Uncovering Risks in the Pharmaceutical Industry: Exposing Theft in the Supply Chain

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Abstract

With thousands of domestic theft issues within the U.S. annually, it is critical for all supply chain professionals to have a deep understanding of the threats that the company faces as inventory moves from one location to another in the supply chain. Theft within the pharmaceutical industry is a growing problem that has been gaining more attention over the past few years. The value of the products and the potential harm that may result from a theft makes this industry sector particularly sensitive to the issue. In this thesis, I combine secondary data with qualitative measures to develop a comprehensive assessment of the current state of supply chain risk emanating from theft. Through the movement of Product X, a fictitious pharmaceutical drug, the risks at various points within the supply chain are revealed. The results show that logistics and supply chain managers face numerous vulnerabilities within the supply chain, and the greatest source of error comes from a lack of understanding and preparedness regarding security on the part of organizations. These findings will provide industry professionals with a greater breadth of understanding of the supply chain, and offers further insight into tools that can be implemented to combat the threat of theft and pilferage within the supply chain.
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Introduction
Theft is an old problem. For many, the idea of theft has been romanticized, whether it is actors like George Clooney and Brad Pitt robbing a casino in the popular *Ocean’s 11* movie series, Mark Wahlberg victoriously hijacking a safe filled with $35 million in gold in *The Italian Job*, or Pierce Brosnan deceptively executing an elaborate plan to steal a specific work of art in *The Thomas Crowne Affair*. The truth is that many of the reported thefts don’t require breaking into a vault in a casino; rather they require a small amount of common sense. In the U.S., sixty-three percent of cargo thefts occur in unsecured lots, over holiday weekends, and are idle targets waiting to be stolen (FreightWeight International, *Annual Report*, 2011). In the pharmaceutical industry, numerous thefts have incentivized companies to spend millions to protect themselves, when in reality looking at the statistics could significantly reduce their vulnerabilities.

To the average consumer, going to a convenience store to pick up a pain reliever is a quick and relatively simple decision. However, for many consumers, the complex process for how that product arrived on the shelf is a complete mystery. The scary part is that it might also be a relatively unknown process to the company that made the product as well. In addition to a fear of products disappearing out of the supply chain, there is also a looming fear of them reentering the chain either illegally or through falsified labeling and documentation. Problems similar to this are unforeseeable and companies have to anticipate future risks in order to protect their customers and their brand.

The pharmaceutical sector, in particular, has gained a heightened sense of attention for cargo theft and is under a great amount of pressure because of the potential high risk for repercussions. Due to the smaller shipping volume and high street value of these products, pharmaceuticals are prime targets for criminals who could turn around and sell the goods on the black market for a quick profit. The average per-incident loss value for pharmaceuticals was
measured at $3.78 million, the highest of all products, followed by tobacco at $1.26 million, accounting for less than half of the value (FreightWatch Global Assessment, 2011). However, it should be noted that the pharmaceutical sector has been protecting its supply chains since 2005 on a national level. Yet close to $185 million dollars were stolen in both 2009 and 2010 (Insurance expert, phone interview, September 5, 2012).

Supply chain security has been an area of interest for practitioners and academics for some time and particularly since 9/11. On the academic side, the research has ranged from evaluating the state of supply chain security to determining ways to enhance it. Closs and McGarrell (2004) were among the first to formally define the concept of supply chain security management. They characterized it as the:

“[…] application of policies, procedures, and technology to protect supply chain assets […] from theft, damage, or terrorism, and to prevent the unauthorized introduction of contraband, people, or weapons of mass destruction into the supply chain.” (p. 8)

Williams et al. (2008) note that before 9/11 management’s focus was on keeping product from leaving the supply chain. After 9/11 the emphasis shifted to keeping contraband out of the supply chain. Both issues have become a critical factor for businesses and government agencies since 9/11 as measured by the number of articles, conferences, technology applications, and businesses devoted to this matter – to name a few. Yet little empirical research supports policy or practice for the field (Williams et al. 2008).

While research exists regarding supply chain security at a macro-level perspective, there are few studies pertaining to specific industry sectors on this topic. One of the most complex and potentially high risk supply chain can be found in the life sciences (pharmaceutical) industry. Running a fully functioning supply chain for this industry sector has numerous difficulties.
Conditional measures, such as legislation, temperature control requirements, and heightened security, complicate the chain and add to the already complicated system of touch points.

In an effort to better understand the complexities and the range and scope of supply chain risk in the pharmaceutical industry, this research will examine a few targeted positions in the supply chain for purposes of exploiting their vulnerabilities so that thefts can be better explained and companies can develop action plans to protect themselves from avoidable thefts. The study examines the supply chain risk that shippers and carriers are exposed to as their products flow through it. A hypothetical product (Product X), which is an example of a popular, addictive, and effective pharmaceutical prescription drug, will be used as the basis to describe how risk occurs.

The research addresses two main questions: 1) Where are the main vulnerabilities within the supply chain with regard to cargo theft, and 2) What can be done to moderate these security risks, i.e. loss prevention.

**Research Approach**

The main purpose of this thesis is to develop a comprehensive assessment of the current state of supply chain risk emanating from theft. This will be accomplished through the use of multiple methods including: multiple interviews with executives and supply chain professionals, and an extensive review and compilation of relevant material from books, annual supply chain industry reports, industry white pages, published public cargo theft reports, newsletters from a leading freight security company.

Due to the nature of pharmaceutical theft, there is a vast amount of subjective experience and perspective. Therefore, the research concentrated on interviews with industry experts, field
notes and general communication with pharmaceutical company employees. In addition to determining why pharmaceutical theft has become the threat that it is currently, the thesis uses secondary data to gain a compile a broad assessment of the supply chain risk and provide insight into future action. While there is already an immense library of research available to industry experts and professionals, there is no source that combines these studies.

The thesis is organized as follows. The first major section discusses the physical supply portion of the supply chain and explains the production of the hypothetical Product X, as well as an overview of the international movement of the product before it enters into the domestic supply chain. The second section looks at the various freight modes for domestic transportation. The subsequent section focuses primarily on the impact of idle products in warehousing, and the heightened risk associated with products not in motion. The thesis concludes with a fourth section that reviews the repercussions of theft within the pharmaceutical industry and how organizations are beginning to combat such occurrences. Each position examined in the supply chain will include a discussion of hypothetical situations or real evidence of theft and how the industry has fought back through technology innovations, and the efforts of third party companies auditing and implementing proven effective measures.
Assessing Risk in the International Portion of the Supply Chain

International Transportation

Over-the-counter (OTC) as well as prescription drugs become finished goods through a multiple-phase process. In the case of Product X, there are several steps that have to be taken in order to get the finalized product in the hands of customers. Regardless of what process is used, the physical supply chain for all products begins with the procurement of the raw materials that are needed to make said product. A full understanding of the customs and security protocols for various countries is needed. In choosing which method of transportation is the best for a particular product one must consider the amount of time the product can be in transit and the amount of money you are willing to invest in that process. For many, containers are the most economically feasible way of shipping mass quantities overseas; however, there is still a large market for airfreight which can greatly affect the efficiency and speed of a supply chain. Even though these two specific modes of transportation are relatively safe, there is still a great deal of risk before the product gets on the container or airliner and after it is removed. In addition, there is risk in the customs process, which can be extremely tedious and expose a product to immense risk that had previously not been considered.

It is possible, however, to design a supply chain that incorporates risk exposure. The data presented in Exhibit 1 provides a county-level assessment of overall risk and is an example
of the available resources and tools that can help with the planning and design of a supply chain.

If the supply chain is already developed, learning about countries’ vulnerabilities will help to develop stronger information to improve the supply chain safety.

**Raw Materials**

Product X begins its supply chain journey in the heart of a developing Latin American country. It is a natural synthetic element that is a critical part of the production process. This element is then transferred out of the country to a facility in Western Europe. Here it meets plant extracts from the Middle East and formulas from the United States. From here these ingredients are manipulated, tested, and blended into a final product. At this elementary composition, Product X has already endured a significant level of risk ranging from corruption of inspectors to leakage of trade secrets.

In order to remain ahead of the looming industry competition, it is critically important that the product be created, tested, and mass produced in a manner that maximizes the return for
given the research investment, including the hours of research invested. There is an increasing
need to retain high levels of raw materials within the supply chain for pharmaceuticals. The goal
is instinctively to hold onto those materials in raw form as long as possible without actually
creating the product. The time and energy spent making OTC medications can sometimes be
extensive. If the demand on the shelf is low, having excess inventory has a negative effect on the
profitability of the company. However, leaving the goods unfinished can provide excess
flexibility for the company as well as a buffer against unpredictable instances in the market such
as a recall. While the benefits seem to be numerous, leaving goods in their raw form can have
detrimental consequences.

In order to understand the true value and inherent risk of Product X one must take into
consideration the mode of transportation and the process involved in clearing a material through
customs. Each of these will be discussed in the following sections.

**Container Cargo**

As mentioned, container cargo is relatively safe except for that portion of the move when
the freight is at rest – the loading and offloading processes. The critical considerations related to
risk are the departing and destination cities for the cargo. Supply chain flow disruptions can
originate from many different complications from disgruntled unions to international pirates.

In 2012, many companies shipping into or out of ports along the western United States
cost feared that negotiations for salaried port employees would not be successful leading to a
halt in operations. This type of disruption would be significant as the port in question represents
40% of the value of goods imported into the US (McWhirter and Martin 2012). The risk of
strikes or disgruntled employees has the potential to severely impact trade and commodities
markets as they could lead to stalled container ships waiting to berth at the port.
An occurrence that FreightWatch International highlighted as a threat for ocean shipping is the uprising of piracy. Dated March 27th of 2012,

“[A]n Iranian-owned cargo ship was hijacked in the Maldives’ waters on March 26 by Somali pirates. The 23-person crew is being held in the Indian Ocean and was carrying Brazilian sugar. The Maldivian National Defense Force and the Indian Navy are tracking the vessel, which is the first to be hijacked by Somali pirates in the Maldives. The ship was seized more than 1,250 miles off the coast of Somalia. As ships travel further east of the Somali coast in an effort to avoid attacks, pirates are following.”

Although these incidences are in remote areas, it is important to be aware of circumstances that have previously been thought of as only in the imagination. These individuals, mostly comprised of Somalian pirates, are responsible for various attacks which involved hijacking ships and containers as well as holding vessels hostage in the Maldives, an island nation located off of the south-west coast of India. These incidents prove that regardless of how safe container shipments are, there is always a looming fear of thefts. This threat has led transportation experts to avoid steering vessels through the Suez Canal region, if it can be avoided. Currently the Suez Canal hosts nearly 20,000 shipments annually and the volume continues to increase, because avoiding the canal results in a 6,000 mile detour around the Cape of Good Hope, increasing both cost and shipping time (Pike, 2011).

While every material will not face the threat of Somali pirates, it is important to realize the varied threats that are imposed when a material or product is sitting on international waters and how little control the shipper or company receiving the product has over this part of the supply chain.

**Air Cargo**

For materials and goods that are purchased from international suppliers, air freight may be unavoidable. For many goods, time restrictions require expedited transportation despite its
high costs. In late 2011, FreightWatch International reported two men in Singapore for allegedly receiving stolen property:

SINGAPORE: Police have nabbed two men believed to have dishonestly received stolen property worth about $1.4 million. The arrest followed a report made by an air cargo agent about a pallet of cargo containing some 3,400 pieces of electronic devices, stolen from the Cargo Terminal in Changi Airfreight Centre (CAC).

Events like this are rare, but the lack of security exemplified here reveals the risk at each touch point within the supply chain. This is especially true when the third party expecting the cargo experiences no responsibility for the loss of the product. Although the company shipping the goods had little control over the physical movement of this shipment, there is value in researching the carriers that you use for transportation and ensuring that their security rating meets set expectations.

In February 2013, another incident of poor security at an airport emerged when a multi-million dollar diamond heist occurred at an airport in Brussels. The event proved that there is virtually no conceivable way to protect even the most valuable goods. In this case, $350 million in jewels simply walked away quietly through a damaged fence.

What is important to keep in mind is that thieves have adapted their strategies to target the weakest links in the supply chain, like a weak fence. In these incidences and in many others like it, the facility where the product was received most likely lacks modern and up-to-date video surveillance systems and security screens. Since a large percentage of the raw materials used in pharmaceuticals originate from BRIC (Brazil, Russia, India and China) developing nations, it is important to realize the level of risk that exists due to corruption and lack of surveillance in the air transportation facilities in those countries.
**Customs**

Imagine Product X, still unmanufactured and in its raw material form, entering Customs in large brown sacks, weighing as much as 3000 lbs., one per pallet (Access Business Group). An image similar to this one probably looks suspicious for any official who is merely checking off boxes on their list in order to ensure that a product is safe, and meets the criteria, to leave a specific country. Next, this Customs official opens the sack in order to check that the material is valid and safe for transport. This scenario, although plausible, just opened Product X to hazardous airborne conditions. Further, it has contaminated the entire sack which is now unsuitable for manufacturing purposes.

Not only is the Customs arena complicated for companies to understand, but with the magnitude of volume that is entering and leaving ports on a daily basis, it is human nature to accidentally misread a label or move the wrong product. For the pharmaceutical industry this could pose huge problems. So much so that companies are forced to destroy all tainted materials. Destruction is mandatory because the materials have been exposed to the elements, and there is increased risk and liability of the materials being tampered with. The risk and liability occurs at this point and it can continue to have negative repercussions down the supply chain potentially increasing in size and scope of magnitude. This scenario assumes the customs agent’s motives were honest. However, this is not always the case.

One solution that many companies use is Customs brokers. Customs brokers are hired to increase the momentum of a product or shipment through customs. There are extensive international rules and regulations that must be followed before goods can enter and leave a country. Brokers have the knowledge to handle the complexity of import and export issues, and are qualified to assist in the process of moving the goods. With this increase of information and knowledge, however, comes the double-edged sword of an excess touch point within the system.
This additional process could be considered an increased liability for the supply chain based on the credentials, or lack thereof, of the broker. Generally, brokers serve as a solution to complex customs processes.

Assessing Risk in the Domestic Portion of the Supply Chain

Domestic Transportation

It is extremely important to understand current transportation trends even if the company in question is merely a subsidiary of an international company with operations primarily in the U.S., or if the company solely operates within the U.S. The transportation index, which is a measure of the number of domestic cargo freight shipments on tractor trailers, continues to rise since the recession. Within the last two years the upward trend has seemingly stabilized at around 10,000 annual freight shipments monthly (Exhibit 2). According to FreightWatch International’s U.S. Cargo Theft Report in 2011 there were nearly 974 incidences of reported theft or tampering at a rate of nearly two and a half incidences per day.

Exhibit 2: US DOT Bureau of Transportation Statistics

The above graph gives a detailed month by month analysis of domestic freight shipments. This serves to reveal the number of shipments on an annual basis and benchmark against the number of thefts that are reported, not all which actually occur, on an annual basis. http://www.rita.dot.gov/bts/press_release/bts007_13
This equals nearly 10% of all shipments. Not only is this rate alarming, but if companies do not take a proactive approach to stemming this growing epidemic it will continue to add to the multitude of weaknesses in the supply chain.

In today’s current market, very few businesses are truly isolated from the outside world, especially the pharmaceutical industry. Because the raw materials for pharmaceuticals are not domestically available and must be sourced and transported internationally into the U.S., the goods spike in value because of their rarity.

The next segment of the paper will concentrate on the U.S. domestic transportation modes and the role they play in supply chain risk related to theft. Domestic transportation continues the supply chain process once the container of Product X comes into the U.S. The challenge, along with the risk of thefts, continues to increase.

Motor Carrier
Imagine you are a transportation specialist or manager for a pharmaceutical company. On Monday morning you receive an email stating that a well-known cargo-theft ring leader and his/her crew has left Miami, Florida, which is a hub for cartels and cargo thieves. The ring-leader is believed to be heading to the Midwest in a specific car with a “bob-tail” tractor (a tractor with no trailer attached). Knowing this particular group has been suspected for multiple pharmaceutical thefts in the past, you begin to question your vulnerabilities and wonder what facilities in the Midwest could be a target for the thieves. The email also states that this group was never apprehended although they have been suspected of multiple incidents, including one incident where they were painting over a logo on a truck. Even with all of these facts stacked
against them, there is still not much leverage that law officials have to persecute these individuals. So what can be done to change this?

Two days later, on Wednesday morning, another email appears in your Inbox referencing the suspect van and bob-tail in question. Now this group has been sighted in the Midwest, just as the initial email had projected, and they are miles from a facility where you source pharmaceutical products. From here you can contact any carriers transporting your product to alert them of the updates and put all trucks outbound on high alert.

Information such as this has revolutionized the way companies look at security, much like exhibit 3, which emphasizes the major areas of concern domestically for freight shipments. The best way to catch criminals is through information. However, the skyrocketing effects of theft on insurance and the negative publicity generated by these thefts have become too great a liability for some companies, who still opt to write-off the violation and not report the incident.

Exhibit 3: Cargo Theft Incidences 2010

This map of the United States, provided by FreightWatch International, pinpoints various locations in the United States that proved to have higher numbers of theft incidences. Regardless of the materials that were reported stolen, this trend shows that transportation specialists need to be under a heightened sense of security when transporting materials throughout the eastern corridor of the United States.

Motor carriers are responsible for 70% of all domestic freight shipments. As such it has become nearly impossible to avoid using motor carriers at some point within the supply chain. Once a product comes into the country, it is highly likely that it will be placed on a truck and taken to a holding facility. Motor carriers are a massive industry employing 8.9 million people in trucking related jobs, some 3.5 million of which are professional drivers that operate 15.5 million trucks designed to move product for companies with speed and at a competitive price (Bureau of Transportation Statistics, 2009). Due to this level of competition, and the strenuous job descriptions, the market for truck drivers has deteriorated. Currently, the deficiency of professional trucker drivers is compelling companies to choose between decreased levels of service and protection in order to remain efficient (reference to Noel Perry article). Despite the decline in professional drivers, the industry still moves $671 billion in U.S. goods, not including $490.6 billion in truck trade with Canada and Mexico (Truck Info U.S. Statistics).

With the background for motor carriage in place, let’s return to the scenario of the cargo-theft ring leader from Miami who is now in the Midwest. Change the scenario to one where the truck driver had not been put on high alert. This has now put all Product X shipments leaving this facility at high risk. Organizations like FreightWatch International have come up with a list of options for companies and drivers to follow in an effort to protect themselves from theft even in these high-risk situations.

The primarily rule FreightWatch encourages organizations to follow is the 200 mile rule. An estimate reported by FreightWatch International states that the majority of motor thefts occur within the first 200 miles of departure from the warehouse or holding facility of the shipment. Drivers and driver-managers with the use of technology have a very good estimate of the time that it will take to move a shipment from one point to another, even accounting for all the
regulations pertaining to the amount of time that is acceptable for a driver to be on the road and how much time they must rest between shifts. More often than not, drivers are given a larger time estimate that allows more latitude than necessary to deliver a shipment. This enables a driver to do things like have a shower or a meal, or both, especially after just completing a long shift. For a driver, a shower at a familiar rest stop near the beginning of the route is an attractive idea so he/she can get right back on the road quickly in a refreshed state. This mentality is extremely flawed for multiple reasons. The first being that the freight is now left unattended. Second, due to the increasing cost of diesel, many drivers leave the tractor running idle, meaning that the keys remain in the ignition. Third, the threat is escalated by the fact that thieves are smart and innovative; they understand the driver’s mentality. With all of these factors melding together, the truck of unsecured Product X has become the proverbial sitting duck and a prime target. By the time the truck driver has returned from his/her shower or hot meal, the tractor-trailer is long gone.

As obvious as the vulnerabilities are on paper, this exact scene has played out numerous times at rest stops all over the country. No matter how smart the driver is behind the wheel, small oversights can add up to become a multi-million dollar problem. Another option is to have a team of drivers work together to transport a shipment. Take into consideration the value of the shipment that is in transport (exhibit 4), with the high value of pharmaceuticals compared to other shipment materials, companies have to heighten their awareness and be prepared for theft. With a pair of drivers, one could rest while the other drives. Alternately, if stopped, one could stay with the freight while the other driver ran into a rest stop. Although this eliminates some problems, others are created. With the driver shortage problem increasing, using two drivers for a single shipment is not always a viable option. Sometimes a pair of drivers is not the solution a
company thinks it will be regarding cargo theft. Consider what might happen if the pair of drivers is a married couple. While they are good at dividing the responsibilities of the road, they may choose to go inside to eat a meal and leave the load unattended, subjecting it to a potential loss. Although vulnerabilities are unavoidable, many companies have also adapted to provide better protection for their assets.

Exhibit 4: Cargo Theft Volume v. Average Value per loss

Imagine the worst possible outcome of the scenario introduced earlier - the load of Product X has unexpectedly changed drivers and is now in the hands of thieves. Usually there is little that can be done to locate the truck and regain possession of Product X before there is any damage done or the security seal on the trailer is broken. In order to increase the speed of acquisition of these rogue trucks, many companies are implementing internal satellite technology or global position systems (GPS). In addition, readers can be placed on the inside of a pallet and shipped along with the product in an effort to watch its exact movements. Another option is
SteelSafe’s Truck Immobilizer. This device can be tailored to the needs of the product owner, and even more importantly it has the ability to prevent theft and then stop it if that should that happen. If a shipment is reported stolen, this technology will gradually release air from the tires of the truck in order to reduce an accident that could be caused by abrupt stopping. It will also immobilize the trailer, coupled or uncoupled from the tractor, so that it is unable to be moved by another truck or trailer.

Software in the fleet management arena is experiencing growth year-over-year due to companies realizing the potential cost savings, and headache reduction, that it provides. By understanding how to improve fleet productivity and read the indicators represented in the data, software, like Collective Data’s fleet management software, allows companies to make more-informed transportation decisions.

**Rail**

For many countries around the world, rail has maintained a strong presence as a means for transporting people and goods. The U.S. has maintained a strong freight rail transportation system that is the largest rail infrastructure in the world. On the other hand, passenger rail services have fallen dramatically to become almost nonexistent, outside the Northeastern Corridor. Rail freight is used for the movement of raw materials domestically, and especially, into and out of Mexico and Canada. Rail can be used to transport products or materials with extensive shelf-lives at a cheaper rate than air or motor carrier. An analysis by FreightWatch International (Burges 2011) indicates an increased concern with the protection of freight moving by rail in Mexico. In addition, recent incidents reported by FreightWatch International are able to give companies a greater understanding to the breadth of this issue. Exhibit 5 presents an
example of the type of communication that the company provides its customers. The level of
detail in the Theft Report provides companies with specific, actionable information.

Due to the streamlined process of transportation, goods remain in motion after they have
been placed on the bed until they reach their destination. This constant motion keeps goods much
safer than motor transport. Another highlight of this mode is the decreased threat of damage.
Trains don’t have near the accident rate of truck drivers however they also are not responsible for
the quantity of goods that the motor business transports on an annual basis.

**Warehousing**

Anytime products are not in motion there is an increased threat of vulnerability. When objects
are still in an enclosed warehouse or distribution center it takes far greater ingenuity on the part
of the thieves to maneuver a break in and successfully extract product. The risk here lies in the
increased potential for large scale theft.

Exhibit 6: IBIS World Warehousing Industry at a Glance


*Above is a snapshot of the Warehousing industry. This shows the revenue, annual growth, profitability, average wages and number of businesses within the industry, in order to provide a realistic snapshot of the current market.*
A snapshot of the warehousing industry (Exhibit 6) indicates that it has been growing steadily over the last 6 years. This growth is attributable to the demand from manufacturing, wholesaling and retail trade. With increased pressure on the economy, logistics networks have been vertically integrating and pushing for shorter lead times. Door-to-door transport and distribution services minimize the idle time of goods in warehouses. Even with major advancements in technology, such as voice recognition and radio frequency identification (RFID), the warehousing sector of the supply chain generates the majority of large scale thefts in the pharmaceutical industry.

The reasoning behind this vulnerability is due to products being left unattended for the majority of time that the product is in the system. Considering Product X, and other pharmaceuticals, their small packing size and high value per pallet makes these goods highly sought after and targeted. In May of 2012, FreightWatch reported the consequences that one theft ring experienced:

“The FBI headquarters in North Miami Dade is processing the arrests of the 11 cargo theft ring members who were responsible for the $76 million theft that occurred at a Connecticut warehouse in March 2010. The members are facing multiple charges including conspiracy to sell stolen goods, sales of stolen goods, concealing or storing stolen goods and conspiracy to sell and disperse stolen goods. The ring was also responsible for multiple truck hijackings of products including cigarettes, liquor and cell phones worth $20 million.” (FreightWatch)

This news creates a great sense of change within the industry. By proving the severity of these crimes and revealing the improvement in information and technology that is being used to improve the accuracy of catching these criminals, organization have more tools to better protect their products and consumers.

Another facet of warehouse vulnerability is the fact that usually machinery and other tools used in the facilities are available for thieves to use at their expense. Consider a warehouse
with a section specifically used to house pharmaceutical freight. Most of the time pharmaceutical freight remains on pallets in an effort to reduce handling time and maintain a high level of efficiency. These products are also usually maintained in a close proximity to each other in an effort to keep them safer and more accessible. There could be unintended and significant outcomes, however, if a warehouse is infiltrated. This was the case in the Eli Lily burglary where professionals were able to break in and use the machinery and steal in excess of $75 million dollars (wholesale cost) of both prescription and over-the-counter pharmaceuticals (Efrati and Loftus 2010). Evidence of these devastating thefts is rare, but due to the financial risk, these warehouses have to be under even tighter security requirements in an effort to protect the products being stored.

**Last Mile Couriers**

Another point in the supply chain that has been receiving more attention relative to security is the concept of last mile couriers. Couriers leave themselves exposed to extensive vulnerabilities when delivering products to a warehouse or distribution center. According to Chuck Forsaith, Director of Supply Chain Security for PurduePharma, the main element that leaves these last-mile couriers vulnerable is the drivers disconnect with the products. FreightWatch reported in August of 2011 an instance of this vulnerability when:

A pharmaceutical last mile courier (team driver) arrived at a scheduled [destination] in their route. The drivers were approached by two armed men and were forced to exit the vehicle, at which time the armed gunmen got in the van and drove away. One of the drivers contacted the FreightWatch control center, at which time the recovery protocol was put into place. FreightWatch contacted Detroit Police and provided the description and information on the stolen vehicle to include the address where the covert tracking device was reporting. Upon arriving at the location, the courier vehicle was found on fire. Product inside the vehicle was confirmed as the product stolen, with some containers opened and some others melted. No arrests were made.
In this situation, the couriers followed protocol, but in many circumstances that is not the case. Most of the time companies are hired to transport goods and the individual couriers have no repercussions if a load is stolen or materials are damaged. Current policies have been instated to place more emphasis on drivers to protect the supplier’s load of products. This is done through rankings of drivers that follow them through their career. These rankings are very impactful because when a driver leaves one company for another, he/she still has their individual ranking that distinguishes them from other drivers.

One of the main drivers of this scoring system is the 2010 Compliance, Safety and Accountability (CSA) Program implemented by the Department of Transportation, Federal Motor Carrier Administration. The program, which computes truck driver scorecards, helps secure cargo from theft and it protects unsafe driving practices that could harm the driver. While the intent of the CSA Program is to increase safety, it is adding to the driver shortage problem. Since there are more and more domestic shipments every year that rely heavily on the use of truck drivers, a huge industry disadvantage is the decreasing number of drivers available. Having scorecards keeps drivers accountable, but many times there is such a demand that supply cannot be met (Agarwal and Sharda 2012).

Repercussions

Many times when products disappear from the supply chain there is little that can be done to recover them. A big area of concern for the pharmaceutical industry is “What happens next?” after a theft has occurred. This was highlighted in Chuck Forsaith’s analysis of an individual going home and taking their nightly medications from their medicine cabinet. The threat of “What if?” is almost never in the minds of the consumers, especially when they look in their
medicine cabinet. The consumer expects to have each tablet, liquid gel or serum be exactly what
the manufacturer intended the product to be.

**Products Sold on the Black Market**

A vast quantity of the prescription drugs that have been removed from the supply chain
have been tracked, traced, or mysteriously ended up traded on the black market. One of the
hardest areas to control is this underground pseudo-establishment of buyers and traders working
outside of the state or government regulated establishments. Black markets facilitate individuals
selling controlled substances outside of the government control. They allow sellers to vary prices
of the pharmaceuticals, much like Product X, from double to twelve times the value of the “true”
prescription drug. This profit is on top of the value of the pharmaceuticals at the acquisition time,
when the drugs were obtained at virtually no cost. Some of the most sought after drugs on the
market are Pseudoephedrine and OxyContin. According to FreightWatch International:

“[O]ne pill of OxyContin costs the consumer $6 at the pharmacy, but runs anywhere from
$20 to $80 on the street. Oxycodone, same price behind the counter, but costs $12 to $40
per pill when sold illegally. Demand is driving this thriving market for criminals and drug
dealers. According to the DEA, this shift from illicit narcotics, such as marijuana and
cocaine, to prescription drugs is significant, citing an increase of 13% with regards to the
number of Americans abusing prescription drugs—some seven million.”

The Black Market and illegal trade are nothing new in the eyes of the global economy. As far
back as the Opium Wars between China and the United Kingdom, merchants have attempted to
trade substances prohibited by the local governments. Today, this dark trade has emerged
quietly, and attempts to remain unobtrusive in efforts to evade authorities are becoming more
lethal. Because of the high profit margin found by illegally selling these drugs, it remains a high
level of concern for many public officials.
One solution that a leading pharmaceutical industry manufacturer is working on is to make addictive substances less addictive and habit forming. By doing so, organizations are actively working to reduce the street price of pharmaceuticals by taking away strong effects of the drugs. This will hopefully help to ensure that dangerous drugs are strictly used for medicinal purposes.

**Sold to the Public**

Protection does not stop when Product X leaves the distribution center. Pharmaceutical companies are struggling with the potential for their products to reenter the legitimate market once they have disappeared from their supply chain. From an analogy presented by Chuck Forsaith: Imagine that you are looking in your medicine cabinet. Do you stop to ask: “Are my prescriptions safe to consume?” or “Is that bottle of pain killers contaminated?”

Regardless of how strenuously industry experts work to combat this threat, there are still numerous incidences of products that have been tampered with that ultimately make their way to the retail shelf. Evidence of this was through the arrest of Ernesto Simeon as presented in the scenario below.

A Cuban-American wanted for allegedly taking part in the largest heist of medicines in U.S. history was arrested in the Mexican Caribbean resort city of Cancun and handed over to U.S. authorities, officials said Thursday. Ernesto Simeon was arrested by state police Wednesday at the request of the FBI in Cancun, where he lived with his girlfriend, the Quintana Roo state Attorney General's Office said. Simeon, suspected of belonging to a gang that robbed businesses, was arrested during "Operation Southern Hospitality," which led to the arrests last week of other members of the gang in Miami, the AG's office said. The gang "is blamed for the biggest robbery of medicines in the history of the United States, which were sold at pharmacies and on the black market in Miami," the AG's office said. Simeon is accused of taking part in robberies of medicines, liquor, cigarettes and cell phones worth more than $100 million in recent years in Miami, the AG's office said. He is a subject "in an investigation of vehicles stolen from tourists" in the Florida city, the AG's office said. Simeon was handed over to U.S. authorities on Wednesday night and will be taken to Miami, where he faces trial, the AG's office said. (EFEOX NEWS)
Mr. Simeon was responsible for participating in one of the largest heists experienced in the United States. This robbery included the assistance of a gang who was responsible for hijacking pharmaceutical products from a variety of businesses and then selling those products in pharmacies. They did not focus their efforts purely on pharmaceuticals and there is no direct linkage to prove that the products they held in their possession had been directly linked to consumers being harmed. However, historical evidence has proven that not all consumers are as lucky.

In an article publicized by Johnson & Johnson, they have begun to take a proactive approach by announcing when products have been tampered with. This is in the event that anything happens while an existing recall is in effect. The proactive move creates a safety net for the company since it has a statement in place stating that it recognizes the issue and are working to correct it. Not only does this work to benefit the company, but it also shows that Johnson & Johnson is working to increase their responsiveness to hazardous conditions when serving their customers. By referencing companies who have experienced circumstances similar to this, like Johnson & Johnson, it is possible to avoid extensive troubles that could hinder the company’s image and tamper with customer loyalty.

**Company Backlash**

Johnson & Johnson is an interesting case study due to their very public recall of hundreds of stock keeping units (SKUs). A recall is, in essence, when a product is returned to a supplier to destroy a product or fix a defect. Although these products, or healthcare goods, are no longer in the possession of the host company, the company still needs to be very protective of this reverse supply chain.
Recalled products still factor into the reputation of the company. It has become critical to focus on the reverse logistics of the supply chain to ensure that the products are disposed of properly and investigated to determine the severity of the contamination. It is far too easy for an individual to see a truckload full of product and turn into a silent criminal, meaning that they would take these goods and sell them to a willing source at a lower cost than market value. Even though this seems relatively harmless, your supply chain might be responsible for pumping the hazardous product back into the markets, both legitimate and illegitimate.

**Legislation and Protection**

After many incidences of loss and pilferage, law enforcement and politicians have finally come together to create a solution to unrelenting theft of pharmaceuticals. Increased protection has now been passed. The Safe Doses Act is a bill signed by President Barack Obama on Saturday September 22, 2012. Entitled ‘Strengthening and Focusing Enforcement to Deter Organized Stealing and Enhance Safety Act,’ the purpose of this bill is:

‘…to combat large-scale theft of pre-retail medical cargo - lifesaving drugs that millions of American citizens rely on to cure illness - before they enter the stream of commerce. These thefts put patients at risk that is posed by stolen medical products that are then mishandled, stored improperly, and reintroduced into the supply chain. For example, in 2010, over $75 million of prescription drugs--including treatments for cancer, heart disease, and neurological disorders including depression, ADHD and schizophrenia were stolen from a warehouse in Connecticut. Arrests were not made until two years later. The legislation increases sentences for the theft, transportation and storage of medical product cargo, enhances penalties for those who knowingly obtain stolen medical products for resale, and increases sentences when harm occurs (such as injury or death) or trust is broken (such as when a defendant is employed by an organization in the supply chain). The bill also addresses the increasingly serious problem of the theft of controlled substances from pharmacies.’

The greatest attribute to the pharmaceutical protection industry is the diligent work of many different individuals who have followed and pursued these thieves for years and have worked painstakingly hard to ensure that consumers were protected from the effects of theft. One
such individual, Bloomberg’s Daniel Grushkin, has been researching and following domestic cargo theft activity and working with law enforcement to combat it. By studying thefts ranging to $10 million, and focusing primarily on the pharmaceutical industry, he has exposed trends such as gangs following loads hundreds of miles and waiting for the load to be left unattended. He specifically followed one case where “an arrest was made for possession of over $13 million in stolen products compiled from over 19 separate theft incidents in Palm Beach Country, but after 16 months in the criminal justice system, pled guilty to grand theft and received three years’ probation” (FreightWatch International, 2011).

**Conclusion**

The introductory statement still holds true: theft is not new, but many thefts can be avoided if companies begin to really understand the vulnerabilities in their supply chains. Companies, like FreightWatch, have worked hard to create general rules that could help companies maintain control over products at a higher risk of theft. Recent legislation has given law enforcement a stronger backbone to fight this organized crime, but with such a high stake in the game, it is unlikely that these thefts will dissipate overnight.

Because it is not the responsibility of the consumer to ensure the safety of the pharmaceuticals that they ingesting, companies cannot afford to ignore the risks. While there are many blind spots within the supply chain, protecting the flow of products needs to be the primary concern for pharmaceutical companies, not the lowest cost option. However, by maintaining a close relationship with all carriers and nodes within the supply chain network, the payoff will far surpass the costs that could be incurred by high impact thefts and tarnished reputations.
The information gathered and compiled for this thesis provides an in-depth review and assessment of global supply chain security issues. By examining the pharmaceutical supply chain in its multiple parts – beginning with raw materials and ending with the product in the consumer’s medicine cabinet – the research exposes the vast array of vulnerabilities that currently exist. Many companies, including pharmaceutical ones, have begun to actively institute policies and procedures to combat product theft – whether the product is being moved or is at rest. The research uncovered several actions that are recommended to reduce theft including:

- Thoroughly researching the carriers that are used for transportation;
- Installing modern and up-to-date video surveillance systems at airports and warehouses/DCs;
- Using brokers to facilitate the flow of a product or shipment through Customs;
- Instituting the 200-Mile rule;
- Utilizing team drivers where possible;
- Employing technology to safely disable stolen truck shipments;

The stakes are extremely high for the pharmaceutical industry as it relates to theft in the supply chain. While much progress has been made in reducing this type of risk, much more work is needed. The research presented in this thesis makes several contributions to the body of knowledge in cargo theft and loss. The actions listed above offer a path forward for companies that are seeking ways to improve the safety of their products as they flow through the supply chain. Many of the items can be implemented in a relatively short time frame. This research has developed a comprehensive assessment of the current state of supply chain risk emanating from
theft through the accumulation of information regarding the various risks and threats to products at specific points in the supply chain for the entire chain. As such it represents a contribution to the knowledge base as previously this information was primarily fragmented and available for only a particular part (or piece) of the supply chain.
Additional Exhibits

Exhibit 5: FreighWatch Rail Theft Reports

**Rail Theft Increasing in Mexico**  Rail theft has increased in Mexico over the past six months. Theft from containers has generated substantial losses to Ferrocarril Mexicano (Ferromex), Kansas City Southern de Mexico (KCSM) and their customers. According to Ferromex, theft from/of containers generated losses of $95 million pesos ($7 million USD) in 2011. … In Guanajuato state groups of underage gang members have been killed during confrontations with the Federal Police. Other hot spots for rail theft are the Port of Lazaro Cardenas and close to Ciudad Valles in San Luis Potosi. Rail theft has also been increasing over the past six months in the states of Tamaulipas and Sinaloa. Police recently captured 45 members of an organized gang that targeted in-transit rail containers of metals passing parallel to the San Luis Rio Colorado highway in Sonora state. This large gang, which was responsible for hundreds of metal thefts, made its profits by recycling the metals. The state of Guanajuato has been one of the most affected by rail theft. Most thefts in Guanajuato occur at night when trains stop or slow down in rural areas. …Police have been blamed for turning a blind eye to these thefts, and some believe the police receive a percentage of the sale price.

**Latest Incidents:**  Eight members of a gang specializing in stealing cargo from train containers were captured in Queretaro on November 3 after attempting to steal a load of construction materials from a Ferromex container in the municipality of El Marques, Queretaro. Three cargo thieves were captured on October 30 while attempting to steal sacks of grain from a Ferromex container in the municipality of El Santo, Jalisco. The criminals were transferring the sacks into their own trailer, parked next to the train, when police arrived. The authorities recovered the entire load of 30 large sacks of corn and 38 sacks of wheat. On October 18 a group of cargo thieves stole 30 plasma televisions from a train container in the municipality of Tezontepec de Aldama, Hidalgo state. Even though the train had an escort, authorities have been unable to determine exactly when the theft occurred. The TVs were valued at $150,000 pesos ($11,169 USD).
Sources


