Counterfeiting:
An Omnipresent, Critical, and Yet Elusive Supply Chain Issue

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Anyone who has ever been offered a $40 Rolex or a $25 Gucci handbag understands that counterfeit goods are as accessible as hot dog vendors on the streets of any big American city. The problem is so prevalent that there’s even a word for it: Fucci, which means fake Gucci.

Counterfeiting activities are no longer limited to easy-to-produce luxury branded consumer goods. Over the last few years, they have evolved from localized activities to a global phenomenon that requires cross-national countermeasures on an industrial scale, at times with dire consequences. Aside from economic detriment, consumer safety is also at risk as counterfeiting activities are encroaching across a wider range of safety-critical products such as pharmaceuticals, electronic components, medical devices, and automotive and aircraft parts that are critical to their safe operation. Recently, The Wall Street Journal reported on the largest confiscation of counterfeit medicines in history when customs officials in Luanda, Angola, uncovered 1.4 million packets of counterfeit Coartem, a drug used to treat malaria. Just two years ago, the New York Times reported that at least 20 people were killed and dozens of others were seriously injured in the Czech Republic from consuming bootleg rum, vodka, and other spirits they purchased on the cheap at street kiosks. Laced with methanol to make the product stretch farther, the bottles bore fake labels from Czech liquor makers to fool the public.

Counterfeiting is not limited to Eastern Europe and emerging markets. In the United States, a recent report on counterfeit seizures released by U.S. Customs and Border Protection (CBP) indicates that critical technology components, electronic articles, batteries, and transportation parts now join the rank of top ten categories of counterfeit and piracy products seized by CBP in 2011.
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With the negative impacts counterfeiting has had on public safety, national economies, and the integrity of business supply chains, it is not surprising that the FBI labeled counterfeiting: “The organized crime of the 21st century.” As one executive points out: “Prior to the last year or two…[The knockoff parts market] has been the traditional fear around counterfeit parts for the custom- er. Clearly, over the last few years as the truly malicious applications have come to light, there is an expanded set of concerns.”

Among the underlying factors that have led to an increase in counterfeiting issues are the complexities accelerated by global supply chains and e-commerce that counterfeiters inconspicuously exploit for their own gains. What’s more, supply chains can play a vital role in combating counterfeiting.

Those are among the conclusions drawn from our study on counterfeit parts. Supported by The LMI Research Institute and conducted by the Center for Supply Chain Research (CSCR) at the Smeal College of Business at the Pennsylvania State University, this report describes counterfeiting issues focused on business processes and strategies related to business-to-business (B2B) sourcing of parts and materials. More specifically, by exploring a few key industries, the study objectives are twofold: (1) to investigate the characteristics of contemporary counterfeiting activities, and how and where they affect supply chains; and (2) to explore and report what companies are doing in response to the counterfeit parts challenge.

The objectives were addressed by conducting semi-structured interviews within industries where counterfeiting activities are prevalent, including aviation, automotive, electronics, life science, and defense, and then coalescing these interviews with an extensive examination of secondary sources including extant literature and industry reports.

The Hidden and Visible Impacts

The impacts of counterfeiting permeate the entire supply chain. Not only does it create conflict and undermine relationships among the supply chain members by exploiting the existing networks of legitimate supply chain entities, it inflicts damages in several aspects:

- **End users/consumers.** Users downstream are likely to experience premature product failures that can
increase down time, or worse, endanger users if counterfeit parts get into operations undetected. Even when a counterfeit lot is detected, industrial users can still incur the loss of manufacturing time and output while replacement parts or components are being sourced. In the case of pharmaceuticals, counterfeit items can put the customers' health and even their lives at risk. Consumers can also have their personal information and privacy compromised through counterfeit electronic components.

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- **Supplying firms.** Further upstream, suppliers who are the trademark owners of products being counterfeited suffer from the erosion of revenue stream and margin, deterioration of their brand value and reputation, lost investment, and reduced innovation. To any suppliers, which may or may not be the trademark owners, counterfeiting can raise failure analysis costs, mainly because it is increasingly difficult to distinguish counterfeit parts from genuine counterparts. Damages to suppliers also arise in the forms of countermeasure costs, fraudulent warranty returns, warranty costs, and the diminishing level of quality associated with their products or companies.

- **Buying firms.** Industrial users or distribution channel entities such as brokers, wholesalers, and distributors are not secure from harms and risks brought on by counterfeiting. On the one hand, suppliers facing counterfeit detriments are compelled to take extensive measures to secure their supply channels, the costs of which may be passed on to buyers through the increased selling price. On the other hand, to minimize the numbers of counterfeits that go into their operations or customers, buyers need to qualify suppliers and invest in additional staff as well as sophisticated equipment to inspect components. These efforts from buyers are vital to prevent legal action, because willful blindness by ignoring the potential for counterfeit items may be legally construed as deliberate intent that could create the risk of prosecution and legal liability, warned the Coalition Against Counterfeiting and Piracy.

**A Closer Look**

A wide array of activities fall under the umbrella of “counterfeiting.” The characteristics of these activities, parties involved, and strategies used to supply counterfeit products continue to evolve. Because various forms of counterfeiting tend to differ by the counterfeiters’ roles, their motivation, and the impact on affected parties, the first step in developing countermeasures is to distinguish between the various forms. Our investigation revealed the following five categories of counterfeiting.

1. **Gray-market counterfeiting** entails the activities of production overrun and parallel trading. Production overrun is an umbrella term for any form of unauthorized production by otherwise authorized contractors. For example, a contract manufacturer may operate an unauthorized additional production shift of a product to sell on the gray market. Parallel trading is a diversion of legitimate products to markets, dealers, or retail outlets without the consent of the right holders.

2. **Re-marked/re-packaged counterfeiting** involves re-labeling or re-marking of the original products with a newer date code, with a completely different product ID, or as a higher performance, more expensive product. Also in this category are falsified certificates of conformance and safety approval documentation to construe that parts have been tested or screened to a higher standard than is true.

3. **Green-market counterfeiting** is the misrepresentation of sustainability characteristics (e.g. reduce, re-use, re-work, refurbish, reclaim, recycle, re-manufacture, and reverse logistics).

4. **Hard to find and surplus counterfeiting.** The former is common for long-life, tailored products or systems (e.g. automobile, defense and aerospace companies, and industrial equipment manufacturers) where out of production critical components or spare parts are highly susceptible to being counterfeited. The latter involves unauthorized “back door sales” of excess inventories to minimize loss from leftover items and inventory cost associated with the excess inventory.

5. **Illegally acquired counterfeiting** encompasses smuggled and stolen products.

**Supply Chains: A Counterfeiter’s Playground**

How do counterfeits get into the supply chain? Unfortunately, there is not just one “door to shut.” Exhibit 1 provides a simplified illustration of typical
counterfeiting activities and points of supply chain infiltration.

As can be seen in Exhibit 1, counterfeiting issues have become increasingly complex and challenging to overcome, primarily because their supply chains are difficult to distinguish from the genuine supply chains. The underlying reason for this phenomenon is twofold: the complexities of today’s global supply chains; and the sophisticated concealing strategies exercised by counterfeitters.

In fact, the growing volume of freight that flows between countries via a complex network of intermodal freight transportation by itself abets counterfeiting. Counterfeit goods are moved via multiple modes of transportation, and are transshipped through various intermediary destinations in several territories. This strategy disguises the origin of the counterfeit products as they traverse along the global supply chain.

Various concealing strategies counterfeitters employ also complicate counterfeit goods identification. According to the United Nations Interregional Crime and Justice Research Institute, counterfeitters’ tactics range from mixing counterfeit and legitimate products into the same shipment; shipping parts and subassemblies rather than finished counterfeit products; to stealing the corporate identity of legitimate importers in order to import counterfeit products. It is important to note that the corporate identity theft strategy has become more prevalent. One of the common schemes used is physical address mirroring in which a corporate identity thief closely mirrors the physical address of the unsuspecting target business in order to obtain credit, loans, or order goods and services in the victim business’ name. Smaller customs brokers and forwarders are used most often to carry out such a scheme, because unlike more sophisticated operations, they do not have procedures in place to vet new customers, according to The Journal of Commerce. All of these concealing strategies not only reduce the risks of seizure upon entry, but also allow counterfeitters to avoid criminal liability if counterfeit goods are detected.

**Countermeasures to Combat Counterfeiting**

Companies are executing various anti-counterfeiting initiatives that address different points in the supply chain network, shown in Exhibit 1. These initiatives can be broadly described as detect-and-deter approaches designed to improve detection of counterfeit parts and institute barriers to deter counterfeitters. The goal of these approaches is to prevent counterfeit parts from getting into the operations or in the hands of customers, as well as minimize the counterfeiter’s opportunities to infiltrate the legitimate supply chains. Exhibit 2 provides a snapshot of current proactive anti-counterfeiting initiatives as found in our research. Based on this framework we discuss seven countermeasures.
Counterfeiting

Countermeasure 1: Focus on Counterfeit Part Intelligence

“One thing about the counterfeit world you hear a lot of clichés... and the biggest one is ‘we don’t know what we don’t know,’” Vice President of Global Brand Protection, Life Science Manufacturer.

Because data on counterfeit incidents have not been systematically collected or evaluated, companies have been forced to rely on fragmented and anecdotal information to develop anti-counterfeiting programs, noted the U.S. Government Accountability Office. As a result, proactive companies are now focusing on developing counterfeiting intelligence to fill these information gaps and create more effective anti-counterfeiting programs.

Creating a robust database that is continuously maintained is the first step for intelligence building. The database contains information on counterfeit incidents gathered via various avenues, ranging from internal reporting of counterfeit parts detected, conducting supplier site assessments, collecting customer input, to engaging in the investigation and prosecution of counterfeiters. With this information, tools such as supply chain mapping and network analysis assist in a risk assessment. Focuses of the analysis are on identifying at-risk procurements, most likely points of infiltration or unintended dispersion of counterfeit parts, the parties involved, and the nature of the risks and impact of counterfeit parts. Intelligence developed, in turn, provides actionable inputs for devising risk-based anti-counterfeiting strategies.

Countermeasure 2: Use Risk-Based, Multi-Layered Approaches

“There is always a trade-off between combating counterfeit items being introduced and the subsequent cost of doing that combating,” Director of DoD Supply Chain Solutions, Defense Consulting.

Risk-based anti-counterfeiting strategies are based not only on potential associated risks, but also the propensity for particular parts or products to be counterfeited. Some red flag characteristics that spur counterfeiting are the difficulty of counterfeit detection, obsolescence or out of production, high value, and high demand volume. Driven by high potential revenue gains, products with high value and/or high demand volume are often susceptible to being counterfeited. Revenue-driven counterfeiting is further propelled when products are low-tech, easy to imitate, have no harmful effects that will raise suspicions, or involve resource-intensive verification owing to difficulty of counterfeiting detection. The lack of supply for obsolescence or out of production products from authorized channels with established relationships and audit trails necessitate buyers to seek the supply elsewhere, opening opportunities for counterfeiters.

Another key feature of risk-based strategies is that they span across forward and backward supply chain processes, and employ multi-layered measures of people, process, and technology. The constituent elements of these multi-layered strategies include the emphases placed on trusted/distrusted parties, authentication technology applications, and internal line of defense through robust inspection, market sensing and reporting procedures.

Countermeasure 3: Identify Trusted/Distrusted Parties

“What you want to do is make sure that you got trusted partners who are audited on regular basis... you have to get your suppliers committed with the same rigor that you have as a company,” Vice President of Global Brand
Combating Counterfeiting in the Supply Chain: Five Pieces of Advice

The issue of counterfeit parts and products is widely recognized today as a matter of corporate, government, and public concern. In this article we describe counterfeit part supply chains and infiltration strategies that counterfeiters use in the global trade environment. The complexities of counterfeit challenges gauged from this exercise accentuate the need for proactive countermeasures. In conclusion, we offer the following five “quick fixes” for practitioners in developing and implementing anti-counterfeiting measures:

1. **Cultivate counterfeiting intelligence.** Start with developing intelligence on the issues and build a robust database over time to reduce the “we don’t know what we don’t know.”

2. **Keep in mind that not all counterfeit parts are created equally.** Anti-counterfeiting efforts should be proportionate to the propensity of counterfeit incidents and potential risks involved by parts or products, by channel of trade, and by geography.

3. **Know your supply chain partners.** Make sure that your supply chain partners not only steer clear of counterfeiting activities, but also actively deter counterfeiters from infiltrating the supply chains.

4. **Look out and look around.** Bring in external reinforcements to build a better protective supply chain through participations in anti-counterfeiting coalitions and taskforces that facilitate communications and collaborations on regulations around anti-counterfeiting measures, protocols written based on these regulations, technological standards, and best practices.

5. **Strengthen from within.** Bring in internal reinforcements through organization-wide culture and policies, and cross-functional actors who are trained and equipped with appropriate tools.

**Countermeasure 4: Employ Authentication Technology Applications**

“Anything you do to increase visibility and control of your supply chain, it’s going to be better for protection against counterfeits...Technologies with authentication, track and trace, wireless technologies are very important,” Vice President of Global Brand Protection, Life Science Manufacturer.

Various authentication technologies are implemented to enhance counterfeit detection, part/product authentication, and return verification. The majority of current technological responses involve the use of primitive, relatively inexpensive marking options such as serial numbers, holograms, and micro-printing. More advanced marking technologies such as chemical or artificial DNA sequence markings are also used, but to a more limited extent.

While users perceive some gains from these detection technology applications, it is to protective traceability technologies that proactive anti-counterfeiting programs aspire. RFID-enabled technologies in particular have gained attention in anti-counterfeiting efforts. However, they remain relatively limited in use, primarily because of the high cost and lack of technological standards. This combination inhibits system-wide implementation of traceability technologies for the sole purpose of anti-counterfeiting.

**Countermeasure 5: Strengthen the Internal Line of Defense**

“What you want is a continuous inspection of product, where not only is the quality inspected, but there is inspection around the compliance, the volume, quality, delivery schedules, and packaging. All the evidence you can find on
a shipment coming from a supplier would match what you would expect,” Vice President of Global Brand Protection, Life Science Manufacturer.

Robust inspection procedures are a vital element of keeping counterfeit parts from entering a firm’s operations. Emphasis needs to be placed not only on processes for physical inspection of parts, but also for accompanying documents. Like forward flows, reverse flows of returns, disposal, and surplus items should also be focused on because some products/parts that should be disposed of or processed during the return process increasingly end up in the counterfeit supply chain.

Also important in the internal line of defense are specific procedures for handling counterfeit parts and reporting detection of counterfeit parts, as well as marketplace sensing for counterfeiting activities, such as through complaint handling (to pinpoint parts failure trends, or suspicious changes in failure rates), sales and inventory monitoring (to identify sudden spikes in orders that could indicate illicit trades), and Internet monitoring (to identify unauthorized trades).

Employees should be trained and equipped with appropriate tools (e.g. authentication technologies described previously) to enhance their abilities to detect, identify, and sense counterfeiting parts. The information gathered, in turn, will assist in developing counterfeit part intelligence, provide feedback to customers, and assist government agencies in addressing the counterfeit issues.

Countermeasure 6: Capitalize on External Reinforcement Through Collaboration and Information Sharing

“We need to act together as an industry to make sure that what we see collectively is properly communicated . . . around anti-counterfeiting measures, around technology on tracking and tracing to try to homogenize the industry [and] to share what has been successful . . . to build better protective measures to supply chains,” Vice President of Global Brand Protection, Life Science Manufacturer.

Because counterfeiting is a relatively “immature” issue, collaboration among private companies, government and non-government agencies, and industry groups is imperative to develop industry insights and keep abreast of accepted standards and protocols. Companies with effective, proactive anti-counterfeiting efforts actively participate in a growing number of associations, both industry-specific and cross-sector, that are established to promote information sharing and working dialogue in the effort to fight against counterfeiting.

Examples pertaining to industries where counterfeiting activities are prevalent are Brand Protection Council (the motor and equipment industry), Rx-360 consortium (the pharmaceutical industry), Government-Industry Data Exchange Program (the defense industry), and Alliance for Gray Market and Counterfeit Abatement (AGMA) (the high-tech industry).

Countermeasure 7: Achieve Internal Reinforcement Through Organization-Wide Culture and Policies

“We won’t tell the business area this is exactly how you do it [approach counterfeit] because every business is different, and their businesses are different, but they will have to follow the same basic approach and come up with the same results as everyone else in the corporation,” AIT Manager, Aerospace Manufacturer.

This article underscores a company’s established, unifying stance toward counterfeiting. High level and broad reinforcement is important, not only to facilitate the counterfeit part intelligence efforts, but also to effectuate the implementation of risk-based anti-counterfeiting strategies.

Because anti-counterfeiting initiatives described earlier have a direct bearing on supply chain processes, they must be accompanied by appropriate education and training programs not only with employees, but also with supply chain partners, consumers, and government officials. These programs aim to raise awareness of counterfeiting risks and the countermeasures being put in place in terms of the general policies, the specific procedures, and the governing rules, among others.

More to Be Done

What then can be done? Counterfeiters are aggressive and creative in their endeavors—companies must match these efforts in the same manner (see Five Pieces of Simple Advice). Some of that work is already under way: As the risks of counterfeiting have intensified, an increasing number of companies are initiating various anti-counterfeiting programs. However, until recent years, counterfeiting issues have been conversed passively among supply chain managers, often as a small part of risk management and security issues. That needs to change. While different functional areas need to be involved, we believe supply chain should lead the charge as that is where many counterfeiting activities occur. At minimum, supply chain needs to be the “start of the conversation” within many firms, a conversation that either is long overdue or should become louder.