk to the lifeline of that organization—the supply chain.

Most of you know what I mean. If you ask three people in your organization to describe the objective of their business, you are going to get three different answers. The marketing manager might tell you that the objective of their business is to get the product visible to the greatest number of customers; accountants might say they are in the business of controlling budgets and preparing payroll; and the mail-room clerk might explain that he is in the business of sorting and delivering mail. All have a functional view of their organization, and their actions typically extend to only what they can see, feel, or touch.

These disparate points of view overlook a key reality: The sum of parts enable the whole, but only if the objective is the same and the incentives and penalties are aligned with the agreed-upon objective.
This is especially true when managing supply chains and supply chain risk. Everyone in the corporate hierarchy, from top to bottom, as well as anyone that comes in contact with the supply chain, has a role and specific responsibilities when managing risk to the flow of goods, services, information, and cash. However, the effectiveness and efficiency of supply chain risk management is totally dependent on understanding the organization’s value proposition (through the customer’s vantage point); product, information, and cash flows that support the creation of value; and the functions and resources that are used to support critical flows. Once this is understood then the strength of each individual link in the chain as well as the strength of the connection between the links must be assessed. (see Exhibit I.1).

To achieve this objective, the strength of the individual and connected links must be in proportion to the value being protected. Hence, the need to understand the hierarchy from the value to the resources used to support the creation and delivery of value. This applies to all those you’ve entrusted to be part of your chain; they must manage the risk to the links with the same degree of diligence. The responsibility for managing risk to the supply chain extends far beyond the accountability of anyone’s function. But those responsible for designing and maintaining the strength of the links, that is, mitigating the risk, must do so by first agreeing on the value and then on the risk appetite. Once the risk expectations have been set, then the goal is to establish a common risk-conscious culture throughout the extended supply chain—one that provides clear incentives and penalties, and one that is not ruled by individual operating paradigms or static views of the risk profile. This is rarely the case.

Exhibit I.1  Supply Chain Hierarchy
The fact that so many people have not given serious thought to this reality is of great concern because it allows risks to permeate the organizational culture and behavior on all levels—internally (the organization) and externally (third parties). “It’s not my job” is a common answer to concerns raised about any number of problems, existing or anticipated, not due to the fault of the individual but merely inherent in functionally designed organizations, especially those with more than 1,000 employees. How many times have you heard “It’s not in my job description,” “It’s beyond my pay grade,” or “I think that’s someone else’s responsibility”? Unfortunately, our global economy is now dependent on far-reaching, interconnected, and interdependent supply chains—with an infinite number of single points of failure. The market, these “chains,” and all of the resources now exist in a world where extreme volatility has become the norm—where we witness wild fluctuations in energy, material, and commodity prices; geopolitical instability; increasing numbers of natural and weather-related events; and a constantly changing trade credit and financing market.

This extreme volatility directly impacts the supply chain by constantly shifting the network configuration, whether through a change to terms from cash payments to suppliers prior to shipping (versus a traditional letter of credit) or a change to the distribution strategy for which warehouses service customers. The need for financial discipline and rigor with regard to supply chain risk management and investment has never been greater. The days of rocky rides on roller coasters are over. Globalization has placed organizations on a supersonic rocket and launched them into deep space where many of the risks are unknown. We are now reaching a critical juncture, one that was highlighted by the World Economic Forum’s Global Risk Network in its “2008 Global Report on Risk.” For the first time, supply chain risk was identified as one of the top global risks. *Single Point of Failure* analyzes how the failure of one link, the failure of the interconnected links, and an abrupt shift in demand or supply (extreme volatility) could cause systemic failure. The book also describes why this growing problem is not isolated to a single company, industry, or country. I am hoping that you will gain insight from this book. After reading it, I believe that everyone will change their opinion and point of view and say, “It is my job” and believe that they really need to think about their own role in managing risk and promoting a risk-conscious culture.
I’ve broken down the discussion of supply chain management into ten basic laws. These are universally applicable to all supply chains and to all participants, on one or more levels. These are not academic concepts, theories, or mathematical formulas; they are the operational basis and management principles that define whether your organization’s supply chain risk program succeeds or fails. I begin by setting some ground rules in Chapter 1, “The Laws of the Laws.” This chapter demonstrates the basic truths and practical realities about supply chains and supply chain risk management and defines common assumptions and the initial rules everyone needs to have in order to succeed. For example, you cannot expect others to manage the risk to the supply chain unless there is something in it for them—incentive or penalty. I refer to this reality as “people always operate from self-interest.” So when an organization pressures its suppliers to cut costs, then they should expect the people of that organization to do so in a way that does not significantly impact their financial well-being. A cost cut to an already laser-thin supply chain will most likely result in a change to the risk profile, including the level of quality, service, and security. The balance must be struck between your risk appetite or tolerance and the opportunity offered by change. But one fact is certain: Everyone will operate from his or her own self-interests! I provide examples of this throughout the book, where best intentions turned into catastrophic single points of failure.

If the operating premise is wrong, so will be all subsequent efforts to fix these problems. While this might seem obvious as a mere statement, application proves that it is not quite so obvious. Without any doubt, you will be able to locate numerous examples of inefficient, expensive, and perhaps even dangerous systems within your organization, which have grown from a lack of definition in the first place.

As I expand into each of the ten laws, I apply “The Laws of the Laws” to each of the focused areas of discussion. I provide you with statistics, surveys, case histories, real-life examples, and conversations from organizational leaders who have experienced not only successful supply chain operation but, of equal value, have gone through the expensive disaster of systems that have failed.

The purpose to this book is to focus narrowly on supply chain risk management as an expansion of my previous book, *At Your Own Risk* (John Wiley & Sons, 2008), where I addressed issues
broadly for the risk-conscious culture of organizations. I use the term “supply chain” to distinguish a specific and comprehensive value chain described in my previous book—the flow of products/services, information, and cash. One important note: I use the term “supply chain” because of its universal acceptance (and, quite frankly, because of the way search engines are designed). However, this term is somewhat limiting. The supply chain represents the ecosystem of flows, relationships, infrastructure, labor, assets, technology, and process that drives the business. For most, it is the business—excluding the market and clients. As the supply chain concept evolved over the past decade, so did the opportunity to improve productivity, eliminate overhead, and speed the flow of goods and services.

Supply chains and supply chain management have matured and now represent the “business network” or “value chain” needed to support the innovation, creation, manufacturing, assembly, distribution, service, and disposal of product. So I will use the term “supply chain” as commonly accepted terminology and as a way of keeping everyone on the same script—one of the lessons I learned is the importance of common and standardized language to facilitate timely and accurate communication. My first book included detailed discussions and many, many examples of change and its impact; understanding the functional paradigms that served as the root cause for a certain decision (the way a function such as procurement or the external suppliers view their role in supply chain risk management); and consciousness as the beginning element of an action plan. While I discussed the supply chain in this context, the previous book was designed as an overview of the problems and solutions for operational risks.

This book shows you how everyone is involved in the supply chain itself, often on several levels at one time; how the footprint (the network) of the chain is exposed to an infinite number of constantly changing threats; how weak links in that chain represent threats and vulnerabilities (to profitability, continuity, safety, and health); and how those threats and vulnerabilities can be managed, reduced, and eliminated. This book is designed to address the concerns of executives responsible for overall operations; managers at divisional or even departmental levels (supply chain, procurement, logistics, risk management); employees; subcontractors (manufacturers and producers, outsourcing centers, and vendors, for
example); and department or section leaders involved in day-to-day operations or in specialized projects. In other words, because everyone participates in numerous supply chains, everyone needs to be aware of common problems and what it takes to support a pervasive, risk-conscious, and common supply chain risk philosophy.

Of course, the best-known examples of supply chain begin at the beginning—those industries that are closest to the raw materials or source of value. These industries include mining and minerals, energy, agriculture, and forestry. Without the natural resources—farms, fields, mines, rivers, animals, trees—there would be no opportunity to create value and enable the dependent industries, such as transportation, utilities, communications, life sciences, retail, chemicals, medical, and financial, to name a few. So, as we move upstream, closer to the source, the importance of managing risk becomes exponentially more important. On the other side of the equation, and equally important, is the demand, the market, and customers (and their organizations) whose chains touch the customer, patient, or the end buyer. These organizations wake up every day, relying on others’ chains to support the brand. Their chains are just an extension of others’ chains; however, they bear the burden of the brand risk. When those in the agricultural chain fail to manage risk and the result is melamine-contaminated infant formula, the hospitals and retailers are the ones on the front line with the media and the public.

This view of supply chains and supply chain risk management is referred to as the demand view—without the demand, there is, of course, no need for supply. Therefore, when we look at supply chains and their outputs, we must look at them in the context of the customer and markets or demand side of the equation (downstream). As customer needs constantly evolve, and in many instances change in unpredictable ways, the supply chain must be ready to respond by rapidly expanding or contracting capacity, especially in times of great volatility and tight financial markets. The decisions to do so have significant risk implications as described in this book. My point in *Single Point of Failure* is to demonstrate that those same lessons also have universal application, and their solutions have universal appeal. So a contract manufacturer in an overseas product factory actually is not dealing with unique or segregated problems; the processes at that plant exist as part of a complex supply chain, and an enlightened manager recognizes that the level of risk passes from there all the way up the chain—from