LIBRARY OF CONGRESS

U.S. Intellectual Property and Counterfeit Goods—Landscape Review of Existing/Emerging Research

A Report Prepared by the
Federal Research Division, Library of Congress,
Under an Interagency Agreement with the
U.S. Patent and Trademark Office, U.S. Department of Commerce

February 2020

Researchers: Vega Bharadwaj
Marieke Brock
Bridey Heing
Ramon Miro
Noor Mukarram

72 Years of Research Services to the Federal Government
1948 – 2020

PREFACE

The U.S. Patent and Trademark Office (USPTO) leads the federal government's efforts to develop and strengthen domestic intellectual property policies, protections, and enforcement measures. It promotes the use of stronger and more effective intellectual property initiatives internationally as well. Among these projects, which include granting U.S. patents and registering U.S. trademarks, is a focus on understanding the scope of illicit trades of counterfeit goods, along with tracking the movements and impacts of such products.[1]

As of 2018, counterfeiting is the largest criminal enterprise in the world, with domestic and international sales of counterfeit and pirated goods totaling between an estimated $1.7 trillion and $4.5 trillion a year—a higher amount than either drugs or human trafficking.[2] Around 80 percent of these goods are produced in China, and 60 percent to 80 percent of those products are purchased by Americans.[3] Both statistics provide a general sense of the significant impacts such illicit trade has on the U.S. economy, U.S. business interests, and U.S. innovations.

In the summer of 2019, the USPTO partnered with the Federal Research Division (FRD) within the Library of Congress for research and analytical support examining various aspects of domestic and international counterfeit trade: the overall magnitude of the markets, the impacts on the U.S. economy, the role of the private sector in limiting exploitations, trends in trade via small parcels, risks to public health and safety, consumer attitudes toward such products, and the use of social media to facilitate the sale of counterfeit goods.

The analysis in this report is based on documents published and produced by governmental, intergovernmental, and nongovernmental agencies, as well as studies published in current periodicals and scholarly journals. Articles from reputable news outlets also were utilized for additional background information and context.

FRD's Commitment to Unbiased Research: FRD provides customized research and analytical services on domestic and international topics to agencies of the U.S. government, the District of Columbia, and authorized federal contractors on a cost-recovery basis. This report represents an independent analysis by FRD and the authors, who sought to adhere to accepted standards of scholarly objectivity. It should not be considered an expression of an official U.S. government position, policy, or decision.

As part of its commitment to unbiased research, FRD solicited the input of several outside reviewers. The project team thanks Timothy Hamilton, PhD; Justin Lloyd, PhD; and Carson Sievert, PhD, who were very generous with both their time and feedback.

Marieke Brock
Project Lead

HOW TO READ THIS REPORT

Although it is difficult to find exact figures for the scope and impact of counterfeit trade, this report highlights the data points that do exist in the relevant literature, providing a broad look at counterfeiting to assist policymakers in protecting American business, economic, and social interests. The FRD research team consulted resources with business, criminal, economic, financial, and legal perspectives to help facilitate the creation and implementation of highly effective and targeted policies.

This report includes the following sections:

Each entry for the seven focus areas follows the same basic layout: a brief topic summary, which includes key findings; a detailed analysis of the existing literature on that particular subject; and a table highlighting the most relevant studies FRD found during its searches.

Appendices for this report include:

Table of Contents

Table of Figures

Table of Tables

1. EXECUTIVE SUMMARY

Over the years, a variety of organizations have attempted to estimate the size of the international counterfeit market. Those figures range from a low of $200 billion in 2008 to a high of $509 billion in 2019.[4] Exact numbers are hard to find due to the illegal nature of counterfeiting, but the market encompasses goods from all industries and impacts economies around the world, although some industries and countries are more heavily represented than others in the research. For example, clothing, electronics, luxury goods, and pharmaceuticals are referenced or studied with greater frequency than other industries, such as food or tobacco. There is also a significant dearth of information on the domestic counterfeit market in the United States. Shifts in technology and services, such as the rise of e-commerce and the increasing ease of shipping small parcels around the world, are being used by counterfeiters to reach more consumers and evade detection.

The currently available research on counterfeiting is limited in scope, built on insufficient data, and largely international in focus. The lack of research on counterfeit goods has left key gaps in the knowledge base. Although the public health and safety risks posed by counterfeit products are well documented, there are no quantified data points that establish how common it is for these goods to result in injury. It is also unclear how consumer attitudes correlate to counterfeit purchases, or what tactics are most effective in marketing counterfeit goods. The economic impact of counterfeit trade to the United States in particular is obscured by a lack of data, while industries' ability to combat the sales of such products is unclear due to a lack of benchmarks and uniform reporting.

Despite this limited body of research, a wide range of organizations is publishing on the subject. Government statistics are the primary data source on counterfeiting, although U.S. Customs and Border Protection appears to be the main domestic agency collecting these figures. Estimates by the Organisation for Economic Co-operation and Development make up the foundation of further research, and the organization has published on numerous topics related to counterfeiting, including the scope of the market, trade routes, and specialized foci. In the United States, Michigan State University's Center for Anti-Counterfeiting and Product Protection is a dominant voice in this space, and scholars associated with the program have published reports on the state of the research, state-level analyses, and brand protection, among other topics.

One of the recurring themes across all research is the role of the internet in shaping counterfeit trade. With e-commerce sites such as Amazon and e-Bay, sellers can use the connectivity of the online marketplace to reach new consumers, modify their selling techniques, and obscure their transactions. These sellers, particularly online pharmacies, use a range of tools to lend themselves legitimacy—from purchased "likes" and fake comments to the use of copyrighted branding and domain names similar to those of the brands they are imitating. Studies have found that the

individuals who shop online are more likely to purchase counterfeit goods, although the research does not indicate whether those sales are made using deceptive or non-deceptive tactics.

Compounding these issues are the complex relationships that have developed between websites and services in the past 10 years; advertising on one platform might link to a shop on another, while a third service handles payment processing and shipping is handled by a fourth. The globalization of the online marketplace further amplifies the reach of counterfeit sellers.

Non-Deceptive Tactics refers to the fact that some sellers make it clear the products they are advertising are counterfeit. There is no intent to deceive the purchaser(s), many of whom buy these goods knowing they are not genuine products.

One of the most significant, and recurring, concerns related to studying counterfeit trade is the lack of comprehensive data and the problems raised by using what is available. Seizure data—which is voluntarily reported by some, but not all, countries—is the most commonly used source. However, the researchers agree that these figures, which document the numbers of counterfeit shipments intercepted by border authorities, provide at best a baseline of counterfeit activity, rather than a clear sense of the full scale of the problem. What's more, seizure data only capture goods transported across an international border, completely missing domestic counterfeit trade.

Other data sources also have issues. Self-reported figures, for instance, are unreliable; given the illicit nature of counterfeiting, many will not admit to intentionally or unintentionally purchasing such items. In other cases, it is not always clear that counterfeit goods are involved. Surveys have been conducted, particularly to gain insights to consumer attitudes, but the sample sizes are small or split across multiple countries. The results are often not country-specific, but rather aggregated across all of the countries polled. However, on topics like the public health and safety risks of counterfeit goods and the use of social media to facilitate counterfeit sales, anecdotal incidents are significant sources of information in the absence of concrete data.

Although there are significant research gaps related to all of the specific topics in this report, there is a high level of consensus that the counterfeit trade is growing and that it poses a variety of threats. There is also consensus around the shortcomings of the research body. Standardized methodologies, definitions, and quantification methods are necessary to establish effective baselines and estimates, while benchmarks are required to measure the impacts of efforts to combat counterfeit trade. Uniform data collection and reporting are also crucial for future research, as are greater efforts to study and quantify the domestic counterfeit market.

2. OVERALL MAGNITUDE OF COUNTERFEIT MARKETS

2.1. Topic Summary

The current research on counterfeit markets is fairly concentrated, with Michigan State University's Center for Anti-Counterfeiting and Product Protection (A-CAPP) leading the way in the United States and the Organisation for Economic Co-operation and Development (OECD)—often in partnership with the European Union Intellectual Property Office (EUIPO)—monitoring counterfeit trade abroad.* Although the information provided by these entities is useful, the literature relies repeatedly on the same imperfect data sources. Complicating the likelihood of new insights is a lack of universally accepted definitions for terms related to counterfeiting, enabling each research organization to categorize the markets as they see fit. Comparisons across the literature are therefore difficult to make. Still, the research offers insights to the size and composition of various supply chains, while also highlighting particular information gaps that can be addressed in future studies.

Overall, a review of the existing body of work on this topic yields the following key findings:

- **Limited Field of Study:** There is very little research being published in this space, with a small number of organizations and authors focused specifically on the topic of counterfeit markets.
- **Data Collection Issues:** Significant challenges exist in collecting data on the domestic and international counterfeit markets, making it difficult to calculate their sizes. Researchers often rely on seizure data (i.e., official government totals of confiscated products), which only provide baseline figures for counterfeit goods.
- **Mostly International Focus:** This reliance on seizure data from cross-border trade constrains the research to an international focus. Information regarding the production, sale, and consumption of counterfeit goods within the United States is scant. As a result, estimates of the domestic market rely on international models, which likely underestimate its overall size.
- **Counterfeit Markets are Growing:** Despite these data limitations, researchers agree that the domestic and international counterfeit markets are growing. The OECD estimates that between 2008 and 2013, the value of the international counterfeit market grew from $200 billion to $461 billion—a rate of 18 percent each year.[5] As for the domestic counterfeit market, the consulting firm Frontier Economics estimates that it could grow to total $959 billion by 2022.[6]

* A-CAPP is housed within the university's School of Criminal Justice and is one of the few academic institutions actively researching domestic counterfeit production and sales.

2.2. Detailed Analysis of the Literature

It is difficult to find exact figures for counterfeit goods, but the available estimates suggest that the international market is currently worth between $400 billion and $600 billion—making it larger than the 2018 gross domestic product of over 150 countries, and around 2 percent of all global trade.[7] According to the available research, China is the largest producer of counterfeit goods sold around the world, with Hong Kong coming in second. Together, these two jurisdictions accounted for 80 percent of the counterfeit goods seized between 2011 and 2013.[8] Although the data points on the counterfeit market within the United States are thin, the literature suggests that it could be worth around twice the value of international counterfeit trade.[9]

2.2.1. Limited Field of Study

Efforts to regulate and slow the growth of counterfeit trade have a long history, yet attempts to quantify the full scale of the domestic and international markets are a more recent phenomenon. The U.S. International Trade Commission's 1988 report, *Foreign Protection of Intellectual Property Rights and the Effects on U.S. Industry and Trade*, for example, is widely considered the first study to quantify the impact of intellectual property rights infringements on the U.S. economy.[10]

Ten years later, in 1998, the OECD conducted a study on the international impact of counterfeiting, following that with a substantial, multi-phase research project on the subject beginning in 2005.* Phase I of that project resulted in the publication of the 2008 report, *The Economic Impacts of Counterfeiting and Piracy*, which Frontier Economics cites in their 2016 report of the same name as "the first attempt to systematically estimate the incidence of counterfeiting . . . in international trade."[11]

However, three decades after the release of the U.S. International Trade Commission's report, studies of the overall magnitude of the domestic and international counterfeit markets are still limited.[12] The research issues highlighted by the early reports, such as a lack of data and the use of unclear methodologies, remain at the forefront of discussions about the markets' size. In its 1988 report, the commission notes that the available data do not necessarily correspond to the size of the full market: "The data, therefore, represent estimates from a percentage of an unknown universe; the losses suffered by the U.S. industry as a whole may well be larger."[13] Likewise, the White House's FY2017–19 *Joint Strategic Plan on Intellectual Property Enforcement* uses an iceberg metaphor to describe the current understandings of the markets' scope: While researchers have access to data, it is unclear what portion of the complete picture those data points represent.[14]

* For more information about this project and its various phases, see "OECD Project on Counterfeiting and Piracy," accessed August 19, 2019, https://www.oecd.org/sti/ind/oecdprojectoncounterfeitingandpiracy.htm.

2.2.2. Data Collection Issues

The predominance of OECD research and the over-reliance on several main texts in this field of study cannot be overstated. For instance, all nine non-OECD reports reviewed for this section referenced an OECD estimate; six of those nine articles then used the figures as the basis of further modeling or study. This ratio speaks to the lack of available data (see textbox). Further, while these estimates provide a systematic way of quantifying the international counterfeit market, there are some notable exclusions, including online sales and items that do not cross international borders.

The OECD's General Trade-Related Index of Counterfeiting—which estimates the scale of production by combining indices measuring counterfeit exports and how likely some product categories are to be counterfeited—placed the value of the global counterfeit market at $461 billion in 2013.[21] This figure has been used as the baseline estimate in subsequent reports from other organizations, including the U.S. Chamber of Commerce's *Measuring the Magnitude of Global Counterfeiting* (written by its Global Intellectual Property Center) and Frontier Economics' *The Economic Impact of Counterfeiting and Piracy*.[22] Notably, the OECD published a new estimate of $509 billion in 2019.[23]

Calculating the Size of Counterfeit Markets

The use of seizure data as a nearly exclusive indicator of counterfeit markets speaks to the dearth of figures available. Though seizure data are some of the only reliable means of examining counterfeit sales, they do not necessarily correspond to the markets' overall volume.[15] In fact, seizures can have nothing to do with the counterfeit market. For example, special operations can yield higher seizures in one industry one year and another industry the next. Additionally, not all countries publish seizure data, and of those that do, "only a small proportion . . . publish reliable, consistent, and detailed seizure statistics."[16]

However, identifying alternative means of measuring the domestic and international counterfeit markets is hard. Researchers indicate that techniques such as interviewing have not been helpful in the past due to the challenges of communicating with counterfeiters. The authors of "Assessing the Developing Knowledge-Base of Product Counterfeiting," for instance, note that the illicit nature of counterfeiting makes it difficult to gather first-hand information.[17] Similarly, the Better Business Bureau notes that self-reporting is limited as some consumers knowingly purchase counterfeit products and industry-leading companies are often reluctant to publicize any counterfeiting out of concern for the value of their own legitimate products.[18]

Using accident reports (i.e., reports on incidents causing physical harm or injury) is another imperfect technique, as it is not always clear that counterfeit goods are involved.[19] Criminal records are likewise limited in value. Statutes vary by state, and counterfeiting is often not the crime for which someone is arrested or charged.[20] For example, s/he could be arrested on a non-counterfeit-related charge, such as money laundering, obscuring their connection to the domestic market.

For its report, Frontier Economics also used the United Nations' gross domestic product data and Comtrade database to gauge the propensity of components to be counterfeit. It calculated that between 2008 and 2013, the international counterfeit market had grown 18 percent each year, an estimate most researchers accept. The consulting firm also determined that "the total scale of domestic production and consumption of counterfeit and pirated products in 2013 was $249–$456 billion." Based on these findings, it forecast that by 2022, the range could be $524 billion to $959 billion.[24]

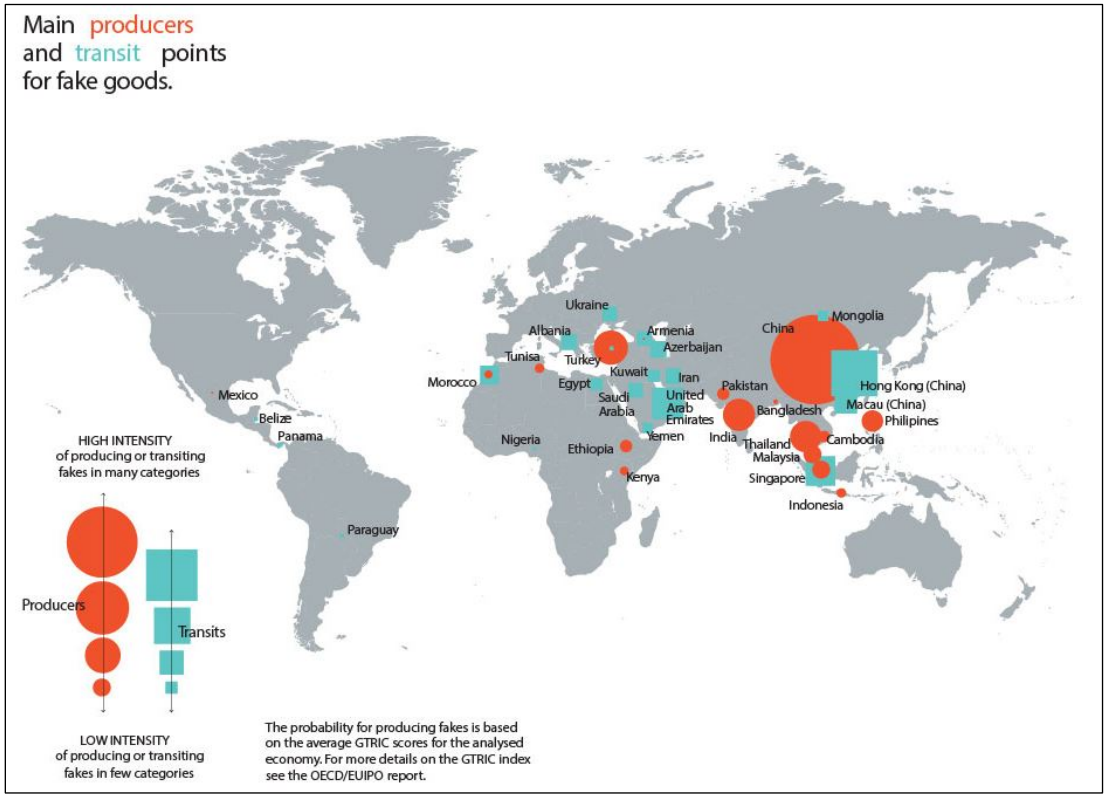
Similarly, the RAND Corporation's European office created its own method to quantify the international counterfeit market in 2012, using a supply-side model that compares forecasted

sales to actual sales. However, it found that the model did not produce estimates that were in line with other, more widely accepted totals for a given year.[25] This model is absent from the larger research pool and RAND does not appear to be working on an update at this time.

2.2.3. Mostly International Focus

The current literature on the overall magnitude of counterfeit markets is almost exclusively international in nature. Researchers know more about the trade routes along which counterfeit goods flow than the volumes that pass along them or the production and sale of such goods within borders. As a result, some facets of counterfeit trade have been studied extensively. Free Trade Zones (FTZs) and their role in counterfeit trade routes, for example, is a well-known and well-documented area of research. For instance, the OECD notes that the number of FTZs has grown rapidly, from 79 zones in 1975 to 3,500 in 2006.[26] It has also done important work mapping the routes used for counterfeit trade, documenting which countries serve as transit points for particular goods (see fig. 1) and identifying the key ways in which counterfeiters use these routes to conceal the regions of origin, such as sending disassembled goods in multiple shipments or creating false papers. Certain products, such as electronics, electrical equipment, and foodstuff, have particular transportation routes based on their final destinations.[27]

Figure 1. Main Producers and Transit Points for Counterfeit Goods, 2013

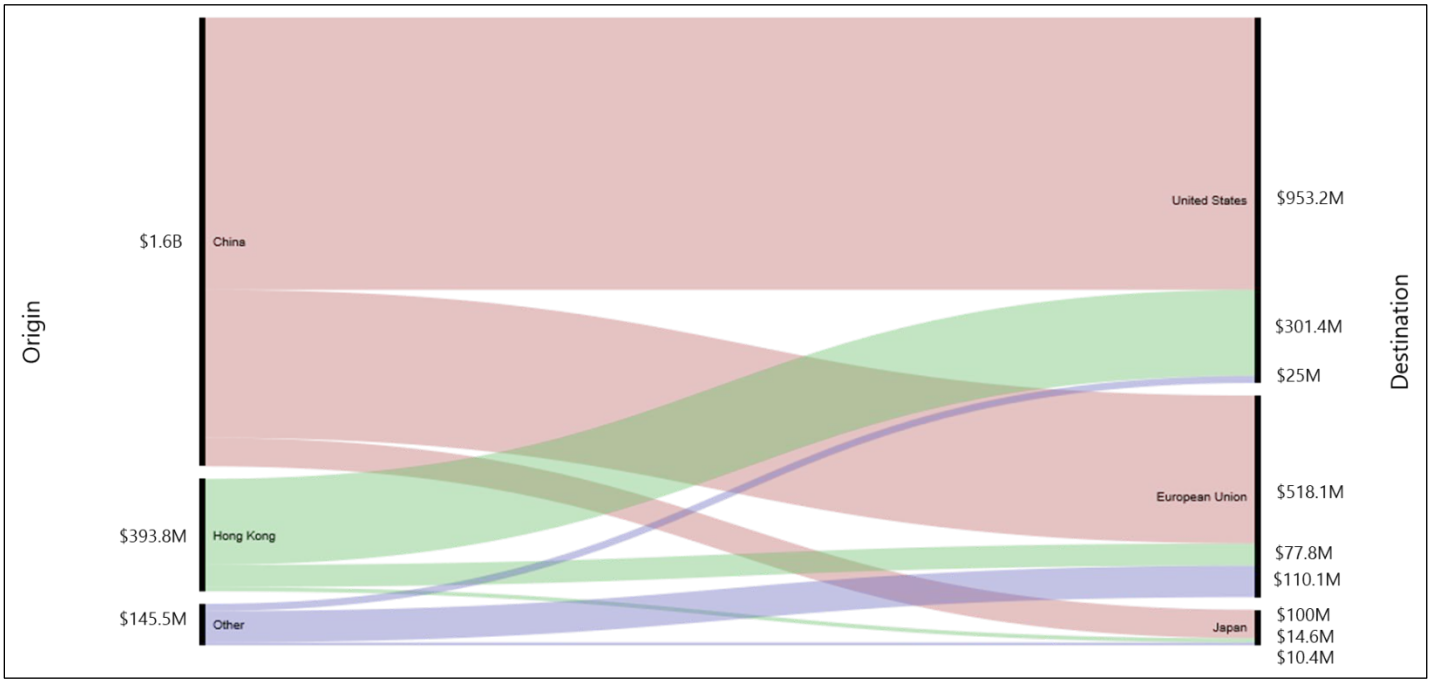


Source: OECD, *Mapping the Real Routes of Trade in Fake Goods: Highlights Brochure*, 2017.

When it comes to counterfeit goods produced or sold in the United States, the research is scant. Only one study—written by the U.S. Chamber of Commerce's Global Intellectual Property Center—attempted to model the United States' share of global counterfeiting. According to this model, which looked at 38 countries, the United States could be responsible for producing counterfeit goods worth around $872 million, or about 0.2 percent of the international market.[28,*]

The United States is often included in studies due to the volume of counterfeit goods brought into the country, as well as the number of counterfeiters who target products with U.S. copyrights and trademarks. Leading the world in intellectual property development, the United States is also the primary victim of intellectual property theft, with around 24 percent of all such violations affecting rights holders.[29] As shown in figure 2, from 2010 to 2014, the United States was the destination for around $1.3 billion of counterfeit goods, $576 million more than the European Union and $1.15 billion more than Japan.[30]

Figure 2. Top Three Producers/Importers of Counterfeit Goods, 2010–14



Source: Based on data from U.S. Chamber of Commerce, Global Intellectual Property Center, *Measuring the Magnitude of Global Counterfeiting*, 2016.

[*] The other 37 countries sampled were Algeria, Argentina, Australia, Brazil, Brunei, Canada, Chile, China, Colombia, Ecuador, France, Germany, India, Indonesia, Israel, Italy, Japan, Malaysia, Mexico, New Zealand, Nigeria, Peru, Poland, Russia, Singapore, South Africa, South Korea, Sweden, Switzerland, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom, Venezuela, and Vietnam.

What happens to these products once they enter the United States, however, remains unclear in most cases, and counterfeit goods produced and sold domestically are virtually invisible. In fact, of the relevant research, only one report focuses on counterfeiting within the United States—"Product Counterfeiting at the State Level." In this report, the authors focus on Michigan and cite the automobile industry as a unique factor impacting the state's counterfeit market.[31]

Although there do not appear to be similar studies for other states, the existence of this report suggests that domestic counterfeiting data could be gathered from various investigative records. In particular, the authors rely on arrest, court, and other police files to study Michigan's counterfeit market. Yet they acknowledge the challenges this posed: "We simply could not analyze certain variables because the information was not available . . . Therefore, we consider this study 'stage-setting research.'"[32]

2.3. Most Relevant Studies

Reports were deemed relevant for this section if their findings focused on the overall scope of the domestic and international counterfeit markets, as well as the general volume of counterfeit goods being produced, sold, and consumed; filled a certain research gap; or provided insights into what those gaps might mean for the field. Studies with a particular geographic or industry focus were discarded. Table 1 highlights the most relevant of these studies, as well as their data sources and key findings.

Table 1. Most Relevant Studies: Overall Magnitude of Counterfeit Markets

Title (Year)	Data Source(s)	Key Finding(s)
"Assessing the Developing Knowledge-Base of Product Counterfeiting" (2017)	Lit. Review	Studies on counterfeit markets are limited by unclear methodologies, incomplete data, and a lack of agreed-upon definitions.
The Economic Impacts of Counterfeiting and Piracy (2017)	OECD Data	Models based on OECD data estimate that the domestic and int'l counterfeit markets will grow to $524B–$959B and $991B, respectively, by 2022.
Fakes are Not Fashionable (2019)	OECD Data, Surveys, and Self-Reports	Online sales of counterfeit goods are common, being addressed in a variety of ways, and impacting large numbers of people.
Mapping the Real Routes of Trade in Fake Goods (2017)	Seizure Data	The types of counterfeit goods being sold and shipped seem dependent on their destination(s), while transit hubs can be used to hide their regions of origin.
Measuring IPR Infringements in the Internal Market (2012)	Sales Figures and Forecasts	Sales numbers and forecasts can be used to estimate the economic impacts of counterfeiting, but it is hard to say which portion of lost sales are related specifically to intellectual property rights infringements.
Measuring the Magnitude of Global Counterfeiting (2016)	Seizure Data	Although research on the domestic counterfeit market is scant, estimates show that the U.S. could be responsible for producing around $872M in counterfeit goods.
"'Measuring the Unmeasurable'" (2016)	Lit. Review	The current means of measuring counterfeit markets are insufficient, but novel approaches will similarly challenge researchers as rapid changes in the marketplace make developing an effective process particularly difficult.

Title (Year)	Data Source(s)	Key Finding(s)
"A Review of the Economic Impact of Counterfeiting and Piracy Methodologies" (2012)	Lit. Review	The research in this field lacks rigor and there is no reliable quantitative process to study the size of the international counterfeit market or its economic impact.
Supporting Innovation, Creativity, and Enterprise (2016)	Lit. Review	Various practices, such as increased diplomacy and public outreach efforts, can be used to mitigate the threats posed by counterfeit goods and discourage their sale.
Trade in Counterfeit and Pirated Goods (2016)	Seizure Data, Int. w/ Customs Officers	Analyzing several quantitative estimates of the size of the international counterfeit market suggests it was around 2.5% of global trade, or around $461B, in 2013.
Trends in Trade in Counterfeit and Pirated Goods (2019)	Seizure Data, Int. w/ Customs Officers	Estimates now show that the international counterfeit market has grown to around 3.3% of global trade, or around $509B.

3. IMPACTS OF COUNTERFEIT GOODS ON THE U.S. ECONOMY

3.1. Topic Summary

Despite significant data limitations, experts agree that the domestic and international counterfeit markets have adverse effects on the U.S. government and U.S. industry. Rudimentary estimates suggest that $143 billion of counterfeit or pirated goods are sold domestically and abroad each year.[33,*] The available research has yet to quantify the toll that illicit trade takes on the economy but some evidence reveals how direct and indirect effects, such as lost tax revenue, further the negative impacts of these goods.

The impacts, which range from lost sales revenue to increased business costs, are widespread and varied. However, fully understanding the consequences of counterfeit trade on the U.S. economy is difficult, if not impossible.

The current research on this topic highlights several key areas of interest:

- **Data Collection Issues:** Estimates of the economic impacts of counterfeiting do exist for the United States, but these figures are based on limited, non-U.S.-specific data and are not comprehensive.
- **Negative Effects on Industry:** Counterfeit products pose a range of threats to legitimate businesses in the United States. Research has found that counterfeiting and piracy costs U.S. businesses more than $200 billion a year and leads to the loss of more than 750,000 jobs.[34] Estimates suggest that sales of counterfeit and pirated goods abroad displace sales in the United States, costing the U.S. economy around $29 billion a year.[35]

[*] *Author's Note*: This figure varies dramatically from the estimates listed in the previous section as the source did not disaggregate counterfeit and pirated goods. It is also unclear if this figure refers only to products by U.S. rights holders.

- **Negative Effects on Government:** Understudied in the research, counterfeit trade does have some demonstrable impacts on federal agencies and state governments, particularly higher operational costs and lower tax revenues. Industry reporting in 2016, for example, suggests that lost revenues from sales taxes (as a result of counterfeit goods consumption) ranged from $24 billion to $44 billion a year in the United States.[36]

3.2. Detailed Analysis of the Literature

Current estimates of the impacts of counterfeit goods on the U.S. economy are derived largely from work conducted by the OECD and EUIPO, as well as seizure statistics from U.S. Customs and Border Protection (CBP) and U.S. Immigration and Customs Enforcement (ICE). Other pieces of information have been gleaned from a variety of reports and academic articles, providing a better sense of the impacts on particular brands and industries.

3.2.1. Data Collection Issues

Most statistics for counterfeit goods entering the United States are based on seizure reports from CBP. However, these figures only capture a small portion of the products entering the country at various border crossings. They do not include counterfeit goods shipped within the United States itself or sold to foreign markets. Other numbers are calculated using proxy data, resulting in estimates that vary wildly.

For example, according to the U.S. Government Accountability Office (GAO), CBP seized shipments of counterfeit goods worth an estimated $1.4 billion in fiscal year (FY) 2016.[37,*] Yet according to the bipartisan Commission on the Theft of American Intellectual Property (IP Commission)—which used OECD and EUIPO data—the United States imported between $58 billion and $118 billion of counterfeit and pirated goods in 2015. This massive discrepancy is due in part to the fact that the commission did not disaggregate counterfeit goods, instead combining them with pirated products and other intellectual property thefts.[38] Still, the dramatic difference highlights the difficulties in accurately measuring the economic effects of counterfeit trade.

3.2.2. Negative Effects on Industry

The direct effects of counterfeit trade on U.S. industry include losses in brand values and sales revenues, as well as increased business costs. These impacts can multiply quickly considering the fact that intellectual

Industry Spotlight: Semiconductors

The Semiconductor Industry Association estimates that the financial loss from semiconductor counterfeiting is $7.5 billion a year. Additionally, this counterfeiting leads to the loss of 11,000 jobs in the industry.[39]

[*] CBP uses the Manufacturer Suggested Retail Price to estimate the value of seized counterfeit goods (GAO, *Intellectual Property*, 2).

property-intense industries account for 56 million jobs in the United States, around 35 percent of the total labor force.[40] Researchers have noted that counterfeiting and piracy cost U.S. businesses more than $200 billion a year and lead to the loss of more than 750,000 jobs.[41]

3.2.2.1. Lost Brand Values

Brand values are key assets for certain rights holders. A 2003 World Economic Forum survey, for example, found that chief executives believed brand reputation accounted for more than 40 percent of a company's market capitalization. A 2009 study assessing brand value found that managing risk is one of five critical criteria with "intangibles." Because of this, corporate brand managers who were traditionally charged with carrying out marketing directives are now also responsible for assessing and managing risks to a brand's reputation.[42]

Although limited in volume, industry research has found that a firm's perceived brand value is negatively affected when counterfeits of its product(s) become plentiful. Not only are brands at risk of losing distribution sellers if their affiliates see reductions in demand because of competition from these fakes, but the availability of cheaper "alternatives" exerts pressure on their legitimate pricing structures. Additionally, an increase in inauthentic brand experiences can cause customer loyalty to decline.[43]

3.2.2.2. Lost Sales Revenues

Industry Spotlight: Pharmaceuticals

In 2011, the Premier Healthcare Alliance estimated that the pharmaceutical industry loses approximately $75 billion in revenues a year to the sale of counterfeit drugs.[44]

As companies try to deal with the impacts of counterfeiting, they often see losses in their sales revenues. Yet the values of illicit sales do not translate directly into sales lost to U.S. firms on a dollar-for-dollar basis. According to the IP Commission, the true cost in legitimate sales is unknowable, but certain to represent a significant proportion of counterfeit purchases. Current estimates suggest that at least 20 percent of counterfeit and pirated goods sold abroad displace sales in the United States. Based on the rudimentary estimate of $143 billion sold in such goods, these sales cost the U.S. economy around $29 billion a year.[45]

3.2.2.3. Added Business Costs

Industry reporting suggests there are two ways in which counterfeit trade may increase the costs of doing business. First, customer service and product warranty costs can climb following quality-related complaints, which can result from inadvertent purchases of counterfeit goods. Counterfeit sellers can also increase marketing costs by manipulating advertising measures and search engine optimization. Such tactics make online marketing more expensive and less effective for legitimate brands.[46] Additionally, firms need to invest in anti-counterfeiting programs, which can be costly. Still, major research-based pharmaceutical companies have invested heavily in such programs.[47]

3.2.2.4. Reduced Ability to Innovate/Compete

Indirect costs to the U.S. economy (e.g., a devaluation of trademarks and loss of competitiveness) are more difficult to measure, but the IP Commission concludes that the challenges of measuring such costs render them no less substantial. According to the commission, intellectual property theft is much easier to carry out with the help of the internet and, as a result, related protection costs have risen dramatically. Also, U.S. firms become less competitive globally when they are "discouraged from investing the substantial capital required to innovate or effort required . . . to be the first movers to market."[48]

3.2.3. Negative Effects on Government

Research on the impacts of counterfeit trade to the U.S. government is far more limited. There have been few attempts to quantify these consequences, and the most significant takeaways from the available sources—such as the increased operational costs that result from the increased quality of counterfeit goods—have not been deeply explored. While inferences can be made from industry or state-level reports, there is little comprehensive insight on the ways in which the domestic and international counterfeit markets effect government operations.

3.2.3.1. Added Enforcement Costs

Although the growth of the counterfeit markets has led to increased protection efforts, little is known about the actual costs of enforcing intellectual property regulations. However, there are some insights on interdictions, seizures, investigations, and prosecutions in the research. For example, CBP officers report that the improved quality of counterfeits has led to increased inspection and processing times. Additionally, the higher quality requires them to coordinate and work with private industry to test suspicious products.[49]

As for ICE, the agency arrested 458 individuals, obtained 328 indictments, and received 276 convictions related to intellectual property crimes in FY2016. Like the IP Commission's numbers, these data are not disaggregated so it is unclear how many involved counterfeiting versus piracy. ICE's Operation Chain Reaction does focus on counterfeit goods and during the course of the operation in FY2016, it started 19 criminal investigations and conducted 15 criminal arrests, which secured 14 indictments and 9 convictions. This resulted in over 100 seizures of counterfeit goods that were worth a total of $3.5 million.[50]

3.2.3.2. Lost Tax Revenues

A negative impact of counterfeiting for governments that is connected to the consequences for industry is lost tax revenues. In the early 2000s, for instance, comptrollers in Los Angeles and New York City estimated that the cities were losing, respectively, around $500 million and $1 billion

annually.[51] The consumption of counterfeit goods also impacts the revenues from sales taxes. Industry reporting in 2016 found that these losses ranged from $24 billion to $44 billion a year in the United States.[52]

3.3. Most Relevant Studies

As this section focused on the impacts of counterfeit trade on the U.S. economy, reports were deemed relevant if they highlighted the overall consequences of such trade, or if they contained insights on certain direct or indirect impacts into particular aspects of the economy, such as lost sales revenue or increased business costs. Table 2 describes the most relevant studies that discuss the overall economic impacts of counterfeiting, as well as their data sources and key findings.

Table 2. Most Relevant Studies: Impacts on the U.S. Economy

Title (Year)	Data Source(s)	Key Finding(s)
Intellectual Property (2018)	CBP and ICE Data	E-commerce has prompted a shift in counterfeit trade as consumers increasingly purchase goods online and counterfeiters sell a wider variety of items alongside authentic products.
The IP Commission Report (2013)	CBP and OECD Data	Intellectual property theft results in annual losses of hundreds of billions of dollars and millions of jobs in the U.S. It also creates a drag on economic growth and diminishes incentives to pursue innovation.
"Synchronizing Anti-Counterfeiting Efforts" (2017)	Government and Industry Data	Reviews technologies for the pharmaceutical industry and provides insight into the economic impact and costs that the industry incurs addressing counterfeiting.

4. ROLE OF THE PRIVATE SECTOR IN LIMITING EXPLOITATIONS

4.1. Topic Summary

The private sector's response to counterfeiting involves minimizing the criminal exploitation of brands, supply chains, and commercial platforms. Voluntary initiatives include a range of activities, from best practices and strategies for both rights holders and intermediaries (e.g., advertisers and payment processors), to specific technology solutions for avoiding and detecting counterfeit products. However, the research in each of these areas is industry-specific and cannot be broadly applied. Moreover, few metrics and benchmarks exist to indicate how much of an impact these initiatives have.

A review of the existing literature on this topic reveals three key themes:

- **Threats:** Vulnerabilities in physical supply chains can make it easier for counterfeit items to enter the marketplace. Online, e-commerce platforms and related tools can be exploited by counterfeiters to reach more consumers and carry out sales transactions. For instance, in 2015, researchers found that in just two months, counterfeit goods worth over $2 billion were sold online in the United States.[53]

- **Actions:** Although few data points exist on the efficacy of industry initiatives to combat counterfeiting, researchers have documented a range of ways (e.g., increased monitoring and notice-and-takedown procedures) to counter the sales of such products. Industry research suggests, for example, that rights holders can make great progress monitoring the top 10 e-commerce sites, which account for 80 percent of all web traffic.[54]
- **Impacts:** Anecdotal evidence suggests that these industry initiatives can act as safeguards against counterfeiting, although the results cannot be effectively generalized. A 2013 report notes that 2,100 individual merchant accounts were terminated on 7,500 websites accused of selling counterfeit goods through 26,000 different payment channels.[55,*] However, such terminations cannot, on their own, limit the overall scope of counterfeiting.

4.2. Detailed Analysis of the Literature

Products pass through a number of steps before reaching a market where consumers can search for, purchase, and receive them. Each point in the process, whether it takes place online or offline, has weaknesses that make the products vulnerable to counterfeiters. Although industry research showcases these vulnerabilities and explores potential antidotes, there are few, if any, concrete measurements to demonstrate the effectiveness of particular initiatives; the academic research is largely theoretical and experimental.

4.2.1. Threats

Both physical supply chains and the online marketplace contain weaknesses that can be exploited by counterfeiters. These exploitations may be internal or external, and can occur at any stage of the process. Compounding these threats is the fact that as e-commerce has grown, so too have counterfeiters' abilities to manipulate the platforms to ensure they reach an increasing number of customers.

4.2.1.1. Physical Supply Chains

Vulnerabilities in physical supply chains include the lack of exclusive agreements with packagers and suppliers, the diversion of supplies and materials, the intentional mixing of legitimate goods and counterfeit products, and the unknowing purchase of such counterfeits during distribution. Shipping is of particular concern, whether it involves supplies or finished products, as there exists the potential for items to be removed at various transfer points. Threats to product legitimacy, however, begin in the design stage. One common intrusion at this point is for employees to release proprietary designs/materials to unauthorized manufacturers, enabling them to produce counterfeit versions.[56]

* "Payment channel" refers to any method a customer or merchant may use to make/accept a payment (Bridy, "Internet Payment Blockades," 1552).

Once a prototype is set and ready for production, the suppliers ship the necessary components to the manufacturers. These third-party factories and authorized production facilities might also produce unauthorized originals. Alternatively, they can create more items than needed, presenting an opportunity for unauthorized goods/parts to enter the market.[57] In the electronics industry, for example, integrated circuits are vulnerable to cloning by counterfeiters, leading to substandard products entering the supply chain. Counterfeiters can do this by illegally obtaining the intellectual property or through reverse engineering. Regardless of method, these activities eventually affect the original creators, who can suffer losses in revenue and reputation.[58]

After the product is manufactured, it is packaged and sent to a distributor. The distributor then ships the items to retailers, where it becomes available to consumers. Still, any time products or parts are transported between destinations, they are at risk of being diverted from the legitimate supply chain and repackaged or reused in unauthorized ways.[59]

4.2.1.2. Online Marketplace

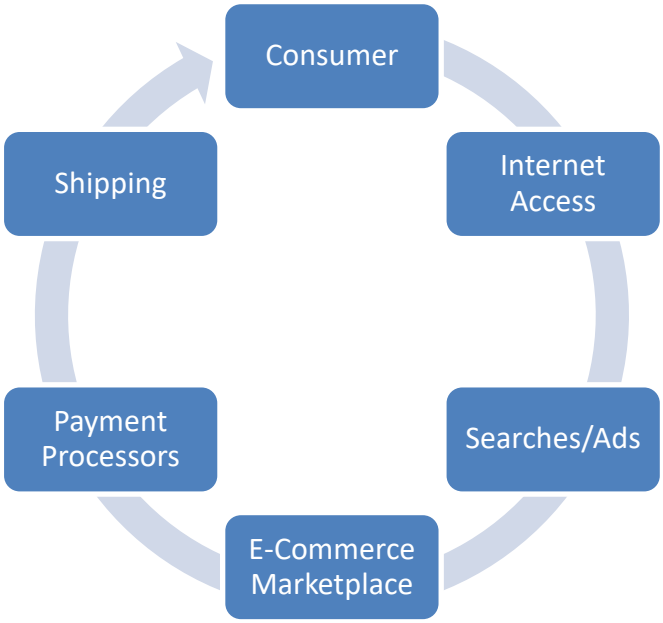
Although e-commerce is extremely convenient, the remote nature of the platforms makes it easier for counterfeiters to blur the lines between legitimate and unauthorized products. The websites, social media apps, and services making up the online marketplace may contain third-party sellers alongside rights holders. Many of these sellers are legitimate entities, but their presence provides counterfeiters with more opportunities to distribute their products. For example, sellers are largely autonomous on platforms such as Amazon and eBay, operating with limited oversight until a complaint is filed. On eBay specifically, transactions begin the moment an item is posted, leaving no time for a review of the postings themselves. Similarly, some mobile app stores do not require pre-approvals for content, enabling vendors to include options that facilitate counterfeit trade.[60]

In fact, each part of the online marketplace offers a chance for counterfeiters to exploit it. For instance, internet access and domain hosting providers are the backbone of this market, providing domain names, storage space, and other related services. Yet these options, intended for legitimate users, can also help counterfeiters distribute and sell their illicit goods. Counterfeiters even use these services to evade detection, regularly switching between providers or changing their domain names.[61]

As in the physical world, online shoppers will encounter advertisements (see fig. 3). Counterfeiters can exploit these services as well by manipulating the overall ecosystem, which not only harms consumers, content creators, and distributors, but also advertisers by associating their brands with illicit activity.[62] Counterfeiters buy and place ads on legitimate websites through advertising networks like Google DoubleClick, which help drive traffic to their sites. For example, a counterfeit shoemaker can falsely advertise a name-brand shoe on recognized retail sites, diverting traffic from legitimate sales to an illicit, and possibly cheaper, version.

Additionally, counterfeiters can benefit from the advanced computer algorithms these networks use to place advertisements on different websites. This method is automated to efficiently reach various target audiences. However, the algorithms cannot differentiate between legitimate goods or sellers and counterfeits.[63] The search engines directing the web traffic are also at risk of promoting counterfeit websites as they use the same indexing tools for both legitimate platforms and those linking to counterfeit goods. Search engines generate a significant portion of their income from advertising, making them even more vulnerable to advertisements for counterfeit goods.[64]

Figure 3. Online Purchasing Lifecycle



Once a consumer finds an item to purchase, they will pay for it through an online processor—much as they would at a physical point of sale—by providing some form of credit information. As with the other aspects of the online marketplace, counterfeiters can exploit the weaknesses in the payment processing system to their advantage. These weaknesses include a lack of close oversight that enables a circumvention of security measures, "open loop" payment networks in which third-party banks take the action against infringing merchants, and disciplinary action that targets an individual, allowing the primary site to continue operating and selling counterfeit goods.[65] These intermediaries, which include credit card companies and money-transfer services like PayPal, process billions of dollars of counterfeit goods each year. In the United States alone, for example, counterfeit goods worth over $2 billion were reportedly sold online in November and December 2012.[66]

4.2.2. Actions

E-commerce platforms currently deploy a variety of tools to help copyright owners respond to counterfeit trade, including sophisticated algorithms that are followed by specific actions, policy enforcement, and trust marks or badges that signal authenticity.[67] However, it is unclear how effective these tools actually are. While there are specific best practices these platforms can follow, the research also recommends increasing their monitoring activities and implementing stronger notice-and-takedown strategies.

4.2.2.1. Best Practices

A few industry organizations have published recommendations to help online service providers curtail counterfeit activity. These suggestions include greater collaboration with rights holders when dealing with counterfeit listings. The International Trademark Association, a dominant voice in this space, has encouraged providers to, first and foremost, establish formal policies related to counterfeit goods and sellers. Search engines in particular should enact processes that streamline reporting and be more proactive in de-listing links and escalating enforcement actions. This could include reporting to local, state, or federal law enforcement; the National Intellectual Property Rights Coordination Center; or the Internet Corporation for Assigned Names and Numbers.[68]

Groups representing members of the advertising industry have also been working to develop best practices over the past several years. For example, previous guidelines by the Association of National Advertisers and Interactive Advertising Bureau encouraged advertising platforms to establish clear reporting processes, update contract language concerning counterfeit sites, and increase transparency.[69] Similarly, in 2015, the Trustworthy Accountability Group (TAG), "a cross-industry accountability program," published guidelines for so-called digital advertising assurance providers (DAAPs).[70] These guidelines help ad agencies, ad networks, trading platforms, and other members of online ecosystem avoid "ad risk entities"—namely, websites with a discernible risk of being associated with counterfeit goods. After these guidelines were published, the advertising community worked with others in online media to create a voluntary validation program for DAAPs. TAG then published *Core Criteria for Effective Digital Advertising Assurance* to establish a framework encapsulating the validation criteria and process.[71]

The payment processing industry has also published best practices for dealing with counterfeiting disputes. For example, it adopted two sets of guidelines in May and July 2011, following a series of meetings with the Office of the U.S. Intellectual Property Enforcement Coordinator; major credit card companies and money-transfer services were among the other participants. Together the attendees created the Payment Processor Initiative, which launched in January 2012 under the trademark RogueBlock. The program now includes over 30 unnamed rights holders; eight payment processors, including American Express, Discover, MasterCard, Visa, and PayPal; and law enforcement.[72] The participating rights holders represent several industries, including apparel, luxury goods, electronics, and pharmaceuticals.[73]

RogueBlock is designed to help rights holders notify payment processors of counterfeit websites so the systems can revoke any online purchases.[74] Through the secure online portal, rights holders submit complaints using a standardized form. RogueBlock requires four elements for a complaint to be actionable:

- A description of the infringement and website,
- Evidence that infringing products are available for purchase,
- A copy of a notice from the rights holder, and
- Evidence that the requestor owns the rights in question.[75]

Although RogueBlock is considered a successful effort, counterfeiters continue to use ever more sophisticated measures to detect and evade enforcement (e.g., blocking certain web addresses from accessing their location).[76]

4.2.2.2. Monitoring Activities

Addressing the vulnerabilities in physical supply chains requires a variety of monitoring activities, which can all be enhanced with technology. For example, auditing their distribution or production facilities and working with specific investigators can help rights holders better understand how counterfeit products get to market and develop appropriate responses.[77] High-tech labeling and authentication technologies can help owners simplify the verification process, reducing the need for rigorous, time-intensive testing and making packaging more difficult to copy. Specific features such as biosensors, radio frequency identification sensors, and holographic labels are highlighted in the research as ways to ensure the legitimacy of goods. One report suggests that manufacturers also put a "guardianship" system in place, where supervisors monitor other employees to prevent the selling/release of proprietary designs and materials.[78]

Effective monitoring is also essential in the online space. Here, rights holders can make great progress with concentrated efforts as 10 e-commerce sites account for 80 percent of all traffic.[79] An efficient program will make use of sophisticated technology that identifies problematic aspects of the advertising ecosystem, the main platforms used by counterfeiters, and certain key payment providers.[80] Industry researchers suggest that rights holders monitor various promotion points as counterfeiters direct traffic to their websites through paid search advertising and tactics like manipulative search engine optimization, cybersquatting, and spam.[81]

4.2.2.3. Notices and Takedowns

These monitoring efforts can lead to enforcement measures such as notices and takedowns, the main ways rights holders currently work with search engines and online portals to remove results and links to counterfeit sites. Large platforms like Google and Bing typically provide rights holders with the tools to do this, while independent groups like Clarivate Analytics' MarkMonitor brand protection firm help them identify this content and then request the removal of such links.[82]

Yet BASCAP (the International Chamber of Commerce's Business Action to Stop Counterfeiting and Piracy program) cautions that notices and takedowns can be time-consuming and costly for

both rights holders and service providers. Google itself acknowledges that 97 percent of the infringement claims are valid, but these statistics mainly concern piracy. Implementing the system for counterfeit goods is more difficult, often requiring many notices before a website is demoted in the search results; it may also require a test purchase or court order to prove infringement.[83]

Generally, rights holders can send cease-and-desist letters to suspected counterfeiters, but they can also take advantage of the programs legitimate sites already offer to remove illegal products more efficiently. Several voluntary initiatives currently in use include eBay's well-known Verified Rights Owner program, which has allowed it to verify reported violations and remove listings "usually in less than 24 hours," and Alibaba's "one-stop" Enhanced Intellectual Property Protection Platform, which uses algorithms and data-modeling to quickly address takedown requests.[84]

4.2.3. Impacts

Unfortunately, the efficacy of the aforementioned strategies and their impacts when implemented are understudied areas within this space. There are no established metrics or benchmarks to measure how effectively a certain strategy deters counterfeiters. However, anecdotal evidence is available, and while the results cannot be generalized, they do illuminate some of these impacts. For example, a report published in 2012 reviewing individual payment processor and International Anti-Counterfeiting Coalition (IACC) programs claimed to find evidence that takedowns are effective.[85] Similarly, a 2013 IACC report noted that 2,100 individual merchant accounts had been terminated for selling counterfeit goods. These accounts were found on 7,500 different websites and utilized 26,000 payment channels.[86] It is important to note, however, that the IACC runs RogueBlock, which is used to assist rights holders in taking down infringing products or websites, making the coalition an entity with a vested interest in such measures.

4.3. Most Relevant Studies

As there did not appear to be any real benchmarking studies on the private sector's response to counterfeiting, reports were considered relevant for this particular section if they clearly explained industry-focused best practices or measured the success and need of such voluntary initiatives. Special attention was given to the roles and practices of intermediaries like advertisers and payment processors as the online marketplace is where most counterfeit goods appear to be sold and distributed. Table 3 highlights these studies, as well as the reports' type and key findings.

Table 3. Most Relevant Studies: Role of the Private Sector

Title (Year)	Type of Report	Key Finding(s)
Addressing the Sale of Counterfeits on the Internet (2017)	Industry	Practical ways internet-related companies can cooperate to address counterfeiting include working with search engines and domain registries to follow recognized best practices and enforce policies/terms of service concerning intellectual property rights.

Title (Year)	Type of Report	Key Finding(s)
Core Criteria for Effective Digital Advertising Assurance (2015)	Industry	Digital advertising assurance providers should follow certain criteria—such as detecting, preventing, and disrupting fraudulent or deceptive transactions—to help companies keep their ads from appearing on websites associated with selling counterfeit goods.
"Internet Payment Blockades" (2016)	Academic	Internet payment blockades can be used to interrupt the flow of money to sellers who profit from counterfeiting. Best practices in using these blockades include legal efforts such as notice and takedown procedures.
"Responding to the Hidden Threat" (2014)	Industry	Luxury rights holders should address counterfeiting by developing tailored strategies that take into account the scope and scale of the problem, thereby creating customized plans that incorporate intellectual property protections and export, customs, retail market controls.
Roles and Responsibilities of Intermediaries (2015)	Industry	Online intermediaries each have a role and responsibility to play in combating counterfeiting. Although many best practices are voluntary, some have been successful in having an impact.
Supporting Innovation, Creativity, and Enterprise (2016)	Government	Strengthening voluntary efforts by parts of the online marketplace (e.g., advertising networks and payment processors) may help curb the flow of illicit revenues associated with counterfeit trade.
"Who are the Guardians in Product Counterfeiting?" (2014)	Academic	The criminological theory of guardianship (i.e., the presence of a capable guardian lessens the likelihood one will commit a crime) can be applied to supply chains to better secure the production and shipment of goods.

5. TRENDS IN COUNTERFEIT TRADE VIA SMALL PARCELS

5.1. Topic Summary

The growth of e-commerce platforms and fast-shipping options has influenced the domestic and international counterfeit markets, alongside more legitimate trade. Products ordered online are generally shipped in small parcels via express or commercial mail services. Although the research has not yet fully assessed the characteristics of the counterfeiters who tend to infiltrate various parts of the small parcels supply chain, government seizure statistics and analyses from brand protection firms shed some light on these parcels' regions of origin and the mechanisms by which they are advertised and sold. Additionally, related academic research may provide machine learning-based solutions to combat online counterfeit trade.

As with other aspects of counterfeiting, "small parcels" lacks a clear and consistent definition. Shipping companies may each have one understanding of what constitutes a small parcel, while government agencies may have another. For this report, "small parcels" refers to any commercial product that is purchased online and sent to a buyer via standard domestic or international shipping methods.

Currently, the research on this topic emphasizes the following four key findings:

- **Regions of Origin:** Research indicates that China, Hong Kong, and India are the primary regions of origin for counterfeit goods shipped via small parcels and seized worldwide—responsible for a combined 92 percent of such trade.[87] Yet further investigation may be worthwhile to assess how these numbers reflect small parcels counterfeit trade in the United States specifically, and the effects of transnational counterfeiting networks on small parcels trade overall.
- **Increases in Volume and Value:** CBP statistics show increases in both the number of small parcels used to ship counterfeit goods and the overall value of the products in those packages (increases of 48 percent and 104 percent, respectively) between FY2011 and FY2018—totals that far surpass the numbers and values of seizures through other shipping options.[88]
- **Platforms/Channels for Counterfeiting:** Although analyses from brand protection firms may help set the groundwork for more studies on counterfeiters' preferred e-commerce platforms, no data could be found to assess their preferred channels for advertising or shipping their goods via small parcels.
- **Frameworks for Resolution:** Resolving the issue of counterfeit shipments via small parcels will involve targeting various parts of the supply chain, including the e-commerce marketplace itself and shipping providers. In particular, machine learning technologies can be harnessed to detect counterfeit goods marketed online, some with accuracy rates upwards of 88 percent.[89]

5.2. Detailed Analysis of the Literature

CBP reports indicate that the rise in e-commerce—"high-volume, low-value shipments purchased via electronic means"—has caused a "sharp increase" in the number of small parcels being shipped from other countries to the United States.[90] In fact, from FY2013 through FY2018, the number of small parcels entering the United States at various ports of entry grew from 226 million to 636 million, an increase of 181 percent.[91] While not all of these packages contain counterfeit goods, counterfeiters are inclined to use them due to a "perceived lower interdiction risk" and "less severe consequences" if the package is seized. As a result, over 90 percent of all intellectual property-related seizures at U.S. borders involve small parcels shipments.[92]

5.2.1. Regions of Origin

In CBP's annual report on intellectual property-related seizures, the agency does not break down the shipping methods of seized goods by region of origin. Therefore, it is not currently possible to assess the international influence of counterfeit trade via small parcels in the United States. Worldwide, however, the OECD notes that China is the largest "provenance economy" of such trade, comprising 60 percent of the total value of small parcels seized between 2011 and 2013.

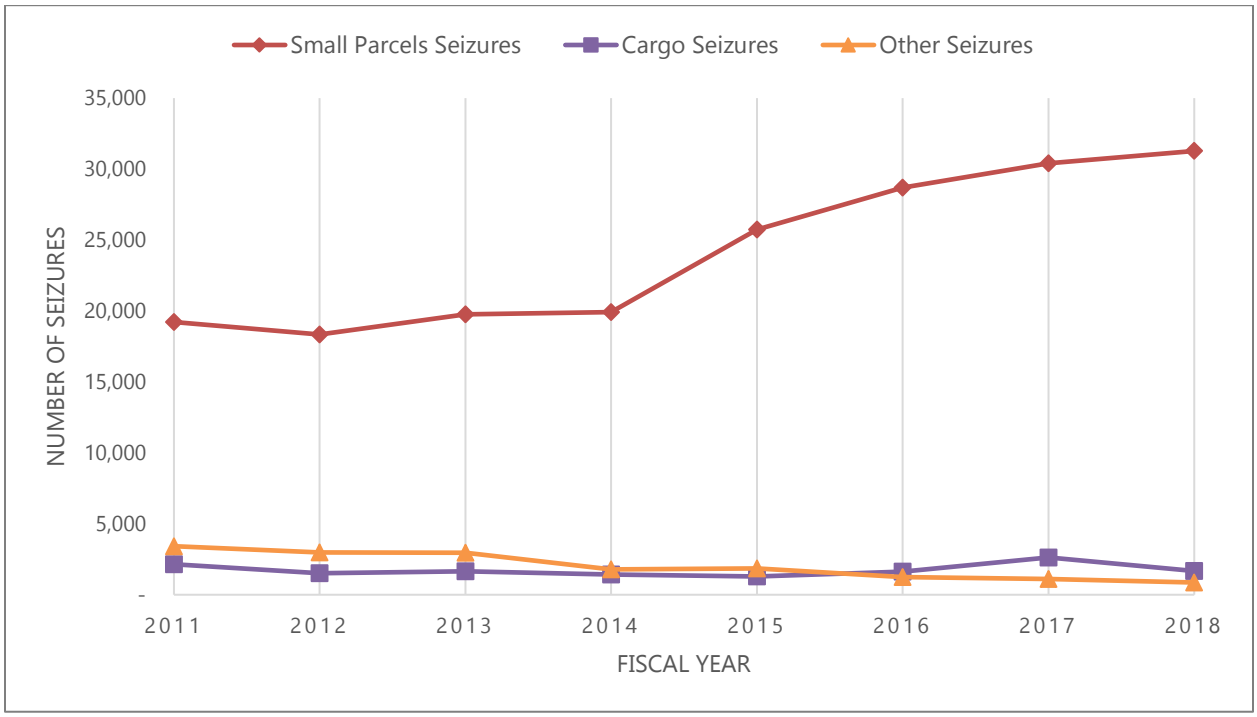
Hong Kong and India follow China, although there is a significant difference between their totals. For instance, Hong Kong accounts for approximately 31 percent of the counterfeit small parcels trade, while India is responsible for just 1 percent of such trade.[93]

Incidentally, in FY2018, these same three jurisdictions were also the top three exporters of counterfeit goods seized in the United States with the highest MSRP (Manufacturer Suggested Retail Price) values, regardless of shipping method.[94] Yet the extent to which these figures may reflect small parcels seizures only remains unknown.

5.2.2. Increases in Volume and Value

As noted, recent CBP totals for counterfeit-related seizures show a dramatic difference between the number of goods seized via small parcels and cargo or other shipping methods. In FY2018, these figures ranged from 31,275 to 2,535, respectively; there has also been a consistently large difference between the categories over time (see fig. 4).[95] The number of small parcels seizures has steadily increased over the years, while the number of seizures from cargo and other shipping methods has declined. Indeed, from FY2011 to FY2018, there was a nearly 48 percent increase in the number of small parcels seized by CBP.[96]

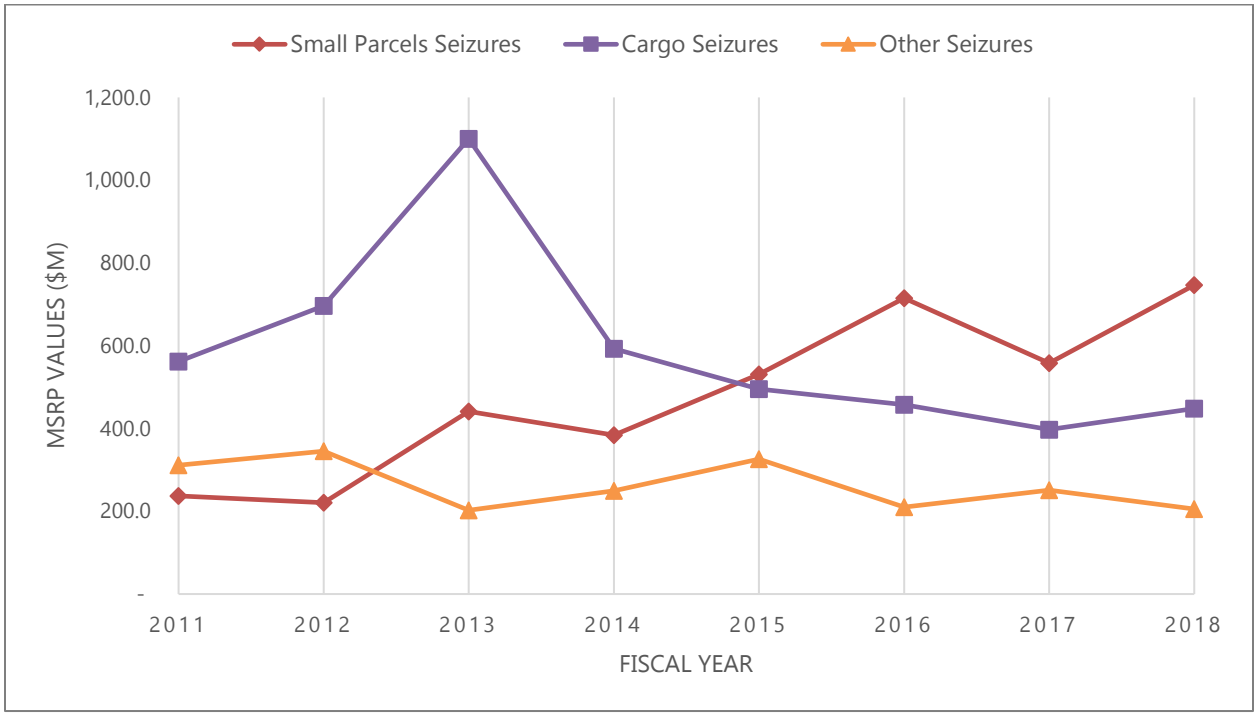
Figure 4. Annual Number of Small Parcels, Cargo, and Other Seizures, FY2011–18



Source: Based on data from DHS, CBP, *Intellectual Property Rights: Fiscal Years 2012–18*.

Since FY2015, the value of small parcels seizures has consistently exceeded the value of cargo seizures. Between FY2011 and FY2018, for instance, there was a 104 percent increase in the MSRP values of small parcels seizures, compared to a 23 percent decrease in the MSRP values of cargo seizures (and a 29 percent decline in the combined values of cargo/other seizures; see fig. 5).

Figure 5. MSRP Values ($M) of Small Parcels, Cargo, and Other Seizures, FY2011–18



Source: Based on data from DHS, CBP, *Intellectual Property Rights: Fiscal Years 2012–18*.

Although the spike in MSRP values for cargo seizures in FY2013 is notable, the research does not explain what prompted such a large shift. It is possible that there was a particularly large seizure that year, but without more specific information, it is hard to say what exactly caused the jump. Still, that does not change the fact that the values for small parcels seizures have steadily increased while those for cargo and other seizures have just as steadily declined.

5.2.3. Platforms/Channels for Counterfeiting

To date, the only research that attempts to link counterfeit goods to particular e-commerce platforms appears to come from industry sources, though their methodologies are not always clear. For example, in 2017, Red Points—one of many brand protection firms that scour the internet for counterfeit products—compiled a list of the top 10 websites featuring replicas of their clients' intellectual property. These platforms are:

- AliExpress (18 percent),
- Facebook (15 percent),
- Tokopedia (14 percent),
- Amazon (13 percent),
- DHgate (11 percent),
- iOffer (9 percent),
- eBay (8 percent),
- JD.com (7 percent),
- Taobao (3 percent), and
- Alibaba (2 percent).[97,*]

Unfortunately, Red Points neither discloses its methodology nor cites a larger body of research to indicate how these findings may reflect online counterfeiting trends as a whole. Thus, its findings can, at best, broadly point to where future, in-depth research efforts are needed.

Similar efforts by MarkMonitor have their own limitations. For instance, in a 2018 consumer survey of adults in France, Germany, Italy, the United Kingdom, and the United States, 26 percent of the respondents said they had purchased counterfeit items from an "online marketplace"; 17 percent said a "smartphone"; 13 percent said a "link in search engine results"; 11 percent each said an "advert using [a] brand logo" and "sponsored social media advert"; 10 percent said a "link in a social post in [a] genuine brand's feed"; and 9 percent said a "link in a social post in [their] feed."[98] Yet the design of this survey does not appear to consider that the above categories may overlap. For example, counterfeit goods purchased via "smartphone" could also have been purchased in an "online marketplace." Therefore, the true nature of how these consumers may have found the counterfeit items remains unknown.

5.2.4. Frameworks for Resolution

Efforts to curb counterfeit trade via small parcels should target all three parts of the supply chain (i.e., regions of origin, ports of entry, and online marketplaces), as well as postal systems more generally. The Universal Postal Union, for example, sets international postal rates using a variety of economic and development factors. Because of this, it is cheaper to ship a 500-gram package from Beijing to Chicago than it is to ship a similarly sized package from San Francisco to Chicago.[99] Loopholes like this may incentivize the use of small parcels to ship counterfeit goods to the United States.

Yet regardless of the shipping method, techniques such as microscopic imaging could potentially help CBP agents confirm the authenticity of various materials (e.g., fabrics and leather) and objects (e.g., electronics, pills, shoes, and toys).[100] For instance, wide-angle microscopy devices can be

[*] Three of these platforms—AliExpress, Taobao, and Alibaba—are part of the Alibaba Group, a Chinese conglomerate that, as of May 2019, is "the largest retailer in the world," surpassing both Wal-Mart and Amazon (Alibaba Group, "Our Businesses," accessed August 30, 2019, https://www.alibabagroup.com/en/about/businesses; Rebecca McClay, "10 Companies Owned by Alibaba," Investopedia, last updated May 17, 2019, https://www.investopedia.com/insights/10-companies-owned-alibaba/).

connected to mobile phones to both capture and process this imagery, allowing for a low-cost, high-quality solution. And since microscopic features are inherent to the products themselves, they do not need to be tagged beforehand.

As for online sales of counterfeit goods, popular e-commerce platforms have implemented automated counterfeit product detection systems to serve specific brands. Amazon's Project Zero, for one, an invite-only platform, uses "machine learning" to scan over 5 billion product listings a day on behalf of various rights holders. The company claims that it stops 100 times more suspected counterfeit products than manual removal, but the exact methodologies Amazon uses are unknown, making it difficult to verify this assertion.[101]

Another approach to online counterfeit detection systems involves classifying suspect websites that appear in search results for specific products. Though this only works at the website level (as opposed to the product level), this is the only type of online detection that has been empirically tested.

The two studies that have taken this approach both use algorithms to classify websites as being linked to counterfeit or legitimate sellers. In one study, the features used to build the classifier include pricing trends, merchant contact information, payment options (i.e., Western Union only), website registration information (WHOIS), keywords found in the URLs, and general domain name characteristics.[102] In the other study, these features included page-level HTML elements (e.g., large iframes), URL characteristics, and WHOIS information.[103] With accuracy rates of 88 percent and 86 percent, respectively, these approaches are promising, although they assume that consumers are finding counterfeit items through search results consisting of various independently owned websites rather than large e-commerce platforms. The extent to which this may represent the true nature of how consumers tend to purchase counterfeit products online remains unknown.

5.3. Most Relevant Studies

As none of the articles initially collected by the research team were deemed relevant enough for inclusion, the author of this section conducted searches in digital libraries for the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers. They also looked at the citations in key publications, such as those produced by the OECD and U.S. government. General internet searches were particularly useful in tracking down industry research. See table 4 for the most relevant studies included in this section.

Table 4. Most Relevant Studies: Trends in Counterfeit Trade via Small Parcels

Title (Year)	Data Source(s)	Key Finding(s)
"Counterfeit Goods are a $460 Billion Industry, and Most are Bought and Sold Online" (2017)	Data Collection and Analysis	E-commerce platforms are attempting to combat counterfeiting, although the results are limited to the firms' clients and in-depth methodologies are not given.
"Discovering Product Counterfeits in Online Shops" (2014)	Independent Study	A possible framework for resolving online counterfeiting involves examining specific product offers. The authors, however, provide no proof of concept or empirical evidence to support this claim, although it seems similar to counterfeit detection methodologies used by larger e-commerce sites.
"The E-Commerce Market for 'Lemons'" (2015)	Independent Study	A possible framework for resolving online counterfeiting involves classifying websites according to seller, but this can only be tailored to specific products on third-party websites.
"The Fake vs Real Goods Problem" (2017)	Independent Study	Microscopic imaging can be used to confirm the authenticity of a variety of goods via a lens attached to a mobile phone, making this a low-cost solution for CBP and other customs agencies.
Intellectual Property Rights: Fiscal Year 2012–18 Seizure Statistics (2013–19)	Data Collection and Analysis	Together these reports summarize the trends in small parcels seizures, which have increased in both volume and value over the past several years.
"Knock It Off" (2017)	Independent Study	Like "Lemons," this describes a possible framework for resolving online counterfeiting that involves classifying websites according to seller, but this too can only be tailored to specific products on third-party websites.
Misuse of Small Parcels for Trade in Counterfeit Goods (2018)	Data Collection and Analysis	One way to curb counterfeiting via small parcels is to reform various postal systems, which currently make it cheaper to ship something internationally to the U.S. than to send something domestically through USPS.
Online Barometer: Global Shopping Surveys (2018)	Survey Responses	Some consumers who have knowingly purchased counterfeit goods online will admit to buying these items, although the responses' phrasing does not lend itself to the larger online counterfeit market.

6. RISKS OF COUNTERFEIT GOODS TO PUBLIC HEALTH AND SAFETY

6.1. Topic Summary

Across the world, counterfeit goods pose significant risks to public health and safety, including injury, illness, and death. Affecting nearly every industry, counterfeit items are found in an array of products—from personal care items to automotive, aircraft, and electrical parts, to defense equipment and pharmaceuticals, foods, and beverages. Recent incidents, such as the case of a counterfeit Pond's cream that left one woman in a coma and the deaths and lung injuries due to fake vaping products, underscore these concerns.[104] Yet while the existing literature touches on the risks posed by counterfeit goods, there are few comprehensive examinations of these issues and data quantifying the impact of the risks are not available. Instead, anecdotal evidence and seizure data are used in the case studies, raising questions about the reliability of the research.[105]

A review of the existing literature on this topic highlights several areas of interest:

- **Key Industries:** Although counterfeiters target all products, there is substantial research on only a handful of industries and supply chains. The existing studies are heavily focused on pharmaceuticals, with limited anecdotal information available on the defense supply chain, foodstuffs, and other industries.
- **Limited Field of Study:** The lack of analyses on the scope and nature of the public health and safety risks posed by counterfeit goods demonstrates a critical need for additional research. Indeed, very few academic journals have published materials directly addressing the topic.[106] The majority of the published literature focuses on low-quality pharmaceuticals, including substandard, spurious, falsely labeled, and falsified drugs, often to the exclusion of other areas of interest.[107] Moreover, the research does not properly address concerns related to data sources or methodologies.

Substandard medicines are authorized by national regulatory authorities, but fail to meet either national or international quality standards/specifications—or, in some cases, both.

Spurious medical products deliberately or fraudulently misrepresent their identity, composition, or source.

Falsely labeled or **falsified** medicines may contain no active ingredient, the wrong active ingredient, or the wrong amount of the correct active ingredient. They also often contain corn starch, potato starch, or chalk as some sort of filler.

- **Data Collection Issues:** As noted, there is little to no data on the prevalence of health and safety consequences due to counterfeit goods.[108] Neither government agencies, nor non-governmental organizations, nor academic institutions have gathered these figures.[109] As a result, it is difficult to comprehend the full scope and magnitude of the issue. Relationships can be inferred, but no conclusive statements can be made.
- **Online Marketplaces:** As with other illicit products, counterfeit drugs are increasingly sold online, a shift exacerbated by drug shortages and increased health costs.[110] Consumers seek and use online pharmacies in an effort to find cheaper drugs that—while accessible—are often counterfeit, unregulated, or tampered with in some form.[111] These medicines account for 50 percent of all drugs sold online, while 99 percent of online pharmacies are not even compliant with patient and pharmacy standards.[112] The relationship between other counterfeit commodities and online sales has not been explored, although changes in the domestic and international counterfeit markets suggest that a variety of goods posing certain health and safety risks are being sold via e-commerce.

6.2. Detailed Analysis of the Literature

Of the 33,810 shipments CBP seized in FY2018, 5,329 contained counterfeit items posing potential health and safety risks to U.S. consumers; these figures represent a 56 percent increase over FY2012.[113] Although the published research focuses predominantly on pharmaceuticals, personal

care products, and military-related equipment, there is little in the literature to highlight their specific associated health risks.

6.2.1. Key Industries

CBP seizure statistics show that a diverse range of counterfeit products are being brought into the United States, including footwear; apparel; accessories like watches, jewelry, handbags, and wallets; optical media, computers, and electronics; personal care items, and pharmaceuticals.[114] Albeit unique, each product category contains elements that can cause physical harm or injury to consumers.

6.2.1.1. Personal Care Products

Counterfeit personal care products are of crucial concern due to their widespread application in daily use. These unregulated goods may be composed of substandard elements that can cause harm, injury, or adverse reactions. Frequently seized items include baby oils, condoms, contact lenses, cosmetics, deodorants, hair curlers, lip balms, perfumes, shampoos, and soaps.[115] These particular goods can expose consumers to, among other consequences, hazardous chemicals and contaminants and the risks of ineffective family planning or burns/electrocutions due to faulty wiring.

6.2.1.2. Automotive, Aircraft, and Electrical Parts

The U.S. automotive industry is another part of the market affected by counterfeiting. For example, federal and state investigations have uncovered counterfeit airbags; bearings; seat belts; steering and braking components; and diagnostic equipment, all of which pose serious safety concerns.[116] Similarly, industry experts have suggested that up to 10 percent of the spare aircraft parts sitting in warehouses across the United States are either unapproved, counterfeit, stolen, or lacking the correct paperwork. This counterfeit market in particular is "virtually unregulated and includes more than 5,000 brokers." Moreover, it is believed to be a largely domestic issue as resolved cases and seizure statistics indicate there are more counterfeit aircraft parts produced in the United States than imported from other countries.[117]

With regard to counterfeit electrical components, an increasing number of customer complaints indicates there is a growing risk to public health and safety. More often than not, counterfeit goods come in the form of an entire product. However, complexities can arise when counterfeit parts are unintentionally used in legitimate items. For example, counterfeit batteries may contain potentially explosive and volatile components while counterfeit cabling may lack the correct insulation, raising the chances of melting or fire.[118]

6.2.1.3. Defense Supply Chain

Counterfeit parts in the defense supply chain are particularly worrisome as they can impact things like weapons and communication devices—threatening U.S. national security, the lives of military personnel, and critical operations. As with other incidents of product counterfeiting, the numbers of suspect components are only growing. For instance, a survey conducted by the U.S. Department of Commerce found that such incidents more than doubled from 3,369 in 2005 to 8,644 in 2008. A few years later, Senate Armed Services Committee hearings in 2011 and 2012 identified "more than 1,800 cases of counterfeit electronic parts and one million individual suspect parts supplied [to the U.S. Department of Defense] by over 650 companies in 2009 and 2010."[119] Furthermore, recent studies highlighting the threats "associated with more harmful, safety-critical counterfeit markets" identified hundreds of counterfeit microchips in the defense supply chain, indicating that this is a continuing concern.[120] Likewise, the U.S. Department of Homeland Security found that 15 percent of all spare and replacement microchips purchased by the Pentagon are counterfeit.[121]

6.2.1.4. Pharmaceuticals

Although these previous cases of counterfeiting are worrisome, it is the nation's medicinal supply chain that is most highly threatened. Branded and generic drugs treating all sorts of illnesses are susceptible to counterfeiting. Globally, the most commonly counterfeited medications are those meant to treat cancer, depression, and schizophrenia, as well as help patients manage their blood pressure, cholesterol, and insulin levels.[122] In high-income countries like the United States, lifestyle drugs such as Viagra or cancer medications are more likely than anti-infectives to be counterfeit.[123]

The World Health Organization defines **counterfeit medicines** as "medicines that are mislabeled deliberately and fraudulently."

The negative effects of counterfeit medicines—which are often made in unhygienic conditions by untrained or unlicensed manufacturers—include blindness, burns, headaches, rashes and swelling, and even death.[124] Yet while an overall number of deaths attributable to counterfeit medications is not readily available, there are documented cases that state these totals for particular incidents. In Pakistan in 2012, for example, more than 200 patients died after ingesting a contaminated hypertension drug. Six years earlier, 219 people died in Panama after receiving a cough syrup laced with diethylene glycol, a cheap substitute for pharmaceutical-grade glycerin.[125]

Counterfeit drugs containing no or limited active ingredients nonetheless pose a threat to public health and safety.[126] By substituting genuine pharmaceuticals with substandard medicines in sub-therapeutic amounts, patients do not receive the life-saving care they need. This becomes especially problematic when the drugs with inadequate concentrations of active ingredients replace authentic medications, as this could lead to an emergence/spread of drug resistance.[127]

For instance, artemisinin-resistant plasmodium strains (parasites that decrease the effectiveness of malaria pills) emerging at both the Thailand–Cambodia and Thailand–Myanmar borders may be attributed to substandard medications.[128]

6.2.1.5. Foods and Beverages

According to the U.K. Food Standards Agency, in 2006, up to 10 percent of all foods purchased in the country could have been affected by fraud. The risks of such food fraud include adulterated, misbranded, or simulated products that result in public health threats. Although the health and safety consequences of counterfeit foods are often direct (i.e., presenting an immediate or imminent risk), they can also be indirect.[129] Two examples of potential public health risks associated with seafood include undeclared allergens and toxins from locations where harvesting is banned, and farmed products mislabeled as "wild."[130]

> **Food fraud** is a "term used to encompass the deliberate and intentional substitution, addition, tampering, or misrepresentation of food, food ingredients, or food packaging; or false or misleading statements made about a product, for economic gain."
>
> **Indirect food fraud** occurs when a consumer is "put at risk through long-term exposure—build up through ingestion of low doses."

6.2.2. Limited Field of Study/Data Collection Issues

Currently, the existing research is limited in scope, leaving a number of challenges unaddressed.[131] The literature touches on the risks posed by counterfeit goods to consumer health and safety, but does not adequately address these risks in depth. For example, harm, injury, illness, and death are cited as impacts of counterfeit goods. However, data quantifying the extent of these impacts, such as the number of individuals affected, are often not available. As such, much of the research relies on anecdotal evidence to support its assertions.[132] Similarly, seizure data—which are the primary tools used to quantify the domestic and international markets—provide only baseline values rather than a comprehensive measurement of counterfeit trade.[133]

6.2.3. Online Marketplaces

As already noted, the internet is changing the way counterfeit goods are marketed and sold, but these areas of focus have not been adequately explored in relation to public health and safety risks. While there is research looking at the online sales of counterfeit pharmaceuticals, similar sales of other products are not being explored in depth. This reality is likely due to the rapid rise of counterfeit medications, which the World Health Organization says account for 50 percent of the medicines sold online.[134]

Experts suggest this increasing prevalence of counterfeit drugs could be due in part to the rising costs of medicine in the United States. As quality healthcare continues to become more difficult

and expensive to access, the demand for cheaper medications will continue to increase.[135] Yet in seeking out less expensive, but more readily available alternatives, consumers could be putting themselves at risk. For example, a recent survey conducted by the National Association of Boards of Pharmacy revealed that 99 percent of the 10,000 online pharmacies that responded were not compliant with the associations patient and pharmacy practice standards.[136]

6.3. Most Relevant Studies

Reports were deemed relevant for this section if their findings focused on the health and safety risks posed by counterfeit goods, provided valuable insights and information on research gaps in the current literature, or addressed the impacts of those gaps on the field. Table 5 highlights these studies, as well as their key findings.

Table 5. Most Relevant Studies: Risks to Public Health and Safety

Title (Year)	Type of Report	Key Finding(s)
"A Challenge for Healthcare but Just Another Opportunity for Illegitimate Online Sellers" (2018)	Lit. Review	Various practices, such as updated internet pharmacy verification databases and revised medication-use policies, can be used to both mitigate the threats posed by counterfeit medicines and discourage their sale.
"Counterfeit Goods and the Public's Health and Safety" (2003)	Systematic Review	As with studies on other aspects of counterfeiting, reports on its medical consequences have been hampered by a lack of data sources. Recommendations for solving this issue include enforcing public health and safety regulations and increasing collaborations among constituencies.
"Defining the Public Health Threat of Food Fraud" (2011)	Research Study	Public health threats from food fraud can occur as many of the current intervention methods are ill-equipped to detect unexpected contaminants.
The Economic Impacts of Counterfeiting and Piracy (2017)	Lit. Review	In any field survey, substandard/counterfeit medicines should be identified through chemical and physical analysis, source authentications, and package inspections.
"The Health and Economic Effects of Counterfeit Drugs" (2014)	Lit. Review	Counterfeit drugs constitute a significant portion of the U.S. drug market and the percentage is rising, especially with the introduction of online pharmacies.
Hearing on Counterfeits and their Impact on Consumer Health and Safety (2016)	Senate Hearing	Dangerous counterfeits, including pharmaceuticals, electronics, and automotive/aviation parts, increase consumers' risk of harm, injury, or death. Encouraging the e-commerce industry to actively remove listings for counterfeit goods is one way to improve public safety.
"Rise in Online Pharmacies Sees Counterfeit Drugs Go Global" (2015)	Lit. Review	The counterfeit drug market, which is growing as some countries produce more of these medicines, is worth an estimated $70B–$200B. The increased presence of these drugs in the marketplace can lead to serious illnesses or death. As a result, healthcare systems are being strained and experiencing increased costs.
"Substandard and Counterfeit Medicines" (2013)	Lit. Review	The occurrence of substandard/counterfeit medications significantly increases when purchased from unlicensed sources. Online counterfeit sales are common and being addressed in a variety of ways, although their prevalence is higher in lower- and lower-middle income countries.

7. TRENDS IN CONSUMER ATTITUDES TOWARD COUNTERFEIT GOODS

7.1. Topic Summary

The research literature on U.S. consumer attitudes toward counterfeit goods focuses almost exclusively on intentionally purchased products—that is to say, purchases of counterfeit goods where there is no attempt by the seller to deceive the buyer. No research studies were found that focused specifically on U.S. or non-U.S. consumer experiences with unintentionally purchased counterfeit products. While American and foreign researchers have published academic studies on deceptive advertising and its effects on consumer perceptions of brands, no studies were found that focused exclusively or substantially on such deception in the context of marketing counterfeit items. To the extent that deceptive purchases are addressed in the literature, they are a side note within broader studies of counterfeit purchasing behaviors more generally.

As with many of the other aspects of counterfeiting, data collection in this space is hindered by the unreliability of self-reporting, limited sample sizes, and other issues. The research is focused almost exclusively on consumer awareness and intentions, with little examination of the role of deceptive and non-deceptive marketing practices. In fact, none of the available studies include even rudimentary estimates of the value or volume of counterfeit goods sold via such means.

The following key findings can be drawn from the current research on this topic:

- **Limited Field of Study:** While a range of institutions and industry groups are conducting research on this topic, the scope of that work is limited and does not include estimates of the total numbers of counterfeit goods sold or the methods used to make those sales. For example, the Better Business Bureau estimates that only 10 percent of those impacted by counterfeiting take action, which thus prevents an overall understanding of the true scope of the issue.[137]

- **Consumer Behaviors, Motivations, and Intentions:** Still, these studies provide key insights on the populations more likely to intentionally buy counterfeit goods, as well as consumers' awareness of and attitudes towards such products. According to the reports, one's age, education level, gender, and internet usage are all variables in their likelihood to knowingly purchase counterfeit items. Research has found, for instance, that 18- to 34-year-olds are twice as likely as older consumers to knowingly buy counterfeit products, while 32 percent of intentional buyers of counterfeit goods use social media daily to weekly.[138]

- **Selling Techniques:** In addition to connecting buyers and sellers more readily, the online marketplace is making it easier for counterfeiters to use stolen images and branding when selling their products. Advances in materials and the increased accessibility of technology have also made it possible for counterfeiters to manufacture goods of higher quality than in the past.

7.2. Detailed Analysis of the Literature

The studies currently available on this topic focus on three main areas: a consumer's opinion toward counterfeit goods; whether the consumer has ever purchased a counterfeit product, either intentionally or unintentionally; and whether the consumer plans to intentionally purchase such goods in the future. Some studies focus on specific subgroups (e.g., online consumers, students, and young people), while others poll the general populations of entire countries. These studies do not, however, address the total value of counterfeit products purchased by consumers, only whether they have made counterfeit purchases in the past.

7.2.1. Limited Field of Study

The domestic and international counterfeit markets are difficult to quantify, both as a whole and in relation to specific focus areas. This is particularly true for those who study illicit purchases, as self-reporting has significant disadvantages. Few people who unintentionally buy counterfeit goods report the purchases; indeed, the Better Business Bureau estimates that only 10 percent of those impacted by counterfeiting pursue action via either the bureau or law enforcement.[139] These limitations make it nearly impossible to identify the most common or most successful methods of selling counterfeit goods, despite some limited study into how these products are marketed.

Of the few marketing studies that have been published since 2012 on public attitudes toward product counterfeiting in the United States, industry firms and university-based research teams account for nearly all of them. Yet the documentation of the research and sampling methods used varies substantially. The reports produced by marketing firms contain little documentation of the selected methodologies, while academic studies tend to provide more detailed descriptions of both the sampling methods and findings.

Since the 1980s, opinion research organizations and academic research teams have polled U.S. consumers on their attitudes toward counterfeit products. Industry groups and rights holders typically partner with commercial research organizations to gauge public opinions on product counterfeiting, in both general terms and with respect to certain categories of goods. Surveys sponsored by rights holders tend to be narrowly focused on the types of products sold by the sponsoring company, such as luxury goods, personal electronics, or sports apparel. These surveys are usually proprietary to the sponsoring organization and any public release of the results is typically limited to a summary of the findings or a press release on the company's website, both of which rarely describe the administration of the surveys or sampling methods in detail.

Within academia, researchers from various social science fields have published studies on consumer behaviors related to counterfeit products, including luxury fashions, foods and drugs, personal electronics, and sporting goods. These studies tend to delve more deeply than industry-

sponsored reports into the behavioral aspects of such consumption. Academic surveys also tend to be better documented than industry-sponsored studies, usually resulting in peer-reviewed journal articles that describe the research methodologies in substantial detail.

Several factors may explain why only one study was found that addresses consumers' experiences with deceptive counterfeit goods.[140] First, because the self-reporting of such purchases is likely to be unreliable, researchers may be hesitant to rely on survey methods in this particular area. While some consumers may realize that they have unintentionally purchased a counterfeit product immediately upon receiving it, others may continue to be deceived even after taking possession of the item. Further, some dissatisfied consumers may incorrectly assume that a genuine product is a deceptive counterfeit. In such instances, their report of the perceived deception would be inaccurate. As two German market research specialists have noted, the distinction between objective and perceived deception poses methodological challenges for researchers seeking to understand the effects of such marketing strategies.[141]

Human factors may also come into play. For example, survey respondents' natural unwillingness to admit to having been deceived may limit the accuracy of studies on deceptive counterfeit purchases. While the challenges associated with such studies may be surmountable, the added complexity involved may account for the scarcity of these experiences. However, experts on product counterfeiting have recognized a need for more in-depth studies on the role of deception in counterfeit purchasing behavior.* Questionnaire items that ask respondents to estimate the value of their deceptive counterfeit purchases or that prompt them to describe the deception methods they have encountered are two potential options that could be developed.

7.2.2. Consumer Behaviors, Motivations, and Intentions

Although researchers are unable to measure the volume of sales made using deceptive or non-deceptive techniques, the studies reviewed do offer insights into consumer attitudes towards counterfeiting and the prevalence of counterfeit purchases. For instance, one multinational survey found that, on average, 80 percent of the consumers surveyed reported having purchased some kind of counterfeit or pirated product at least once. This ranged from a high of 96 percent for Russian consumers to a low of 46 percent for U.K. purchasers.[142] According to another report that surveyed respondents from 10 countries, more than a quarter of the consumers (27 percent) have unknowingly purchased counterfeit goods. Among the products sold via deceptive practices, makeup was the most common, followed by skincare, haircare, and supplements. Sixteen percent of the multinational sample had also unknowingly purchased counterfeit medicines. With regard

* In a 2006 review article, for example, two German marketing professors noted that "integrating the degree of deceptiveness in further research on counterfeiting may be a fruitful step" (Eisend and Schuchert-Güler, "Explaining Counterfeit Purchases," 17).

to intentional purchases of counterfeit products, 83 percent of the respondents said they would not buy them, while 17 percent said they would.[143]

Similar research on the U.S. market specifically is limited, with the exception of Michigan due to the state university's work in this space. One study, for instance, found that 16 percent of the residents surveyed had knowingly purchased counterfeit goods, while another 10 percent had unknowingly purchased such items.[144] A second report focusing on Michigan found that 22 percent of the survey respondents had purchased a counterfeit good in the past, either knowingly (10 percent) or unknowingly (12 percent), while 19 percent were unsure if they had made such purchases. Respondents who unknowingly bought counterfeit goods were more dependent on the internet for shopping than those who had never purchased counterfeits, with 59 percent saying they made at least half of their purchases online.[145]

Along with consumer behaviors, the current research reveals insights to the motivations behind both deceptive and non-deceptive counterfeit purchases, despite the lack of study into what share of counterfeit sales each strategy represents. Using various search-term metrics, for example, MarkMonitor identified the consumers most vulnerable to making unintentional counterfeit purchases as brand-loyal bargain hunters. The company notes that "while some consumers opt for a counterfeit when the original proves too expensive, other consumers can be so intent on purchasing their brand of choice that they unknowingly shop at sites selling counterfeits while seeking a bargain."[146] It concluded that the majority of consumers are unwilling to buy counterfeit products online—not for security reasons, however, but because they prefer the genuine items and have moral objections to buying counterfeit goods.[147]

Similarly, a report commissioned by BASCAP reveals common patterns in consumer decisions to intentionally buy counterfeit and pirated goods. The researchers found that consumer purchase behaviors are influenced by a number of drivers and deterrents:

- **Drivers:** An inability to afford the genuine item; a perception that the genuine item is overpriced, and so purchasing a counterfeit is justified; and a lack of awareness that an item is counterfeit.
- **Deterrents:** An awareness of potential health risks; a sense that a poorly made counterfeit may be a waste of money; and an idea of foregoing the benefits of a genuine purchase, such as services and warranties.[148]

With regard to consumers' intentions, researchers suggest in "The Face of Fakes" that gender and education level are the two variables most frequently related to one's beliefs and perceived ethics toward buying counterfeit goods. For example, female respondents were more likely to hold positive beliefs about counterfeit fashion products, while their male counterparts were more

favorably disposed toward pirated films. Consumers with higher educational levels were also more resistant to the idea of buying counterfeit goods, suggesting that one's education increases, their purchase intentions decrease and their beliefs about counterfeits become more negative.[149]

Age seems to be another indicator of purchase intentions when it comes to counterfeit goods. Buyers intentionally purchasing these items tend to skew younger—as a whole, 18–34-year-olds are twice as likely as older consumers to knowingly buy counterfeit products.[150] These correlations are supported by the report *Gen Z Insights*, which found that nearly 80 percent of the respondents between the ages of 18 and 23 had reported purchasing counterfeit products in the past year.[151] However, the survey did not ask respondents to distinguish between intentional and unintentional counterfeit purchases, and its underlying assumption was that all of the counterfeit purchases reported were non-deceptive in nature.

Intentional buyers of counterfeit goods are often heavier users of online shopping, which also suggests links between younger consumers and counterfeit purchases. These links extend to intentional counterfeit purchases and social media use, specifically on Instagram—32 percent of these buyers use Instagram daily to weekly, compared to 21 percent of those who have never purchased a counterfeit item.

7.2.3. Selling Techniques

The online marketplace is quickly revolutionizing the way counterfeit items are sold, as well as the ways in which these goods are marketed. While products sold in person must appear authentic, in online transactions, it is the sellers themselves who must appear legitimate. Deceptive tactics used online include taking photos from legitimate sellers and repurposing them to advertise counterfeit goods or buying "likes" and followers on social media accounts to lend credibility to profiles.[152] These techniques are also helpful for web-based, non-deceptive sellers, who are able to market their items as "just as good" as the real thing regardless of the product's actual quality.

The role of technology in shaping the domestic and international counterfeit markets has been multifold—and has the potential to change how consumers view certain counterfeits. Sellers adapt quickly to ongoing advances in materials, online communications, and shipping techniques, which impacts not only how a good is marketed, sold, or shipped, but how it is made. One example is "super fakes," counterfeit products of extremely high quality. Whereas many counterfeits are made of cheaper materials or have noticeable defects, super fakes are close enough in quality to genuine products that they are difficult to detect and often sell at prices close to those of legitimate items.[153] Another example is the spread of 3D printing, which allows those with access to 3D printers to make exact replicas of nearly any item. Although there are no studies that look at the role of 3D printing in counterfeiting as of yet, it is an area of concern given the growing availability of this technology.[154]

7.3. Most Relevant Studies

Many of the most relevant reports for this section collected their data from survey instruments, although a few relied on interviews and web analytics. All of them, however, focused on different aspects of consumers' attitudes toward counterfeit goods. Studies looking exclusively at U.S. consumers were prioritized over those examining the attitudes of non-U.S. consumers, yet several multinational studies that include the United States and break out those results were considered. Some European-focused studies were also included as a basis for comparison. Table 6 describes the most relevant studies' findings, as well as their population samples and sample sizes.

Table 6. Most Relevant Studies: Trends in Consumer Attitudes

Title (Year)	Pop. Sample	Sample Size	Attitudes, Behaviors, or Beliefs Measured
Annual Survey Study of Product Counterfeiting by Michigan Residents Utilizing the State of the State Survey (2013)	Adults from Michigan	1,000	Attitudes toward counterfeiting and stricter anti-piracy laws; past online purchases of prescription medicines.
"Counterfeit Luxury Goods Purchase Motivation" (2015)	College-Age Adults from China and U.S.	347	Attitudes toward counterfeiting; willingness to admit past purchases of counterfeit goods.
"Counterfeiting in the United States" (2007)	U.S. Adults	1,000–4,300	Attitudes toward counterfeiting and stricter anti-piracy laws; past purchases of counterfeit goods.
"The Face of Fakes" (2014)	U.S. Consumers	305	Attitudes toward counterfeit fashions.
Gen Z Insights (2019)	U.S. Adults Aged 18–23	1,250	Attitudes toward counterfeiting; past purchases of counterfeit goods.
Intellectual Property (2018)	U.S. Adults	1,000	Attitudes toward counterfeiting and anti-counterfeiting policies.
"Men and High-Earners are More Likely to Buy Counterfeit Goods" (2019)	U.S. Adults	1,691	Attitudes toward counterfeiting and "knock-offs"; past purchases of counterfeit goods.
Online Barometer: Global Shopping Surveys (2014, 2016–18)	Adults from China, Denmark, France, Germany, Italy, Netherlands, Spain, Sweden, U.K., and U.S.	—	Attitudes toward counterfeiting and anti-counterfeiting enforcement; past purchases of counterfeit goods; and exposure to rogue websites and false advertisements.
"Research Report on Consumer Attitudes and Perceptions on Counterfeiting and Piracy" (2010)	Adults from India, Mexico, Russia, South Korea, and U.K.	1,000/country	Attitudes toward counterfeiting; counterfeit purchase behaviors.

8. USE OF SOCIAL MEDIA TO FACILITATE COUNTERFEIT TRADE

8.1. Topic Summary

Over the past few years, social media platforms have dramatically altered the ways in which consumers buy, rent, and sell certain products (e.g., clothing, electronics, and luxury goods).[*] As a

[*] "Social media platforms" are defined as websites "through which users create online communities to share information, ideas, personal messages, and other content (such as videos)" (Merriam-Webster, "Social Media," accessed September 25, 2019, https://www.merriam-webster.com/dictionary/social%20media).

result, the ways in which the domestic and international counterfeit markets operate have changed as well. Understanding the mechanisms by which these platforms knowingly or unknowingly facilitate counterfeit trade is critical to properly addressing the issue. However, the current literature is sparse. This is likely due to the fact that social media are a predominantly 21st century creation, which naturally limits the size of the related research body.

Although there are significant data collection issues and most of the existing studies rely on small sample sizes and unclear methodologies, their findings suggest that counterfeit goods could account for a significant portion of the products purchased and advertised on social media, especially in specific industries, such as luxury fashions and pharmaceuticals.

The studies conducted on this topic indicate that these two key findings are particular areas of interest:

- **Social Media as "Wild West":** Researchers agree that counterfeit goods are a significant problem on social media platforms. On Instagram alone, counterfeit activity grew by 171 percent between 2016 and 2019.[155] In addition to certain promotional features that enable users to buy items directly through the apps themselves, the international dimension of the sites makes it possible for individuals to act alone. These smaller operations are often more difficult to identify and disrupt.
- **Limited Field of Study:** Although media coverage of this issue is substantial, the reporting is based on a small number of studies, including some with questionable credibility. While the OECD has conducted some work on digital counterfeit markets, researchers affiliated with A-CAPP appear to have authored the most reports. Ghost Data Analytics—a two-year-old "innovative and disruptive project that applies advanced techniques [to] data analysis"—is heavily cited, although there is little formal research supporting its findings.[156]

8.2. Detailed Analysis of the Literature

As noted by the OECD and EUIPO, "the online environment has, for a long time, been very attractive to counterfeiters/pirates for reasons such as anonymity, flexibility, [and] market scope." Websites are accessible around the clock and often enable counterfeiters to sell goods with relative impunity.[157] In the past decade, these sites have been joined by social media platforms, encrypted messaging services, online payment systems, and other digital tools, which have all made web-based counterfeiting that much easier. Social media, in particular, offer many of the same benefits as e-commerce, while bypassing the regulations created by traditional companies (e.g., Amazon and eBay) to deter counterfeiters.[158]

Much as the internet has been tied to counterfeiting for decades, so too have rogue actors. Organized, transnational criminal networks in particular have longstanding ties to counterfeiting. According to the U.N. Office on Drugs and Crime, it is the second-largest funding source for these

networks, accounting for 40 percent of their revenue; drug trafficking is still the largest source at 50 percent.[159] Over the years, specific links have been found to groups such as the Irish Republican Army, La Cosa Nostra, and the Revolutionary Armed Forces of Colombia.[160]

Yet the involvement of these criminal networks is largely anecdotal and depends in part on the industry in question. Counterfeit pharmaceuticals sold via social media platforms in Europe, for example, have been delivered to "drop shippers"—intermediaries who receive the counterfeit goods before sending them on to their final recipients—via collaborations between organizations that oversee different parts of the transportation routes.[161]

8.2.1. Social Media as "Wild West"

Social media platforms have become the preferred online marketplaces for counterfeiters, due in part to the increased protections and regulations on e-commerce sites like Amazon and eBay.[162] Researchers agree that significant numbers of counterfeit goods are being sold or promoted across these channels, including mainstream sites like Facebook and Instagram, as well as smaller, more specialized forums. It is important to note, however, that there are no estimates for the overall scope of the online counterfeit market, as most organizations do not include these sales in their measurements.

The quantitative data that do exist indicate that counterfeiting is a significant problem on social media. One report in particular cites a 2014 study by two Italian cybersecurity experts that found nearly a quarter of the posts advertising luxury goods on Facebook could be linked to counterfeit sellers.[163] A report by the U.K. Intellectual Property Office reached similar conclusions, finding that Facebook's private groups were counterfeiting havens—around 40 percent of all communications in these spaces involved possible intellectual property rights infringements.[164]

Two particular government efforts to address the volume of counterfeit goods on social media websites are highlighted in the White House's *Joint Strategic Plan on Intellectual Property Enforcement* for fiscal years 2017–19:

- **Operation Watch**, which "identified the availability of over 30,000 individual images of counterfeit goods on one [unidentified] social media platform in just one day," and
- **Operation Jasper**, a wide-ranging U.K.-based initiative launched in 2015, which removed thousands of ads for counterfeit goods from Facebook alone.[165]

Instagram, which is owned by Facebook, is likewise popular with counterfeiters, although there is less data available regarding the platform. One study based on an analysis of site posts found that millions of accounts linked to counterfeit goods are active at any given time, and that counterfeit activity on the site grew by around 171 percent between 2016 and 2019.[166,*]

[*] The findings in this particular report are widely cited, but the methodologies used to reach them are unclear. These figures are cited here simply to relay what have become the dominant estimates in the field.

Social media platforms appeal to counterfeiters for a number of reasons. One is the ease of setting up new profiles/accounts, which is necessary as many are quickly shut down. There is also very little effective oversight—either at a governmental level or by the sites themselves. For instance, a report based on interviews with 22 Vietnam-based counterfeiters using social media quotes one seller as saying that Facebook pays little attention unless a large sum of money is reported in a complaint.[167]

Another benefit of social media is its ability to directly connect counterfeiters with buyers at limited risk. Rather than shipping large numbers of goods, sellers are able to use smaller packages, which are less likely to be confiscated by customs officers. For those using non-deceptive selling techniques, social media also offer them the ability to build rapport with customers, an important aspect that separates these channels from traditional e-commerce sites.[168]

Of course, social media platforms and e-commerce websites are often used in tandem to facilitate counterfeit sales, and to obscure the nature of the transactions. Ads on Facebook and Instagram, for example, can link consumers to outside pages with more information on the products themselves. A common progression, according to researchers, is that an ad is placed on Facebook or Instagram, the sale is handled via an encrypted chat service such as WhatsApp, and the money is transferred via an online tool like PayPal.[169] Facebook itself facilitates this process by allowing ads to open directly to messages in WhatsApp, which it also owns.[170] Twitter, which does not have a direct-buy option, primarily acts as an advertising space that links consumers to sellers.

In connecting buyers and counterfeiters, these sites are increasing consumers' risk of purchasing fraudulent items. One particular example is Facebook Marketplace, which allows users to post items for sale with little oversight. Instagram—the focus of much research given its large user base and low regulation—has also introduced a system allowing users to purchase items directly through its app.[171]

Along with these connections, counterfeiters take advantage of certain built-in tools to enhance the "legitimacy" of their pages, particularly on Facebook. These sellers can build "trust" by filling their pages with comments, likes, and friends (which can all be purchased) to bolster a consumer's sense that it can be trusted.[172] It is also possible to set up automated accounts, or "bots," to independently post comments; according to Ghost Data Analytics, millions of bot accounts were likely active on Instagram in 2016.[173]

It is important to note, however, that buyers active in the online counterfeit space have similar motivations to those in the offline market, and that social media platforms provide opportunities for sellers to appeal to those wanting to purchase counterfeit products, as well as those unaware they are doing so. In particular, social media enable sellers to create illusions of being legitimate

businesses, a fact that is true of both deceptive sellers, who rely on buyers mistaking their pages with the brands they are counterfeiting, and non-deceptive sellers, who merely need to appear trustworthy enough to provide products that function as advertised. According to the Better Business Bureau, the most common advertising tactic is using "copyrighted pictures of brand-name goods" to sell counterfeit products.[174] While this could indicate that online buyers are less interested in purposely buying counterfeit goods, it could also speak to the need for sellers to appear legitimate, in so far as their products look and function like their genuine counterparts.

8.2.2. Limited Field of Study

Although small in number, the studies analyzed for this section all reached similar conclusions. Namely, that despite lacking a standard method of operation, social media platforms are changing how the online counterfeit market functions, making it more adaptable, nimble, and difficult to monitor. Indeed, social media are often exacerbating existing complexities in the market itself.[175]

Researchers also agree that counterfeit sales facilitated by or made through these platforms are a significant problem that has not been adequately addressed. They further indicate that while there are few clear links between counterfeit operations on social media and rogue actors, namely terrorist organizations and transnational criminal networks, the potential exists for these platforms to be exploited as possible sources of funding. Given the ease of obscuring one's identity, it is difficult to rule out rogue actors utilizing social media to sell counterfeit items and equally difficult to prove they are doing so.

Overall, however, the original research in this area is often limited in scope, and there are few historical studies to contextualize the findings. Most academic research treats social media as a footnote for further study, in part due to the lack of established methodologies for studying it beyond anecdotal means; potential, rather than concrete, evidence is the norm. For example, in one report on the sale of fentanyl via Twitter, the authors note that their research is limited by what was available on the site at the time, due to the rapid shutdown and proliferation of accounts linked to pharmaceutical sales.[176] They also state that their findings "may only be the tip of the iceberg" due to links to larger networks, specifically forums like Google Groups, which allows users to communicate via email listservs and posts on members-only pages. Notably, methodologies that have not been effective in studying other aspects of the counterfeit market, such as direct contact with counterfeiters, are being used here. This suggests that future work on the topic of social media and counterfeiting could utilize a wide range of practices, avoiding some of the data collection problems experienced by previous researchers.

8.3. Most Relevant Studies

Reports were deemed relevant for this section if their findings focused on the role of social media in facilitating the purchase of counterfeit goods, rather than only on e-commerce platforms. Studies looking at rogue actors and their use of social media as a fundraising mechanism were also considered, though they are not listed in table 7 as the research was unable to provide any firm conclusions on this aspect of counterfeiting.

Table 7. Most Relevant Studies: Use of Social Media to Facilitate Counterfeit Trade

Title (Year)	Data Source(s)	Key Finding(s)
"Dark Motives—Counterfeit Selling Framework" (2018)	Interviews	The lack of regulation and the ease of relationship building are cited by counterfeiters as the aspects of social media that are most useful to them.
"Detection of Illicit Online Sales of Fentanyls via Twitter" (2017)	Data Collection and Analysis	In looking at the ways in which fentanyl is marketed via Twitter, it is clear that while the app is not really used for sales, it is a significant advertising platform.
Fakes are Not Fashionable (2019)	OECD Data, Surveys, and Self-Reports	Online sales of counterfeit goods are common, being addressed in a variety of ways, and impacting large numbers of people.
"Illicit Pharmaceutical Networks in Europe" (2017)	Data Collection and Analysis; Based on Two Other Reports	Individuals selling counterfeit pharmaceuticals in the Netherlands and U.K. use both online and offline methods to communicate and coordinate their efforts, showing that the markets are closely linked.
Instagram and Counterfeiting in 2019 (2019)	Data Collection and Analysis	Counterfeit activity on Instagram has grown by nearly 171 percent since 2016.
"Social Media and Luxury Goods Counterfeit" (2016)	Data Collection and Analysis	Much of the counterfeit activity on Instagram can be attributed to "bots" as there are significant numbers of the automated accounts active on the platform.

9. APPENDIX I: Article Summaries/Abstracts

For this report, the Federal Research Division (FRD) reviewed and analyzed articles and research studies published in scholarly journals and as government reports. Materials released by industry groups, nongovernmental organizations, and universities were also considered.

FRD conducted its primary search using ProQuest Central, finding 378 articles on counterfeiting in general. Additional studies were located by querying other databases and respected news sites. Of these sources, 74 were relevant to the topics described in this report. Some studies provided the research team with basic background information on counterfeiting as a whole, while others were more specific to individual areas of concern. The most relevant studies, and their key findings, are listed in the tables at the end of each topic summary. More general information about the 74 relevant studies is included here. For further details on the overall search methodology, see section 10, appendix II.

- *Addressing the Sale of Counterfeits on the Internet* (2017)

  For this publication, the International Trademark Association looked at current anti-counterfeiting efforts by search engines, online marketplaces, payment service providers, and trademark owners, among others, to update a 2009 report on voluntary best practices for internet-related companies. To update its recommendations, the association focused on practical ways these entities can cooperate in addressing the problem of counterfeiting. These recommendations include working with search engines and domain registries to follow recognized best practices and enforce policies and terms of service concerning intellectual property rights.

- *Annual Survey Study of Product Counterfeiting by Michigan Residents Utilizing the State of the State Survey: Update 2011-2012-2013; A Survey of Attitudes toward Product Counterfeiting, Related Law Enforcement Priority Setting, and Internet Medicines Purchasing Behaviors* (2013)

  This study is based on the findings of select questions from the 2011, 2012, and 2013 "State of the State" surveys in Michigan, which sampled approximately 1,000 residents each year. A related counterfeiting supplement addressed three main themes: consumer attitudes toward product counterfeiting, law enforcement priority-setting, and online purchases of prescription medicines.

- "Assessing the Developing Knowledge-Base of Product Counterfeiting: A Content Analysis of Four Decades of Research" (2017)

  To provide a qualitative review of the research on product counterfeiting, researchers at Michigan State University and the Citadel analyzed over 40 articles published between 1988 and 2014. They found that while progress has been made, the research field remains at a preliminary stage, with little depth and infrequent publications. The authors also cite a number of issues concerning the study of counterfeit markets, including a lack of universal definitions and insufficient data sources.

- "Avoiding Preventable Deaths: The Scourge of Counterfeit Rabies Vaccines" (2019)

  This article, written by 13 researchers in England, discusses the implications of ineffective rabies vaccines—an issue that can be linked to the spread of counterfeit vaccines more generally. In 2015,

for example, counterfeit medicines worth an estimated $79 billion were seized in over 115 countries. The article's authors suggest that investigating vaccine costs and global wages could highlight the populations most at risk of being targeted with cheaper, counterfeit human rabies vaccines. Proposed suggestions to combat this illegal activity include blockchain technology and testing prior to the vaccines being placed on the market.

- "A Challenge for Healthcare but Just Another Opportunity for Illegitimate Online Sellers: Dubious Market of Shortage Oncology Drugs" (2018)

  This study by researchers at the University of Pécs in Hungary analyzes the online availability of scarce oncology drugs. A simulated patient internet search was conducted to test the accessibility of these drugs and the results were evaluated in accordance with legal operations, distribution, and patient safety requirements. The authors found that in 2014 and 2016, all antineoplastic agents (i.e., medicines that prevent, inhibit, or halt tumor development) were available online and required no prescription. Moreover, while the number of legitimate websites selling these drugs decreased from 112 to 98, the percentage of illegitimate third-party sellers (none of which were accredited by online pharmacy verification databases) rose from 66 percent to 81 percent. To better combat this illegal trade, the researchers recommend updating the online verification databases, as well as reviewing and strengthening procurement and medication-use policies.

- "A Comprehensive Framework for Counterfeit Defect Coverage Analysis and Detection Assessment" (2014)

  With this study, researchers at Honeywell and the University of Connecticut sought to address a gap in the evaluation of available avoidance and detection techniques for counterfeit electronic components in supply chains. The authors note that although standards and programs are being implemented, uniformity in the test results is lacking. In fact, they state that no metrics currently exist to evaluate counterfeit detection methods. As a result, they developed a detailed taxonomy of defects, which they then used to create a comprehensive framework for identifying an optimum set of detection methods, taking into consideration test time, test cost, and application risks. The researchers found that the majority of electrical defects can be detected by the top two test methods—low-power visual inspection and electron-scanning microscopy.

- *Core Criteria for Effective Digital Advertising Assurance* (2015)

  The Trustworthy Accountability Group, a cross-industry program, published this document to establish a framework for identifying digital advertising assurance providers. These companies help advertisers, advertising agencies and networks, trading platforms, and related entities avoid having their advertisements appear on websites associated with the dissemination of counterfeit goods. The framework identifies criteria these assurance providers should meet, such as identifying risky entities and detecting, preventing, and disrupting fraudulent/deceptive transactions, as well as the validation process for meeting said criteria.

- "Counterfeit Drugs: A Growing Global Threat" (2012)

  This article—published anonymously in the *Lancet*—discusses the complexities surrounding counterfeit drugs and emphasizes that action must be taken as the problem is reaching global proportions. It asserts that the threats posed by such medications are diverse, as are the solutions, which require the cooperation of interested constituencies, particularly medical professionals, drug companies, government regulators, and judicial entities.

- "Counterfeit Drugs as a Common Risk for the Successful Treatment [*sic*]" (2017)

  Written by researchers in Serbia, this journal article also provides insight to the issue of counterfeit drugs. The authors note that 1 percent of the medicines available in the developed world may be counterfeit, while globally the percentage increases to 10 percent; it may even be as high as 50 percent in certain developing countries and on the internet. The importance of health professionals reporting any suspicious products and considering counterfeit drugs as potential causes of adverse reactions or ineffective treatments is also emphasized.

- "Counterfeit Goods and the Public's Health and Safety" (2003)

  This report, prepared by a researcher at the nonprofit International Intellectual Property Institute, discusses counterfeiting and its economic, financial, and medical consequences. It claims to be the first report to articulate the health and safety concerns of counterfeiting, as prior studies contain anecdotal stories claiming there are no such impacts. Issues related to limited data sources are recognized and recommendations are suggested, such as changing policies, enforcing public health and safety regulations, and increasing collaborations among constituencies.

- "Counterfeit Goods are a $460 Billion Industry, and Most are Bought and Sold Online" (2017)

  This magazine article highlights how Red Points, a brand protection firm in Barcelona, Spain, has used web crawlers to identify sites that sell counterfeit goods. Red Points' custom-built algorithms scour online platforms for fake merchandise on behalf of its clients (i.e., rights holders). Its findings reflect the places where the most counterfeit products are found, but only as they relate to the company's 200 clients, who are not identified.

- "Counterfeit Integrated Circuits: Detection, Avoidance, and the Challenges Ahead" (2014)

  The same Honeywell and University of Connecticut researchers who sought to address a gap in the evaluation of available avoidance and detection techniques for counterfeit electronic components sought to do the same for integrated circuits. In this paper, they provide a detailed overview of the defects that can be found in such circuits, as well as the methods for detecting said defects. The authors then provide descriptions of the implementation challenges associated with these methods and highlight possible countermeasures, considering the effectiveness and limitations of various techniques.

- "Counterfeit Luxury Goods Purchase Motivation: A Cultural Comparison" (2015)

  Conducted by researchers at Missouri State University, this study compares the attitudes toward counterfeit apparel of college-age consumers in the United States and China. The results suggest that American consumers are more inclined to purchase, consume, and reveal the truth about counterfeit products than their Chinese counterparts. When it comes to luxury brands, the authors note that non-deceptive counterfeiting techniques are prevalent, but do not offer an estimate of the ratio of deceptive to non-deceptive purchases. They also observe that as manufacturers have increasingly outsourced their production to Asia in an effort to reduce costs, some contractors have added third shifts (also known as "ghost shifts") to overproduce luxury goods that can then be sold "out the back door."

- "Dark Motives—Counterfeit Selling Framework: An Investigate [*sic*] on the Supply Side of the Non-Deceptive Market" (2018)

  The authors of this study interviewed 22 counterfeit sellers in Vietnam to gather data and anecdotal information about the ways in which they use social media as sales platforms. They document the personality traits common to those selling counterfeit goods online, the motivations used to justify these sales, and the benefits the sellers see, particularly the ways in which social media provide low-risk, high-reward opportunities. Additionally, the authors found that in some cases, the individuals using social media also operate storefronts, demonstrating the link between offline and online sales.

- "Defining the Public Health Threat of Food Fraud" (2011)

  This study, written by two researchers at Michigan State University, is intended to act as a reference guide on the topic of food fraud. It emphasizes the importance of preventing incidents related to such fraud, rather than intervening once they occur. The report also highlights the need for a public–private partnership approach to address the public health risks associated with these incidents. The authors' most important finding is that current intervention methods are ill-equipped to detect unexpected contaminants.

- "Defining the Types of Counterfeiters, Counterfeiting, and Offender Organizations" (2013)

  For this report, another group of researchers at Michigan State University used existing studies in criminology, behavioral and packaging science, economics, and business and supply chain management to create a typology defining various kinds of counterfeiters, counterfeiting strategies, and organizational hierarchies. The authors drew from a number of criminological profiles, making clear the many differences between types of counterfeiters and their operations, motivations, and intentions. Their findings suggest that understanding these offenders and their organizations is essential to predicting which countermeasures (e.g., forensic packaging measures and supply chain modifications) might deter them from future counterfeiting productions.

- "Detection of Illicit Online Sales of Fentanyls via Twitter" (2017)

  Written by two professors at the University of San Diego, this report focuses on sales of the synthetic opioid fentanyl on Twitter. Gathering and analyzing five months of data using the hashtag filter "fentanyl," the authors found over 700 tweets tagged to fentanyl during that time. While only nine tweets included direct links to websites selling the drug, the research highlights the interconnected nature of social media platforms and the larger e-commerce marketplace, as well as the ways in which one particular network can be used to sell goods indirectly to consumers.

- "Direct Analysis of Pharmaceutical Drugs Using Nano-DESI MS" (2016)

  Two chemistry professors at Sweden's Uppsala University tested a new technique for detecting counterfeit medications. They analyzed the molecules in 14 different brands of tablets containing four kinds of active pharmaceutical ingredients (APIs)—acetaminophen and ibuprofen (both fever reducers and pain relievers), and sildenafil and tadalafil (two treatments for erectile dysfunction). Their analysis used nanospray desorption electrospray ionization mass spectrometry, or nano-DESI MS. The technique detected both APIs and inactive ingredients in all of the analyzed tablets. The researchers also used principal component analysis to score the samples. Based on their results, the authors suggest this combination method could be a powerful tool to distinguish legitimate medications from counterfeit and falsified drugs.

- "Discovering Product Counterfeits in Online Shops: A Big Data Integration Challenge" (2014)

  In this article, a computer scientist at the University of Leipzig focuses on theoretical approaches to combating online counterfeiting. He argues in favor of a solution that involves a wide variety and volume of data. Due to the massive amount of counterfeit products sold online, seeking these goods is not a process that can be done manually. As a result, any solution will require ways to automatically identify websites offering potential counterfeits for certain products, as well as site-specific approaches to finding and removing all offers for these goods.

- "The E-Commerce Market for 'Lemons': Identification and Analysis of Websites Selling Counterfeit Goods" (2015)

  Three cybersecurity researchers conducted this study to identify online counterfeiters of 25 different brands. "Innocent," "grey," and "complicit" keywords (e.g., "buy online," "cheap," and "knockoff," respectively) were paired with each brand name in a Google search. The researchers then built a logistic regression model on a set of URL-, page-, and website-level features, such as domain names, webmail addresses, and site registrations. Their model detected counterfeit websites within the top 100 search results for each brand with 85 percent accuracy.

- *The Economic Impact of Counterfeiting* (1998)

  This report, prepared for the Industry Division within the Organisation for Economic Co-operation and Development's Directorate for Science, Technology, and Industry—now the Directorate for Science, Technology, and Innovation—provides a comprehensive overview of the consequences of counterfeiting. It highlights the widespread nature of counterfeiting, both in terms of industries impacted and geographic scope. Statistics on legitimate and counterfeit sales are also provided. The report proposes a number of different policy initiatives and provides contact information for the organizations working to combat the issue.

- *The Economic Impacts of Counterfeiting and Piracy* (2017)

  Microeconomics consulting firm Frontier Economics was commissioned to write this report by BASCAP (Business Action to Stop Counterfeiting and Piracy, a part of the International Chamber of Commerce) and the International Trademark Association. The researchers examined estimates of the size and scope of the counterfeit market, extrapolating those findings to forecast the potential growth in international trade to around $991 billion by 2022. They also estimated the size of the domestic counterfeit market, which their model places at $524 billion–$959 billion by 2022.

- "Elixirs of Death" (2013)

  This article, written by a science journalist in Germany, discusses the financial strain on healthcare systems caused by falsified and substandard medicines. Various examples of major public health crises due to these medications are provided, along with suggestions to combat the growing issue. The author notes that it is imperative to invest in the integrity of drugs—both as a human rights issue and as an economic one—since illicit drugs may give rise to antibiotic resistance, resulting in more ineffective medicines and causing further harm to patients.

- "An Empirical Examination of Product Counterfeiting Crime Impacting the U.S. Military" (2017)

  Compiled by two Michigan State University researchers, this paper highlights open-source data on counterfeit products in the defense supply chain to illustrate the risks associated with such parts.

The university's Product Counterfeiting Database (managed by the Center for Anti-Counterfeiting and Product Protection) was utilized to identify each method of entry into the supply chain, as well as the method's characteristics, offenders, and victims.

- "The Face of Fakes: U.S. Consumers and Counterfeit Fashion Products" (2014)

  Surveying a sample of some 300 consumers, this study by researchers in the University of South Carolina's Department of Retailing investigates consumer attitudes toward the intentional purchase of counterfeit fashion products. Its findings suggest that gender and education level are the two variables most frequently related to the intentions, beliefs, and perceived ethics of buying such goods. Female respondents, for example, were more likely to hold positive beliefs about counterfeit fashion products, as well as greater purchase intentions, than male respondents. Education level was also a significant predictor of purchase intention, suggesting that more educated consumers may be very resistant to buying counterfeits.

- "Fake and Pirated: Do Consumers Care?" (2017)

  The main objective of this multinational study is to understand global consumer perceptions of anti-counterfeiting campaigns. Specifically, it examines the perceived effectiveness of five different approaches commonly used by governments and industry groups to discourage intentional counterfeit purchases: anti-counterfeiting role models (e.g., Taylor Swift denouncing Apple's free music trials, which did not initially pay royalties), education, fear of legal prosecution, highlighting counterfeiting networks' links to organized crime, and peer pressure. The researchers administered a web survey to 1,786 consumers in Brazil, China, India, Russia, and the United States. The results for the U.S. respondents show that they find all tactics but "anti-counterfeiting role models" (though Swift is an exception) to be "somewhat effective" deterrents to making counterfeit purchases.

- *Fakes are Not Fashionable: A BBB Study of the Epidemic of Counterfeit Goods Sold Online* (2019)

  This pamphlet, written by an international investigations specialist with the Better Business Bureau (BBB), centers on counterfeit sales made using online platforms, including social media networks such as Facebook and e-commerce sites like Amazon. The author uses published qualitative and quantitative studies, as well as anecdotal case studies and statistics collected by the BBB, to craft a comprehensive overview of the online counterfeit market. He makes clear that the online space is particularly appealing to counterfeiters, and that many platforms are failing to properly address this growing marketplace.

- "The Fake vs Real Goods Problem: Microscopy and Machine Learning to the Rescue" (2017)

  Four researchers affiliated with the New York City-based luxury handbag authentication startup Entrupy developed a microscopic imaging tool that can distinguish between authentic goods and counterfeit products with 98 percent accuracy. Their system was tested using a dataset of 3 million images that included a variety of materials (e.g., fabrics and leather) and objects (e.g., electronics, pills, shoes, and toys).

- *Focus On: The Illicit Trafficking of Counterfeit Goods and Transnational Organized Crime* (2014)

  Prepared by the U.N. Office on Drugs and Crime, this report highlights the issue of counterfeiting, as well as the actions being taken to combat it. Counterfeiting is shown to spare no industry, from personal care products, pharmaceuticals, and kitchenware to automotive/aviation parts, electronics,

and defense equipment. It highlights the international nature of the crime's effects, including numerous social, ethical, financial, and health impacts—impacts such as labor exploitation, loss of revenue, and severe threats to public health and safety.

- *Gen Z Insights: Brands and Counterfeit Products* (2019)

  This study, commissioned by the International Trademark Association, explores the attitudes and purchasing behaviors toward counterfeit goods of "Gen Zers"—defined as persons 18–23 years of age. While the overall research effort covers 10 countries (Argentina, China, India, Indonesia, Italy, Japan, Mexico, Nigeria, Russia, and the United States), this report breaks out the findings for the U.S. sample of 1,250 respondents. Seventy-one percent of the respondents (888) reported having purchased counterfeit products in the past year, although there was no specification as to whether those goods were bought knowingly or unknowingly.

- "The Health and Economic Effects of Counterfeit Drugs" (2014)

  This review, prepared by researchers at Temple and Widener Universities in Pennsylvania, as well as the president of the American Consumer Institute, focuses on the health and economic effects of counterfeit drugs in the United States. Counterfeit medications constitute a significant portion of the U.S. drug market and that percentage is continuing to rise, especially with the introduction of online pharmacies. The authors state that in addition to creating threats to public health, counterfeit drugs can waste consumer income and negatively impact innovation. To combat these issues, they recommend, among other things, strengthening state licensure supervisions and using radio frequency identification devices for legitimate medications.

- *Hearing on Counterfeits and their Impact on Consumer Health and Safety, Before the Committee on the Judiciary* (2016)

  This hearing document is a compilation of member statements, witness statements, and written responses to "Questions for the Record." Taken together, the files assert that the manufacturing and sale of counterfeit goods is a global issue with significant impacts on the U.S. economy and public health and safety. Particularly dangerous counterfeits, such as counterfeit pharmaceuticals, electronics, automotive/aviation parts, and defense equipment, place consumers at risk of harm, injury, or death. Recommendations and opportunities for improvement, including encouraging the e-commerce industry to remove listings for counterfeit goods, are suggested.

- "Illicit Pharmaceutical Networks in Europe: Organizing the Illicit Medicine Market in the United Kingdom and the Netherlands" (2017)

  This article uses two separate reports on the Netherlands and United Kingdom to study the global illicit pharmaceutical supply chain. It finds that the networks facilitating the sales of illicit drugs are flexible and ever-changing, and that there is a great deal of interplay between offline and online strategies. The authors highlight the complex relationships between individual sellers and larger criminal networks, along with the ways in which digital and physical tactics can be paired to market, sell, and deliver counterfeit medicines.

- *Illicit Trade: Converging Criminal Networks* (2016)

  This report by the Organisation for Economic Co-operation and Development (OECD) covers a wide range of illicit markets, using different data sources and methodologies for each market studied

(e.g., seizure rates based on U.N. data for counterfeit tobacco and World Customs Organization figures for counterfeit medicines). It notes that the trade routes used for illicit goods often overlap, and that the same criminal networks involved in one illicit market can be equally involved in another. This links counterfeit goods to human trafficking and other illicit funding sources, and highlights the ways in which counterfeiting is part of a larger ecosystem of illicit trade.

- *Instagram and Counterfeiting in 2019: New Features, Old Problems* (2019)

  In this update to the 2016 report "Social Media and Luxury Goods Counterfeit" (listed later in this section), researchers with Ghost Data Analytics find that the issues previously highlighted have been exacerbated by a number of new features introduced by Facebook on Instagram. This includes "Stories"—temporary public videos that can be used to advertise goods—and the option to buy products directly through the app itself.

- *Intellectual Property: Agencies Can Improve Efforts to Address Risks Posed by Changing Counterfeits Market* (2018)

  Written by the U.S. Government Accountability Office (GAO), this report discusses how government agencies can better combat the risks posed by counterfeit goods. Reviewing data from both U.S. Customs and Border Protection and U.S. Immigration and Customs Enforcement, it highlights the number of counterfeit goods entering the United States, the results of improved collaboration and enforcement, and the ways in which the private sector is involved. In particular, the GAO found that e-commerce has prompted a shift in counterfeit trade, as consumers increasingly purchase goods online and counterfeiters sell a wider variety of items alongside authentic products.

- *Intellectual Property Rights: Fiscal Year 2012–18 Seizure Statistics* (2013–19)

  Since at least 2013, U.S. Customs and Border Protection has published an annual report on counterfeit products seized at U.S. ports of entry. These documents highlight a variety of data, including the types, numbers, and values of goods seized; their regions of origin; the shipping and transportation methods used; the importers who have been arrested and sentenced; and related health, safety, and security concerns. Reviewed together, these files provide a snapshot of the United States' share of the international counterfeit market.

- *Intellectual Property Rights Violations: A Report on Threats to United States Interests at Home and Abroad* (2011)

  This report, prepared by the National Intellectual Property Rights Coordination Center, focuses on criminal intellectual property theft violations and the global threat they pose to U.S. interests. Its findings—which highlight content piracy and counterfeit aviation parts, electronics, luxury goods, and pharmaceuticals—are based on interviews with 126 intellectual property rights experts from various academic organizations, industries, and government agencies.

- "Internet Payment Blockades" (2016)

  In this study, a legal professor at the University of Idaho discusses internet payment blockades, which are a way to enforce intellectual property rights by attempting to interrupt the flow of money to online merchants who profit from counterfeiting. She explores voluntary best practices in this space, including notice and takedown procedures.

- "An Introduction to the Special Issue on 'Counterfeiting'" (2017)

  This introduction, written by researchers at the United Kingdom's Teesside University, is part of a special issue of *Trends in Organized Crime* that gathers empirical research and theoretical accounts on counterfeit trade across multiple industries. Five peer-reviewed articles and two report excerpts are included. The authors discuss the economic, health, and safety risks of counterfeit products, as well as factors that incentivize counterfeiting and directions for future research.

- *The IP Commission Report: The Report of the Commission on the Theft of American Intellectual Property* (2013); *Update to the IP Commission Report: The Theft of American Intellectual Property; Reassessments of the Challenge and United States Policy* (2017)

  In 2012, the Commission on the Theft of American Intellectual Property was charged, in part, with documenting and assessing the causes and scale of U.S. intellectual property theft. A year later, the commission published its findings, noting that such theft results in annual losses of hundreds of billions of dollars and millions of jobs. Intellectual property theft also creates a drag on economic growth and diminishes incentives to pursue innovation. An update to the report was published in 2017, providing a new assessment of the problem, as well as progress information on some of its recommendations.

- "Learning to Detect and Measure Fake E-Commerce Websites in Search Engine Results" (2017)

  Two Italian researchers conducted this study to identify online counterfeiters of 39 different shoe brands. Three search engines were queried, using "neutral," "biased," and "complicit" keywords that included modifiers such as "shoes," "cheap," and "replica." Features of product websites deemed to be counterfeit indicators were divided into four categories: product navigation and search, product display, purchase management, and customer service information. Using a training dataset that was manually labeled by two outside experts, an algorithm was designed to review the results. This classifier had an accuracy of 91 percent, with most errors being false positives.

- *Mapping the Real Routes of Trade in Fake Goods* (2017)

  In this study, one of many written by the OECD and EUIPO (European Union Intellectual Property Office), researchers map the travel routes of counterfeit products in 10 key industrial sectors. They differentiate between regions of origin and transit hubs, illuminating the destination-dependent paths along which the goods flow. The authors also discuss the challenges of studying these routes, including the fact that transit hubs can be used to obscure the goods' original starting locations.

- *Measuring IPR Infringements in the Internal Market: Development of a New Approach to Estimating the Impact of Infringements on Sales* (2012)

  To conduct this work, researchers affiliated with the RAND Corporation's European office designed a method using sales forecasts and actual sales to estimate the economic impact of counterfeit goods. The authors note that measuring this impact is difficult, as it is hard to ascertain which portion of lost sales can be attributed specifically to intellectual property rights infringement. Their method also resulted in totals not in line with other available estimates, which the authors do highlight in the text.

- *Measuring the Magnitude of Global Counterfeiting: Creation of a Contemporary Global Measure of Physical Counterfeiting* (2016)

  Compiled by the U.S. Chamber of Commerce's Global Intellectual Property Center, this report highlights the challenges in measuring the scope of the counterfeit market, while also assessing the available estimates of its size. Additionally, the center uses a method designed in-house to calculate the shares of counterfeit production for 38 countries, intending to fill the knowledge gap related to goods originating from places other than China and Hong Kong. It also incorporates seizure data from the European Union, Japan, and the United States to determine which countries export the most counterfeit goods to each of the three recipients.

- "'Measuring the Unmeasurable': Approaches to Assessing the Nature and Extent of Product Counterfeiting" (2016)

  This paper, written by three researchers affiliated with Michigan State University and Tarleton State University in Texas, examines the current approaches used to quantify product counterfeiting, the methods used to study unrelated crimes, and various other research methodologies. Data sources include articles, studies, and papers from myriad authors and organizations. The researchers note that there is no ideal method to measure product counterfeiting, as a lack of access to counterfeiters and rapid changes in the marketplace make developing an effective process particularly difficult.

- "Men and High-Earners are More Likely to Buy Counterfeit Goods" (2019)

  This short article summarizes the findings of a survey conducted by the Pittsburgh-based marketing research firm CivicScience on adult consumers' attitudes toward legal "knock-offs" (e.g., shoes that happen to look like Birkenstocks) and illegal counterfeit goods (e.g., shoes that are passed off as Birkenstocks), as well as their past purchases of such items. The survey of nearly 1,700 adults living in the United States found that more than 60 percent of the respondents were very or at least somewhat concerned about fake or counterfeit products, while nearly 40 percent were not. Twenty-two percent of the respondents also reported that they had either knowingly or unknowingly purchased counterfeit goods in the past; another 19 percent said they were unsure if they had made such purchases.

- *Misuse of Small Parcels for Trade in Counterfeit Goods* (2018)

  This report on counterfeit trade via small parcels, written by the OECD and EUIPO, is particularly focused on the European Union. However, it does highlight commonly used postal and express shipping methods for counterfeits, international policies concerning small parcels, and evidence of the international scope of the counterfeit market, providing a more complete, though still general, picture of the issue.

- "Multiscale Approach to the Security of Hardware Supply Chains for Energy Systems" (2013)

  In this study, a team of academics at the Universities of Virginia and Massachusetts and researchers affiliated with the U.S. Army Engineer Research and Development Center in Vicksburg, Mississippi, advocate using a multiscale approach to secure supply chains against counterfeiting and other threats. They look specifically at semiconductors and other electronic devices that support energy systems and smart grids. This approach uses both qualitative and quantitative factors tailored to a range of stakeholders, geographic scales, organizational levels, and planning/operational timelines.

- "Oncology Drugs in the Crosshairs of Pharmaceutical Crime" (2018)

  This journal article, written by four European researchers, discusses oncology drugs as targets of pharmaceutical crimes, including, but not limited to, counterfeiting. Although the researchers found that oncology medicines ranked fifth on a list of commonly falsified drugs, it is difficult to identify the use of such drugs in clinical practices as they can be ineffective, symptoms can go undetected, and patients can be willing to purchase medications from unverified sources—thus, the prevalence of these medicines may be higher than recorded. The authors recommend mandating the use of anti-tampering devices, product verification technologies, and reporting of ineffective/unexpected drug effects to prevent falsified oncology drugs from entering clinical practice and causing potential harm to patients.

- *Online Barometer: Global Shopping Surveys* (2014, 2016–18)

  These reports, published by San Francisco-based Clarivate Analytics' MarkMonitor brand protection firm, highlight consumers' experiences with online counterfeiting. Based on surveys of consumers from around the world, namely those living in France, Germany, Italy, the United Kingdom, and the United States, the reports address various purchasing behaviors. The files summarizing the 2014 and 2015 studies are of particular interest as the U.S. results are described separately from the rest of the data.

- "Organizing for Brand Protection and Responding to Product Counterfeit Risk: An Analysis of Global Firms" (2016)

  Three researchers affiliated with Michigan State University's Center for Anti-Counterfeiting and Product Protection (A-CAPP) interviewed representatives from 10 large global firms to learn more about how they protect their brands and measure incidences of counterfeiting, as well as how they perceive the success of those efforts. The authors found that most firms use multiple measures to assess the prevalence and impacts of counterfeiting. They also note that successful firms share three main characteristics: management support, adequate funding, and an overall understanding of counterfeiting and its associated problems.

- *Pharmaceutical Counterfeiting: Endangering Public Health, Society, and the Economy* (2018)

  This report, published by the Fraser Institute in Vancouver, Canada, discusses low-quality medicines (including substandard, spurious, falsely labeled, falsified, and counterfeit medical products) in international commerce. It states that drug shortages, poor regulatory measures, and a lack of criminal sanctions have contributed to the worldwide spread of counterfeit pharmaceuticals. Recommendations for combating this issue include raising public awareness, improving regulatory oversight, incentivizing domestic production, and better regulating international shipments.

- "The Primacy of Public Health Considerations in Defining Poor Quality Medicines" (2011)

  Written by researchers from Australia, Ghana, Kenya, Norway, Sweden, the United Kingdom, and the United States, this article emphasizes the growing importance of both defining and combating the issue of counterfeit medicines. It also highlights interventions aimed at improving drug quality in developing countries and the intersections these initiatives have with public health concerns and commercial interests.

- "Product Counterfeiting at the State Level: An Empirical Examination of Michigan-Related Incidents" (2012)

  For this study, two A-CAPP researchers used arrest records, court records, and other public documents to conduct an empirical review of counterfeit cases related to Michigan. Their searches revealed that the state is involved in both local and global cases, including some with links to terrorism. Their work also illustrated certain gaps in the literature, particularly the absence of studies on domestic counterfeiting. The authors created evidence-based policy lessons to stir additional discussions on this issue and to suggest directions for future research.

- "Protecting the U.S. Medicine Supply: Integrating Approaches to Promote Safety" (2013)

  This paper—written by the former vice president and chief security officer of Pfizer—discusses the growing concerns raised by the existence of substandard, adulterated, and counterfeit medicines in the U.S. pharmaceutical market. Although considered the "gold standard" when strict regulation is enforced, the U.S. drug supply is now being contaminated with tainted medicines. Government reports, scholarly articles, and other data sources are analyzed to determine the scope of the problem and provide recommendations to combat it. To restore the drug supply's integrity, the author suggests a holistic approach that includes advanced technology, stakeholder awareness, regulatory enforcement, and a sustained policy commitment to patient safety and health.

- "Research Report on Consumer Attitudes and Perceptions on Counterfeiting and Piracy" (2010)

  Sponsored by BASCAP, this report summarizes the most important insights and conclusions from an 18-month investigation of consumer attitudes toward counterfeit goods. In total, the author analyzed 176 consumer perception studies and 202 consumer awareness campaigns from some 40 countries. He also collected data from consumers in India, Mexico, Russia, South Korea, and the United Kingdom. On average, 80 percent of the consumers surveyed reported having purchased some kind of counterfeit or pirated product at least once.

- "Responding to the Hidden Threat: How Luxury Brands are Fighting Back Against Counterfeiting" (2014)

  The authors of this article note that while luxury associations are starting to develop alliances, they have yet to adopt a unified approach to combat counterfeiting. Although it is not possible to develop a single blueprint that can be applied to every company, the authors recommend that rights holders tailor their strategies by clarifying the scope and scale of the problem—taking into account target markets, the types of counterfeits being produced, and how those counterfeits are being manufactured, distributed, and sold. With this information, brands can combine elements of intellectual property protection, supply chain management, and export, customs, and retail market controls.

- "A Review of the Economic Impact of Counterfeiting and Piracy Methodologies and Assessment of Currently Utilized Estimates" (2012)

  The goal of this study was to ascertain the veracity/quality of dominant estimates of the size of the international counterfeit market and the methodologies used to reach those figures. The authors found that the research in this area lacks rigor, primarily due to the use of unclear methodologies. They also note that there is no reliable quantitative process to study the size of the counterfeit market or its economic impact.

- "Rise in Online Pharmacies Sees Counterfeit Drugs Go Global" (2015)

  Written by an Australian journalist, this report also discusses substandard, spurious, falsely labeled, falsified, and counterfeit drugs. She notes that certain countries (e.g., Russia) have increased their production of such medications, whose presence in the global drug supply has only increased with the introduction of online pharmacies. The report also explains that medical professionals, as well as consumers, can be duped into purchasing counterfeit medications that appear to be legitimate. These counterfeit drugs can lead to antibiotic resistance and adverse reactions, including serious illnesses and death. As a result, healthcare systems are strained and experiencing increased costs.

- *Roles and Responsibilities of Intermediaries: Fighting Counterfeiting and Piracy in the Supply Chain* (2015)

  Four years ago, BASCAP published a lengthy document addressing the roles and responsibilities of certain online intermediaries, including websites, platforms, and portals; infrastructure providers; and search, advertising, and payment processors. While the report has a European perspective—discussing current issues, approaches, and impacts—it also presents lessons learned by rights holders and responsible intermediaries, and suggests several best practices for moving forward.

- "Seven Best Practices for Fighting Counterfeit Sales Online" (2017)

  MarkMonitor published this white paper to help rights holders address online counterfeit sales. The paper suggests that they adopt "their own proven best practices" to combat these sales at both promotional and distribution sites. It also points to technologies that can help rights holders identify and quantify online counterfeiting worldwide, and prioritize and address infringement. Additionally, it cites research related to the economic costs of counterfeiting and brand protection efforts.

- *Share and Share Alike: The Challenges from Social Media for Intellectual Property Rights* (2017)

  This report, commissioned by the U.K. Intellectual Property Office, assesses the role of social media in counterfeit sales, as well as the ways in which the online marketplace is changing counterfeit trade more broadly. Although the study's findings indicate that there is significant concern among stakeholders about the impacts of such platforms, they also show that the limited research makes it difficult to reach firm conclusions.

- "Social Media and Luxury Goods Counterfeit: A Growing Concern for Government, Industry and Consumers Worldwide" (2016)

  For this report, researchers with Ghost Data Analytics reviewed thousands of Instagram posts to estimate how often counterfeit luxury goods are promoted on the platform. To do so, they analyzed common features of "bots"—automated accounts that post independently—and determined that they publish millions of posts advertising fake products. They also found that these accounts use features such as the comments to encourage buyers to make purchases directly through the site.

- "Substandard and Counterfeit Medicines: A Systematic Review of the Literature" (2013)

  This study, conducted by three researchers at the University of Nottingham, is a systematic review of the literature on poor-quality pharmaceuticals, including substandard and counterfeit medicines. While the authors found no data regarding the prominence of low-quality medicines in upper-

middle- and high-income countries, they did see a widespread prevalence of these drugs in lower- and lower-middle income countries, particularly in Africa and Asia.

- *Supporting Innovation, Creativity, and Enterprise: Charting a Path Ahead; U.S. Joint Strategic Plan on Intellectual Property Enforcement, FY2017–2019* (2016)

  This report focuses on the international counterfeit market—including the role of social media and e-commerce in this space—and the threat it poses to U.S. interests. Produced by the Office of the U.S. Intellectual Property Enforcement Coordinator, the report discusses several studies assessing the market's overall size and scope. It also highlights the ways in which counterfeiters are adapting to new technologies, and advocates strengthening voluntary efforts by parts of the online market (e.g., advertising networks and payment processors) to curb the flow of illicit revenues associated with counterfeit trade.

- "Synchronizing Anti-Counterfeiting Efforts" (2017)

  This article, written by a pharmaceutical technology journalist, looks at the various technologies the pharmaceutical industry needs to use to meet certain U.S. and European regulations. It also provides insights on the economic impacts and costs of counterfeiting to the industry as a whole.

- "Systematic Review: Resilience Enablers to Combat Counterfeit Medicines" (2018)

  Conducted by Brazilian researchers, this study analyzes 84 papers published over the last 15 years, with a focus on the role that resilience enablers play in combating counterfeit pharmaceuticals. The authors identify and categorize 16 frequently mentioned anti-counterfeiting measures and find that six (engineering, collaboration, visibility, innovation, supply chain culture, and trust) are crucial in combating the sale of counterfeit medicines.

- "A Systematic Review of Counterfeit and Substandard Medicines in Field Quality Surveys" (2014)

  This study, organized by four researchers in the United Kingdom, discusses the growing threat of substandard and counterfeit medicines. The authors conclude that these drugs should be identified through chemical and physical analysis, source authentications, and package inspections. They also note that more research is needed on countries in Australia, the Middle East, the northern part of Africa, and the western part of Asia.

- *Trade in Counterfeit and Pirated Goods: Mapping the Economic Impact* (2016)

  Another OECD/EUIPO report, this study provides several quantitative estimates of the size of the international counterfeit market and its economic impact. To calculate these figures, the researchers used seizure data and trade statistics, as well as the OECD's General Trade-Related Index of Counterfeiting. According to the report, the market was estimated in 2013 to be around 3 percent of global trade, or around $461 billion.

- *Trade in Counterfeit Goods and Free Trade Zones* (2018)

  To understand the role of Free Trade Zones (FTZs) in counterfeit trade, researchers with the OECD and EUIPO charted their overall growth, as well as the legal frameworks that govern them. They examined the ways in which FTZs facilitate counterfeit trade and the conditions within these zones that enable this trade to flourish, finding that FTZs in countries with lower levels of intellectual

property-related regulation and higher levels of corruption are more likely to become hotbeds of counterfeit activity.

- *Trends in Trade in Counterfeit and Pirated Goods* (2019)

  This OECD/EUIPO report acts in part as an update to the 2016 study, *Trade in Counterfeit and Pirated Goods*. The researchers used that report's data to chart the most effected industries, identify the main regions of origin, and highlight the countries most impacted. They also found that the international counterfeit market has grown to account for around 3 percent of global trade, or around $509 billion.

- "Who are the Guardians in Product Counterfeiting? A Theoretical Application of Routine Activities Theory" (2014)

  Two researchers at the University of Michigan published this article applying criminological theory to product counterfeiting, which they consider a gap in the literature. Specifically, the authors apply the theory of "guardianship" to the study of such counterfeiting and follow up with implications for prevention and policy. This theory suggests that the presence of a capable guardian will lessen the likelihood someone will commit a crime.

- *Why Do Countries Export Fakes? The Role of Governance Frameworks, Enforcement, and Socio-Economic Factors* (2018)

  This 20-page pamphlet by the OECD looks at various factors that correlate to higher propensities for exporting counterfeit goods. It identifies key characteristics that can contribute to a country serving as such a hub—covering governance, the presence of FTZs, production facilities, logistics capacities, and trade policies. Of these components, a high level of corruption and poor intellectual property protections are the most indicative of potential counterfeit activity.

10. APPENDIX II: Search Methodology

To identify the existing and emerging research on U.S. intellectual property and counterfeit goods, the Federal Research Division (FRD) conducted keyword searches in a variety of databases and search engines. As noted, an initial query in ProQuest Central captured 378 articles related to counterfeiting in general. Those articles were then evaluated by each researcher to determine their relevancy to the individual areas of concern:

- Overall magnitude of counterfeit markets,
- Impacts of counterfeit goods on the U.S. economy,
- Role of the private sector in limiting exploitations,
- Trends in counterfeit trade via small parcels,
- Risks of counterfeit goods to public health and safety,
- Trends in consumer attitudes toward counterfeit goods, and
- Use of social media to facilitate counterfeit trade.

Additional sources were pulled from libraries for the Association for Computing Machinery, the Institute of Electrical and Electronics Engineers, and the Organisation for Economic Co-operation and Development. Specialized databases, including EBSCO Business Source Complete, Google Scholar, HeinOnline, PubMed Central, ResearchGate, and the Social Science Research Network, were also used.

Keyword searches consisted of Boolean search strings that included the use of wild cards and modifiers like quotation marks for specific phrases. For this report, FRD combined "counterfeit*" with different terms for each section in an effort to identify as many relevant articles as possible.

11. REFERENCES

[1] U.S. Patent and Trademark Office, "About Us," last modified October 8, 2019, https://www.uspto.gov/about-us.
[2] Wade Shepard, "Meet the Man Fighting America's Trade War against Chinese Counterfeits (It's Not Trump)," *Forbes*, March 29, 2018, https://www.forbes.com/sites/wadeshepard/2018/03/29/meet-the-man-fighting-americas-trade-war-against-chinese-counterfeits/#db934f51c0d6; Roberto Fontana, Stéphane J.G. Girod, and Martin Králik, "How Luxury Brands Can Beat Counterfeits," *Harvard Business Review*, May 24, 2019, https://hbr.org/2019/05/how-luxury-brands-can-beat-counterfeiters.
[3] Shepard, "Meet the Man."
[4] Organisation for Economic Co-operation and Development (OECD) and European Union Intellectual Property Office (EUIPO), *Trade in Counterfeit and Pirated Goods: Mapping the Economic Impact* (Paris: OECD Publishing, 2016), 68, doi: 10.1787/9789264252653-en; OECD and EUIPO, *Trends in Trade in Counterfeit and Pirated Goods* (Paris: OECD Publishing, 2019), 45, doi: 10.1787/g2g9f533-en.
[5] OECD and EUIPO, *Trade in Counterfeit and Pirated Goods*, 68.
[6] Frontier Economics, *The Economic Impacts of Counterfeiting and Piracy* (New York: International Trademark Association [INTA], 2017), 22, https://www.inta.org/Communications/Documents/2017_Frontier_Report.pdf.
[7] OECD and EUIPO, *Trade in Counterfeit and Pirated Goods*, 11, 68; World Bank, "World Development Indicators: Gross Domestic Product 2018," last updated September 19, 2019, https://datacatalog.worldbank.org/dataset/gdp-ranking.
[8] OECD and EUIPO, *Mapping the Real Routes of Trade in Fake Goods* (Paris: OECD Publishing, 2017), 17, doi: 10.1787/9789264278349-en; OECD and EUIPO, *Trade in Counterfeit and Pirated Goods*, 51.
[9] Frontier Economics, *The Economic Impacts of Counterfeiting and Piracy*, 22.
[10] John Spink and Zoltán Levente Fejes, "A Review of the Economic Impact of Counterfeiting and Piracy Methodologies and Assessment of Currently Utilized Estimates," *International Journal of Comparative and Applied Criminal Justice* 36, no. 4 (2012): 255, doi: 10.1080/01924036.2012.726320.
[11] Frontier Economics, *The Economic Impacts of Counterfeiting and Piracy*, 14–16.
[12] Brandon A. Sullivan et al., "Assessing the Developing Knowledge-Base of Product Counterfeiting: A Content Analysis of Four Decades of Research," *Trends in Organized Crime* 20, no. 3–4 (2017): 340, doi: 10.1007/s12117-016-9300-5.
[13] U.S. International Trade Commission (USITC), *Foreign Protection of Intellectual Property Rights and the Effects on U.S. Industry and Trade: Report to the United States Trade Representative, Investigation No. 332–245, Under Section 332(g) of the Tariff Act of 1930*, USITC Publication 2065 (Washington, DC: USITC, 1988), vii, https://www.usitc.gov/publications/332/pub2065.pdf.
[14] Executive Office of the President, Office of the U.S. Intellectual Property Enforcement Coordinator, *Supporting Innovation, Creativity, and Enterprise: Charting a Path Ahead; U.S. Joint Strategic Plan on Intellectual Property Enforcement, FY2017–2019* (Washington, DC: Executive Office of the President, 2016), 72, https://obamawhitehouse.archives.gov/sites/default/files/omb/IPEC/spotlight/eop_ipec_jointstrategicplan_hi-res.pdf.
[15] Spink and Fejes, "A Review of the Economic Impact," 256.
[16] U.S. Chamber of Commerce, Global Intellectual Property Center (GIPC), *Measuring the Magnitude of Global Counterfeiting: Creation of a Contemporary Global Measure of Physical Counterfeiting* (Washington, DC: U.S. Chamber of Commerce, 2016), 4, https://www.uschamber.com/sites/default/files/documents/files/measuringthemagnitudeofglobalcounterfeiting.pdf.
[17] Sullivan et al., "Assessing the Developing Knowledge-Base of Product Counterfeiting," 357.
[18] C. Steven Baker, *Fakes are Not Fashionable: A BBB Study of the Epidemic of Counterfeit Goods Sold Online* (Washington, DC: Better Business Bureau [BBB], May 2019), 2, https://www.bbb.org/globalassets/local-bbbs/st-louis-mo-142/st_louis_mo_142/studies/counterfeit-goods/BBB-Study-of-Counterfeit-Goods-Sold-Online.pdf.
[19] Sullivan et al., "Assessing the Developing Knowledge-Base of Product Counterfeiting," 357.
[20] Justin A. Heinonen and Jeremy M. Wilson, "Product Counterfeiting at the State Level: An Empirical Examination of Michigan-Related Incidents," *International Journal of Comparative and Applied Criminal Justice* 36, no. 4 (2012): 282, 285, doi: 10.1080/01924036.2012.721198.
[21] OECD, "Magnitude of Counterfeiting and Piracy of Tangible Products: An Update," November 2009, 2, https://www.oecd.org/industry/ind/44088872.pdf.
[22] U.S. Chamber of Commerce, GIPC, *Measuring the Magnitude of Global Counterfeiting*, 2; Frontier Economics, *The Economic Impacts of Counterfeiting and Piracy*, 14.
[23] OECD and EUIPO, *Trends in Trade in Counterfeit and Pirated Goods*, 45.
[24] Frontier Economics, *The Economic Impacts of Counterfeiting and Piracy*, 14, 22.
[25] Stijn Hoorens et al., *Measuring IPR Infringements in the Internal Market: Development of a New Approach to Estimating the Impact of Infringements on Sales* (Brussels: RAND Europe [EU], 2012), 56, https://www.rand.org/content/dam/rand/pubs/technical_reports/2012/RAND_TR1279.pdf.
[26] OECD and EUIPO, *Trade in Counterfeit Goods and Free Trade Zones* (Paris: OECD Publishing, 2018), 16, doi: 10.1787/9789264289550-en.
[27] OECD, *Mapping the Real Routes of Trade in Fake Goods: Highlights Brochure*, June 23, 2017, 10, 38, https://www.oecd.org/gov/risk/mapping-the-real-routes-of-trade-in-fake-goods-9789264278349-en.htm.
[28] U.S. Chamber of Commerce, GIPC, *Measuring the Magnitude of Global Counterfeiting*, 23.
[29] OECD and EUIPO, *Trends in Trade in Counterfeit and Pirated Goods*, 32.

[30] U.S. Chamber of Commerce, GIPC, *Measuring the Magnitude of Global Counterfeiting*, 16.
[31] Heinonen and Wilson, "Product Counterfeiting at the State Level," 279.
[32] Heinonen and Wilson, "Product Counterfeiting at the State Level," 276.
[33] Commission on the Theft of American Intellectual Property, *Update to the IP Commission Report: The Theft of American Intellectual Property; Reassessments of the Challenge and United States Policy* (Seattle: National Bureau of Asian Research, 2017), 1–2, http://ipcommission.org/report/IP_Commission_Report_Update_2017.pdf.
[34] Erwin A. Blackstone, Joseph P. Fuhr Jr., and Steve Pociask, "The Health and Economic Effects of Counterfeit Drugs," *American Health & Drug Benefits* 7, no. 4 (2014): 216–17, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4105729/.
[35] Commission on the Theft of American Intellectual Property, *Update to the IP Commission Report*, 2, 9.
[36] Frontier Economics, *The Economic Impacts of Counterfeiting and Piracy,* 49.
[37] U.S. Government Accountability Office (GAO), *Intellectual Property: Agencies Can Improve Efforts to Address Risks Posed by Changing Counterfeits Market*, GAO-18-216 (Washington, DC: GAO, 2018), 2, 21, https://www.gao.gov/assets/690/689713.pdf.
[38] Commission on the Theft of American Intellectual Property, *Update to the IP Commission Report*, 1–2, 4, 7, 9.
[39] James H. Lambert et al., "Multiscale Approach to the Security of Hardware Supply Chains for Energy Systems," *Environment Systems and Decisions* 33, no. 3 (2013): 326, doi: 10.1007/s10669-013-9465-2.
[40] Commission on the Theft of American Intellectual Property, *Update to the IP Commission Report*, 8.
[41] Blackstone, Fuhr, and Pociask, "The Health and Economic Effects of Counterfeit Drugs," 216–17.
[42] Jeremy M. Wilson, Clifford Grammich, and Fiona Chan, "Organizing for Brand Protection and Responding to Product Counterfeit Risk: An Analysis of Global Firms," *Journal of Brand Management* 23, no. 3 (2016): 346, doi: 10.1057/bm.2016.12.
[43] Clarivate Analytics, MarkMonitor, "Seven Best Practices for Fighting Counterfeit Sales Online" (white paper), 2017, 3, https://markmonitor.com/download/wp/wp-Fighting_Counterfeit_Sales.pdf.
[44] Clarivate Analytics, MarkMonitor, "Seven Best Practices," 3.
[45] Commission on the Theft of American Intellectual Property, *Update to the IP Commission Report*, 2, 9.
[46] Clarivate Analytics, MarkMonitor, "Seven Best Practices," 3.
[47] John Theriault, "Protecting the U.S. Medicine Supply: Integrating Approaches to Promote Safety," *Journal of Commercial Biotechnology* 19, no. 4 (2013): 31, doi: 10.5912/jcb634.
[48] Commission on the Theft of American Intellectual Property, *Update to the IP Commission Report*, 2, 13.
[49] GAO, *Intellectual Property*, 19, 28.
[50] GAO, *Intellectual Property*, 2, 27.
[51] John Spink et al., "Defining the Types of Counterfeiters, Counterfeiting, and Offender Organizations," *Crime Science* 2, no. 1 (2013): 2, doi: 10.1186/2193-7680-2-8.
[52] Frontier Economics, *The Economic Impacts of Counterfeiting and Piracy,* 49.
[53] International Chamber of Commerce (ICC), BASCAP (Business Action to Stop Counterfeiting and Piracy), *Roles and Responsibilities of Intermediaries: Fighting Counterfeiting and Piracy in the Supply Chain* (Paris: ICC, 2015), 89, https://cdn.iccwbo.org/content/uploads/sites/3/2015/03/ICC-BASCAP-Roles-and-Responsibilities-of-Intermediaries.pdf.
[54] Clarivate Analytics, MarkMonitor, "Seven Best Practices," 5.
[55] Annemarie Bridy, "Internet Payment Blockades," *Florida Law Review* 67, no. 5 (2016): 1552, https://scholarship.law.ufl.edu/flr/vol67/iss5/1.
[56] Meghan E. Hollis and Jeremy M. Wilson, "Who are the Guardians in Product Counterfeiting? A Theoretical Application of Routine Activities Theory," *Crime Prevention and Community Safety* 16, no. 3 (2014): 175–77, doi: 10.1057/cpcs.2014.6.
[57] Louise Nash, Gina Vetere, and Mark Young, "Responding to the Hidden Threat: How Luxury Brands are Fighting Back against Counterfeiting," *World Trademark Review* (February/March 2014): 59, https://www.cov.com/-/media/files/corporate/publications/2014/02/responding_to_the_hidden_threat_how_luxury_brands_are_fighting_back_against_counterfeiting.pdf; Hollis and Wilson, "Who are the Guardians," 175–77.
[58] Ujjwal Guin, Daniel DiMase, and Mohammad Tehranipoor, "A Comprehensive Framework for Counterfeit Defect Coverage Analysis and Detection Assessment," *Journal of Electronic Testing* 30, no. 1 (2014): 25–26, doi: 10.1007/s10836-013-5428-2.
[59] Hollis and Wilson, "Who are the Guardians," 176.
[60] ICC, BASCAP, *Roles and Responsibilities*, 49.
[61] ICC, BASCAP, *Roles and Responsibilities*, 63–64, 68.
[62] ICC, BASCAP, *Roles and Responsibilities*, 78, 81; Trustworthy Accountability Group (TAG), *Core Criteria for Effective Digital Advertising Assurance*, v. 1.0 (February 2015), 2, https://cdn2.hubspot.net/hubfs/2848641/TrustworthyAccountabilityGroup_May2017/Docs/Core-criteria_final.pdf.
[63] TAG, *Core Criteria for Effective Digital Advertising Assurance*, 2.
[64] ICC, BASCAP, *Roles and Responsibilities*, 78.
[65] Executive Office of the President, Office of the U.S. Intellectual Property Enforcement Coordinator, *Supporting Innovation*, 62.
[66] ICC, BASCAP, *Roles and Responsibilities*, 89.
[67] ICC, BASCAP, *Roles and Responsibilities*, 51, 79, 81.
[68] INTA, *Addressing the Sale of Counterfeits on the Internet* (New York: INTA, 2017), 7, https://www.inta.org/Advocacy/Documents/2018/Addressing_the_Sale_of_Counterfeits_on_the_Internet_021518.pdf.

[69] INTA, *Addressing the Sale of Counterfeits*, 7; TAG, *Core Criteria for Effective Digital Advertising Assurance*, 2; American Association of Advertising Agencies, "Industry Groups Urge Marketers to Address Online Piracy & Counterfeiting," May 3, 2012, https://www.aaaa.org/050312_online_piracy/.
[70] TAG, "About Us," accessed November 20, 2019, https://www.tagtoday.net/aboutus/.
[71] TAG, *Core Criteria for Effective Digital Advertising Assurance*, 3–4.
[72] Bridy, "Internet Payment Blockades," 1548–49; Executive Office of the President, Office of the U.S. Intellectual Property Enforcement Coordinator, *Supporting Innovation*, 62; ICC, BASCAP, *Roles and Responsibilities*, 90–91.
[73] Bridy, "Internet Payment Blockades," 1548.
[74] Bridy, "Internet Payment Blockades," 1559; ICC, BASCAP, *Roles and Responsibilities*, 90.
[75] Bridy, "Internet Payment Blockades," 1550.
[76] ICC, BASCAP, *Roles and Responsibilities*, 91.
[77] Nash, Vetere, Young, "Responding to the Hidden Threat," 59.
[78] Hollis and Wilson, "Who are the Guardians," 178, 181.
[79] Clarivate Analytics, MarkMonitor, "Seven Best Practices," 5.
[80] Nash, Vetere, Young, "Responding to the Hidden Threat," 59.
[81] Clarivate Analytics, MarkMonitor, "Seven Best Practices," 5.
[82] ICC, BASCAP, *Roles and Responsibilities*, 78–79.
[83] ICC, BASCAP, *Roles and Responsibilities*, 82.
[84] eBay, "Re: Comment Request; Report on the State of Counterfeit and Pirated Goods Trafficking and Recommendations (Docket No. 190703544-9544-01)," July 29, 2019, https://www.regulations.gov/document?D=DOC-2019-0003-0056; Alibaba Group, "Re: Presidential Memorandum on Combating Trafficking in Counterfeit and Pirated Goods (issued April 3, 2019); Docket ID: DOC-2019-0003," July 29, 2019, https://www.regulations.gov/document?D=DOC-2019-0003-0062.
[85] ICC, BASCAP, *Roles and Responsibilities*, 93.
[86] Bridy, "Internet Payment Blockades," 1552.
[87] OECD and EUIPO, *Misuse of Small Parcels for Trade in Counterfeit Goods* (Paris: OECD Publishing, 2018), 36, doi: 10.1787/9789264307858-en.
[88] U.S. Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), *Intellectual Property Rights: Fiscal Year 2012 Seizure Statistics*, 0172-0113 (Washington, DC: DHS, n.d.), 25, https://www.cbp.gov/sites/default/files/documents/FY2012%20IPR%20Seizure%20Statistics_0.pdf; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2013 Seizure Statistics*, 0204-0714 (Washington, DC: DHS, n.d.), 13, https://www.cbp.gov/sites/default/files/documents/ipr_annual_report_2013_072414%20Final.pdf; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2014 Seizure Statistics*, 1134-0915 (Washington, DC: DHS, 2015), 17, https://www.cbp.gov/sites/default/files/documents/IPR%20FY14%20Seizure%20Statistics%20Booklet_100515_spread_web.pdf; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2015 Seizure Statistics*, 0570-0916 (Washington, DC: DHS, 2017), 27, https://www.cbp.gov/sites/default/files/assets/documents/2017-Jan/2015%20IPR%20Annual%20Statistics.pdf; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2016 Seizure Statistics*, 0649-0917 (Washington, DC: DHS, 2018), 27, https://www.cbp.gov/sites/default/files/assets/documents/2018-Jan/FY2016%20IPR%20Seizure%20Statistics%20Book%20%28PDF%20Formatting%29_OT.pdf; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2017 Seizure Statistics*, 0785-0918 (Washington, DC: DHS, 2019), 29, https://www.cbp.gov/sites/default/files/assets/documents/2019-Apr/FY%202017%20Seizure%20Stats%20Booklet%20-%20508%20Compliant.pdf; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2018 Seizure Statistics*, 0917-0719 (Washington, DC: DHS, 2019), 28, https://www.cbp.gov/sites/default/files/assets/documents/2019-Aug/IPR_Annual-Report-FY-2018.pdf.
[89] Claudio Carpineto and Giovanni Romano, "Learning to Detect and Measure Fake E-Commerce Websites in Search Engine Results" (proceedings of the International Conference on Web Intelligence, Leipzig, Germany, August 23–26, 2017), 403–10, doi: 10.1145/3106426.3106441.
[90] DHS, CBP, "CBP Releases E-Commerce Strategy," March 6, 2018, https://www.cbp.gov/newsroom/national-media-release/cbp-releases-e-commerce-strategy.
[91] DHS, CBP, *Intellectual Property Rights: Fiscal Year 2018*, 15.
[92] DHS, CBP, *E-Commerce Strategy*, 0685–0218 (Washington, DC: DHS, 2018), 2, https://www.cbp.gov/sites/default/files/assets/documents/2018-Mar/CBP-E-Commerce-Strategic-Plan_0.pdf.
[93] OECD and EUIPO, *Misuse of Small Parcels for Trade in Counterfeit Goods*, 36.
[94] DHS, CBP, *Intellectual Property Rights: Fiscal Year 2018*, 16.
[95] DHS, CBP, *Intellectual Property Rights: Fiscal Year 2018*, 28.
[96] DHS, CBP, *Intellectual Property Rights: Fiscal Year 2012*, 25; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2013*, 13; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2014*, 17; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2015*, 27; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2016*, 27; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2017*, 29; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2018*, 28.
[97] Robert Klara, "Counterfeit Goods are a $460 Billion Industry, and Most are Bought and Sold Online," *AdWeek*, February 13, 2017, https://www.adweek.com/brand-marketing/counterfeit-goods-are-a-460-billion-industry-and-most-are-bought-and-sold-online/.
[98] Clarivate Analytics, MarkMonitor, *Online Barometer: Global Online Shopping Survey 2018; Facts, Figures, and Fakery*, 2018, 11, https://www.markmonitor.com/download/report/MarkMonitor_Online_Shopping_Barometer-q4-2018.pdf.

[99] Arthur Herman, *Crisis in the Mail: Fixing a Broken International Package System* (Washington, DC: Hudson Institute, 2017), 12, http://www.hudson.org/research/13401-crisis-in-the-mail-fixing-a-broken-international-package-system.
[100] Ashlesh Sharma et al., "The Fake vs Real Goods Problem: Microscopy and Machine Learning to the Rescue" (proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Halifax, Nova Scotia, August 13–17, 2017), 2011–19, doi: 10.1145/3097983.3098186.
[101] Dharmesh M. Mehta, "Amazon Project Zero," day one (Amazon blog), February 28, 2019, https://blog.aboutamazon.com/company-news/amazon-project-zero.
[102] Carpineto and Romano, "Learning to Detect and Measure Fake E-Commerce Websites," 403–10.
[103] John Wadleigh, Jake Drew, and Tyler Moore, "The E-Commerce Market for 'Lemons': Identification and Analysis of Websites Selling Counterfeit Goods" (proceedings of the 24th International Conference on World Wide Web, Florence, Italy, May 18–22, 2015), 1188–97, doi: 10.1145/2736277.2741658.
[104] Joshua Bote, "Woman in Coma after Using Face Cream Tainted with Mercury, Officials Say," *USA Today*, updated September 12, 2019, https://www.usatoday.com/story/news/health/2019/09/12/california-woman-coma-after-using-face-cream-tainted-mercury/2300376001/; Erin Heffernan, "Customs Officers Seize 2,400 Counterfeit Juul Products Sent from Hong Kong," *St. Louis-Post Dispatch*, November 26, 2019, https://www.stltoday.com/news/local/crime-and-courts/customs-officers-seize-counterfeit-juul-products-sent-from-hong-kong/article_0702e7b8-7784-51f0-b0a9-f5b005deb1ac.html.
[105] Jeremy M. Wilson, Brandon A. Sullivan, and Meghan E. Hollis, "'Measuring the Unmeasurable': Approaches to Assessing the Nature and Extent of Product Counterfeiting," *International Criminal Justice Review* 26, no. 3 (2016): 261, doi: 10.1177/1057567716644766.
[106] Michele Diane Forzley, "Counterfeit Goods and the Public's Health and Safety," July 2003, iii, https://www.researchgate.net/publication/228171939.
[107] Kristina M. L. Acri, *Pharmaceutical Counterfeiting: Endangering Public Health, Society and the Economy* (Vancouver, Canada: Fraser Institute, 2018), 4, https://www.fraserinstitute.org/sites/default/files/pharmaceutical-counterfeiting-endangering-public-health-society-and-the-economy.pdf.
[108] Heinonen and Wilson, "Product Counterfeiting at the State Level," 274; Forzley, "Counterfeit Goods," ii–iii.
[109] Forzley, "Counterfeit Goods," ii–iii.
[110] Theriault, "Protecting the U.S. Medicine Supply," 31; Blackstone, Fuhr, and Pociask, "The Health and Economic Effects of Counterfeit Drugs," 217; András Fittler et al., "A Challenge for Healthcare but Just Another Opportunity for Illegitimate Online Sellers: Dubious Market of Shortage Oncology Drugs," *PLoS One* 13, no. 8 (2018): e0203185. doi: 10.1371/journal.pone.0203185.
[111] Acri, *Pharmaceutical Counterfeiting*, 12.
[112] Clarivate Analytics, MarkMonitor, *Online Barometer: Global Online Shopping Survey 2017; Consumer Goods*, 2017, 9, https://www.markmonitor.com/download/report/MarkMonitor_Online_Shopping_Report-2017-UK.pdf; Acri, *Pharmaceutical Counterfeiting*, 24, 26.
[113] DHS, CBP, *Intellectual Property Rights: Fiscal Year 2012*, 18.
[114] Heinonen and Wilson, "Product Counterfeiting at the State Level," 273; National Intellectual Property Rights Coordination Center (IPR Center), *Intellectual Property Rights Violations: A Report on Threats to United States Interests at Home and Abroad* (Washington, DC: IPR Center, 2011), 20, http://web.archive.org/web/20170507162357/https://www.iprcenter.gov/reports/ipr-center-reports/IPR%20Center%20Threat%20Report%20and%20Survey.pdf/; DHS, CBP, *Intellectual Property Rights: Fiscal Year 2015*, 16.
[115] GAO, *Intellectual Property*, 8.
[116] U.S. Senate, *Hearing on Counterfeits and their Impact on Consumer Health and Safety, Before the Committee on the Judiciary* (114th Cong., 2nd sess. April 27, 2016), "Prepared Statement of Bruce Foucart," 7, https://www.hsdl.org/?view&did=799267.
[117] OECD, *The Economic Impact of Counterfeiting*, (Paris: OECD Publishing, 1998), 15, https://www.oecd.org/sti/ind/2090589.pdf.
[118] U.N. Office on Drugs and Crime (UNODC), "Focus On: The Illicit Trafficking of Counterfeit Goods," 6, accessed August 30, 2019, https://www.unodc.org/documents/ropan/Campaign/Counterfeit_Goods/The_Illicit_Trafficking_of_Counterfeit_Goods_and_Transnational_Organized_Crime.pdf.
[119] Brandon A. Sullivan and Jeremy M. Wilson, "An Empirical Examination of Product Counterfeiting Crime Impacting the U.S. Military," *Trends in Organized Crime* 20, no. 3–4 (2017): 317–38, doi: 10.1007/s12117-017-9306-7.
[120] Georgios A. Antonopoulos et al., "An Introduction to the Special Issue on 'Counterfeiting,'" *Trends in Organized Crime* 20, no. 3–4 (2017): 248, doi: 10.1007/s12117-017-9319-2.
[121] U.S. Senate, *Hearing on Counterfeits and their Impact*, "David Hirschmann," 4.
[122] UNODC, *Focus On: The Illicit Trafficking of Counterfeit Goods and Transnational Organized Crime* (Vienna: UNODC, 2014), 5, https://www.unodc.org/documents/counterfeit/FocusSheet/Counterfeit_focussheet_EN_HIRES.pdf.
[123] Bastiaan J. Venhuis et al., "Oncology Drugs in the Crosshairs of Pharmaceutical Crime," *Lancet Oncology* 19, no. 4 (2018): e209, doi: 10.1016/S1470-2045(18)30101-3; Abdulaziz Fahad Abdulaziz Alghannam et al., "A Systematic Review of Counterfeit and Substandard Medicines in Field Quality Surveys," *Integrated Pharmacy Research and Practice* 3 (2014): 74, doi: 10.2147/IPRP.S63690.
[124] Forzley, "Counterfeit Goods," ii.
[125] Katrin Weigmann, "Elixirs of Death," *EMBO Reports: Science & Society* 14, no. 7 (2013): 597, doi: 10.1038/embor.2013.82.
[126] Fiona Clark, "Rise in Online Pharmacies Sees Counterfeit Drugs Go Global," *Lancet* 386, no. 10001 (2015): 1327–8, doi: 10.1016/S0140-6736(15)00394-3.
[127] Tariq Almuzaini, Imti Choonara, and Helen Sammons, "Substandard and Counterfeit Medicines: A Systematic Review of the Literature," *BMJ Open* 3, no. 8 (2013): e002923, doi: 10.1136/bmjopen-2013-002923.
[128] Weigmann, "Elixirs of Death," 597.

[129] John Spink and Douglas C. Moyer, "Defining the Public Health Threat of Food Fraud," *Journal of Food Science* 76, no. 9 (2011): R159, R162, doi: 10.1111/j.1750-3841.2011.02417.x.
[130] UNODC, "Focus On: The Illicit Trafficking of Counterfeit Goods," 6.
[131] Heinonen and Wilson, "Product Counterfeiting at the State Level," 274.
[132] Sullivan and Wilson, "An Empirical Examination of Product Counterfeiting," 318.
[133] Flávia Renata Pinho de Lima et al., "Systematic Review: Resilience Enablers to Combat Counterfeit Medicines," *Supply Chain Management* 23, no. 2 (2018): 117, doi: 10.1108/SCM-04-2017-0155.
[134] Forzley, "Counterfeit Goods," ii; Svetlana Golocorbin-Kon et al., "Counterfeit Drugs as a Common Risk for the Successful Treatment [*sic*]," *Clinical Therapeutics* 39, no. 8–Supplement (2017): e30, doi: 10.1016/j.clinthera.2017.05.092; UNODC, "Focus On: The Illicit Trafficking of Counterfeit Goods," 5.
[135] Theriault, "Protecting the U.S. Medicine Supply," 31.
[136] Acri, *Pharmaceutical Counterfeiting*, 26.
[137] Baker, *Fakes are Not Fashionable*, 4.
[138] Insight Strategy Group, *Gen Z Insights: Brands and Counterfeit Products* (New York: INTA, 2019): 32, https://www.inta.org/Communications/Documents/INTA%20Gen%20Z%20Insights_Global.pdf.
[139] Baker, *Fakes are Not Fashionable*, 4.
[140] Clarivate Analytics, MarkMonitor, *Online Barometer: Global Online Shopping Survey 2018*.
[141] Johanna Held and Claas Christian Germelmann, "Deception in Consumer Behavior Research: A Literature Review on Objective and Perceived Deception," *Projectics* 21, no.3 (2018): 119–45, doi: 10.3917/proj.021.0119.
[142] Jeffrey Hardy, "Research Report on Consumer Attitudes and Perceptions on Counterfeiting and Piracy" (World Intellectual Property Organization, Advisory Committee on Enforcement, Sixth Session, Geneva, Switzerland, December 1–2, 2010), https://www.wipo.int/meetings/en/doc_details.jsp?doc_id=142755.
[143] Clarivate Analytics, MarkMonitor, *Online Barometer: Global Online Shopping Survey 2017*.
[144] John Spink, *Annual Survey Study of Product Counterfeiting by Michigan Residents Utilizing the State of the State Survey: Update 2011-2012-2013; A Survey of Attitudes toward Product Counterfeiting, Related Law Enforcement Priority Setting, and Internet Medicines Purchasing Behaviors,* Fall 2013, http://foodfraud.msu.edu/wp-content/uploads/2014/07/SOSS-MAPPR-IPPSR-2011-2012-2013-Final-Report-v06-Final.pdf.
[145] Danielle Commisso, "Men and High-Earners are More Likely to Buy Counterfeit Goods," CivicScience, August 13, 2019, https://civicscience.com/men-and-high-earners-are-more-likely-to-buy-counterfeit-goods/.
[146] Clarivate Analytics, MarkMonitor, *Shopping Report*, Fall 2014, 9, https://www.markmonitor.com/download/report/MarkMonitor_Shopping_Report-2014.pdf.
[147] Clarivate Analytics, MarkMonitor, *Online Barometer: Global Consumer Shopping Habits Survey 2015*, 2016, 12, https://www.markmonitor.com/download/report/MarkMonitor_Online_Barometer-2015.pdf.
[148] Hardy, "Research Report on Consumer Attitudes."
[149] Karen E. Edwards and Jason M. Carpenter, "The Face of Fakes: U.S. Consumers and Counterfeit Fashion Products," *Journal of Business and Economics* 5, no. 9 (2014): 1568–78, doi: 10.15341/jbe(2155-7950)/09.05.2014/012.
[150] Commisso, "Men and High-Earners."
[151] Insight Strategy Group, *Gen Z Insights*, 32.
[152] Baker, *Fakes are Not Fashionable*, 1; Sara Quach and Park Thaichon, "Dark Motives—Counterfeit Selling Framework: An Investigate [*sic*] on the Supply Side of the Non-Deceptive Market," *Marketing Intelligence & Planning* 36, no. 2 (2018): 245–59, doi: 10.1108/MIP-04-2017-0069.
[153] Ryan Williams, "How to Stop Super Fakes," *Red Points* (blog), June 29, 2018, https://blog.redpoints.com/en/how-to-stop-super-fakes.
[154] Gordon McConnell, "Intellectual Property, Too 2D for a 3D Printing World?," *Red Points* (blog), October 17, 2017, https://blog.redpoints.com/en/intellectual-property-too-2d-for-3d-printing.
[155] Andrea Stroppa, Daniele di Stefano, and Bernardo Parrella, "Social Media and Luxury Goods Counterfeit: A Growing Concern for Government, Industry and Consumers Worldwide," Ghost Data, May 2016, 9, https://www.washingtonpost.com/blogs/the-switch/files/2016/05/IG_A2016_ST2.pdf; Andrea Stroppa et al., *Instagram and Counterfeiting in 2019: New Features, Old Problems* (Rome: Ghost Data, 2019), 41, https://ghostdata.io/report/Instagram_Counterfeiting_GD.pdf.
[156] Ghost Data Analytics, "About Ghost Data," accessed August 26, 2019, https://ghostdata.io/.
[157] OECD and EUIPO, *Trade in Counterfeit and Pirated Goods*, 35, 57.
[158] Baker, *Fakes are Not Fashionable*, 7.
[159] OECD, *Illicit Trade: Converging Criminal Networks* (Paris: OECD Publishing, 2016), 22–23, https://www.oecd.org/gov/risk/charting-illicit-trade-9789264251847-en.htm.
[160] Laura Meraviglia, "Counterfeiting, Fashion, and the Civil Society," *Journal of Fashion Marketing and Management* 19, no. 3 (2015): 239, doi: 10.1108/JFMM-06-2013-0084.
[161] Alexandra Hall, Rosa Koenraadt, and Georgios A. Antonopoulos, "Illicit Pharmaceutical Networks in Europe: Organizing the Illicit Medicine Market in the United Kingdom and the Netherlands," *Trends in Organized Crime* 20, no. 3–4 (2017): 309, doi: 10.1007/s12117-017-9304-9.
[162] Executive Office of the President, Office of the U.S. Intellectual Property Enforcement Coordinator, *Supporting Innovation*, 72.

[163] Baker, *Fakes are Not Fashionable*, 6.
[164] Dennis Collopy et al., *Share and Share Alike: The Challenges from Social Media for Intellectual Property Rights* (London: U.K. Intellectual Property Office, 2017), 4, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/641461/Share_and_share_alike_report.pdf.
[165] Executive Office of the President, Office of the U.S. Intellectual Property Enforcement Coordinator, *Supporting Innovation*, 72.
[166] Stroppa, di Stefano, and Parrella, "Social Media and Luxury Goods," 9; Stroppa et al., *Instagram and Counterfeiting*, 41.
[167] Quach and Thaichon, "Dark Motives," 252.
[168] Quach and Thaichon, "Dark Motives," 253.
[169] Baker, *Fakes are Not Fashionable*, 5.
[170] Facebook, "Create Ads that Click to WhatsApp in Ads Manager," accessed August 26, 2019, https://www.facebook.com/business/help/447934475640650).
[171] Kurt Wagner, "Instagram Will Now Let You Buy Products Directly Inside the App," *Vox*, March 19, 2019, https://www.vox.com/2019/3/19/18271705/instagram-shopping-retail-direct-checkout-commerce.
[172] Quach and Thaichon, "Dark Motives," 253.
[173] Stroppa, di Stefano, and Parrella, "Social Media and Luxury Goods," 9; Stroppa et al., *Instagram and Counterfeiting*, 41.
[174] Baker, *Fakes are Not Fashionable*, 1.
[175] Spink et al., "Defining the Types of Counterfeiters, Counterfeiting, and Offender Organizations," 5.
[176] Tim K. Mackey and Janani Kalyanam, "Detection of Illicit Online Sales of Fentanyls via Twitter" [version 1; peer review: 3 approved], *F1000Research* 6, no. 1937 (2017): 3, https://www.f1000research.com/articles/6-1937/v1.

12. SELECTED BIBLIOGRAPHY

Acri, Kristina M. L. *Pharmaceutical Counterfeiting: Endangering Public Health, Society and the Economy*. Vancouver, Canada: Fraser Institute, 2018. https://www.fraserinstitute.org/sites/default/files/pharmaceutical-counterfeiting-endangering-public-health-society-and-the-economy.pdf.

Alghannam, Abdulaziz Fahad Abdulaziz, Zoe Aslanpour, Sara Evans, and Fabrizio Schifano. "A Systematic Review of Counterfeit and Substandard Medicines in Field Quality Surveys." *Integrated Pharmacy Research and Practice* 3 (2014): 71–88. doi: 10.2147/IPRP.S63690.

Almuzaini, Tariq, Imti Choonara, and Helen Sammons. "Substandard and Counterfeit Medicines: A Systematic Review of the Literature." *BMJ Open* 3, no. 8 (2013): e002923. doi: 10.1136/bmjopen-2013-002923.

Anonymous. "Counterfeit Drugs: A Growing Global Threat." *Lancet* 379, no. 9817 (2012): 685. doi: 10.1016/S0140-6736(12)60289-X.

Antonopoulos, Georgios A., Alexandra Hall, Joanna Large, and Anqi Shen. "An Introduction to the Special Issue on 'Counterfeiting.'" *Trends in Organized Crime* 20, no. 3–4 (2017): 247–51. doi: 10.1007/s12117-017-9319-2.

Baker, C. Steven. *Fakes are Not Fashionable: A BBB Study of the Epidemic of Counterfeit Goods Sold Online*. Washington, DC: Better Business Bureau, May 2019. https://www.bbb.org/globalassets/local-bbbs/st-louis-mo-142/st_louis_mo_142/studies/counterfeit-goods/BBB-Study-of-Counterfeit-Goods-Sold-Online.pdf.

Blackstone, Erwin A., Joseph P. Fuhr Jr., and Steve Pociask. "The Health and Economic Effects of Counterfeit Drugs." *American Health & Drug Benefits* 7, no. 4 (2014): 216–24. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4105729/.

Bridy, Annemarie. "Internet Payment Blockades." *Florida Law Review* 67, no. 5 (2016): 1523–68. https://scholarship.law.ufl.edu/flr/vol67/iss5/1.

Cardoso-Palacios, Carlos, and Ingela Lanekoff. "Direct Analysis of Pharmaceutical Drugs Using Nano-DESI MS." *Journal of Analytical Methods in Chemistry* 3591908 (2016). doi: 10.1155/2016/3591908.

Carpineto, Claudio, and Giovanni Romano. "Learning to Detect and Measure Fake E-Commerce Websites in Search Engine Results." Proceedings of the International Conference on Web Intelligence, Leipzig, Germany, August 23–26, 2017, 403–10. doi: 10.1145/3106426.3106441.

Chaudhry, Peggy E., and Ludovica Cesareo. "Fake and Pirated: Do Consumers Care?" *Journal of Business Strategy* 38, no. 6 (2017): 11–19. doi: 10.1108/JBS-08-2016-0080.

Clarivate Analytics. MarkMonitor. *Online Barometer: Global Consumer Shopping Habits Survey 2015*. 2016. https://www.markmonitor.com/download/report/MarkMonitor_Online_Barometer-2015.pdf.

———. MarkMonitor. *Online Barometer: Global Online Shopping Survey 2017; Consumer Goods*. 2017. https://www.markmonitor.com/download/report/MarkMonitor_Online_Shopping_Report-2017-UK.pdf.

———. MarkMonitor. *Online Barometer: Global Online Shopping Survey 2018; Facts, Figures, and Fakery*. 2018. https://www.markmonitor.com/download/report/MarkMonitor_Online_Shopping_Barometer-q4-2018.pdf.

———. MarkMonitor. "Seven Best Practices for Fighting Counterfeit Sales Online." White Paper. 2017. https://markmonitor.com/download/wp/wp-Fighting_Counterfeit_Sales.pdf.

———. MarkMonitor. *Shopping Report*. Fall 2014. https://www.markmonitor.com/download/report/MarkMonitor_Shopping_Report-2014.pdf.

Clark, Fiona. "Rise in Online Pharmacies Sees Counterfeit Drugs Go Global." *Lancet* 386, no. 10001 (2015): 1327–8. doi: 10.1016/S0140-6736(15)00394-3.

Collopy, Dennis, Tim Drye, Florian Koempel, Peter Jenner, and Chris Carey. *Share and Share Alike: The Challenges from Social Media for Intellectual Property Rights*. London: U.K. Intellectual Property Office, 2017. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/641461/Share_and_share_alike_report.pdf.

Commission on the Theft of American Intellectual Property. *The IP Commission Report: The Report of the Commission on the Theft of American Intellectual Property*. Seattle: National Bureau of Asian Research, 2013. http://www.ipcommission.org/report/ip_commission_report_052213.pdf.

———. *Update to the IP Commission Report: The Theft of American Intellectual Property; Reassessments of the Challenge and United States Policy*. Seattle: National Bureau of Asian Research, 2017. http://ipcommission.org/report/IP_Commission_Report_Update_2017.pdf.

Commisso, Danielle. "Men and High-Earners are More Likely to Buy Counterfeit Goods." CivicScience. August 13, 2019. https://civicscience.com/men-and-high-earners-are-more-likely-to-buy-counterfeit-goods/.

de Lima, Flávia Renata Pinho, Andrea Lago Da Silva, Moacir Godinho Filho, and Eduardo Mario Dias. "Systematic Review: Resilience Enablers to Combat Counterfeit Medicines." *Supply Chain Management* 23, no. 2 (2018): 117–35. doi: 10.1108/SCM-04-2017-0155.

Der, Matthew F., Lawrence K. Saul, Stefan Savage, and Geoffrey M. Voelker. "Knock It Off: Profiling the Online Storefronts of Counterfeit Merchandise." Proceedings of the 20th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, New York, NY, August 24–27, 2017, 1759–68. doi: 10.1145/2623330.2623354.

Edwards, Karen E., and Jason M. Carpenter. "The Face of Fakes: U.S. Consumers and Counterfeit Fashion Products." *Journal of Business and Economics* 5, no. 9 (2014): 1568–78. doi: 10.15341/jbe(2155-7950)/09.05.2014/012.

Eisend, Martin, and Pakize Schuchert-Güler. "Explaining Counterfeit Purchases: A Review and Preview." *Academy of Marketing Science Review* 12 (2006). http://www.amsreview.org/articles/eisend12-2006.pdf.

Executive Office of the President. Office of the U.S. Intellectual Property Enforcement Coordinator. *Supporting Innovation, Creativity, and Enterprise: Charting a Path Ahead; U.S. Joint Strategic Plan on Intellectual Property Enforcement, FY2017–2019*. Washington, DC: Executive Office of the President, 2016. https://obamawhitehouse.archives.gov/sites/default/files/omb/IPEC/spotlight/eop_ipec_jointstrategicplan_hi-res.pdf.

Fittler, András, Róbert György Vida, Valter Rádics, and Lajos Botz. "A Challenge for Healthcare but Just Another Opportunity for Illegitimate Online Sellers: Dubious Market of Shortage Oncology Drugs." *PLoS One* 13, no. 8 (2018): e0203185. doi: 10.1371/journal.pone.0203185.

Forzley, Michele Diane. "Counterfeit Goods and the Public's Health and Safety." July 2003. https://www.researchgate.net/publication/228171939.

Frontier Economics. *The Economic Impacts of Counterfeiting and Piracy*. New York: International Trademark Association, 2017. https://www.inta.org/Communications/Documents/2017_Frontier_Report.pdf.

Golocorbin-Kon, Svetlana, Mladena Lalic-Popovic, Nebojsa Pavlovic, Sasa Vukmirovic, Jelena Cvejic Hogervorst, Vladimir Maksimovic, and Momir Mikov. "Counterfeit Drugs as a Common Risk for the Successful Treatment [*sic*]." *Clinical Therapeutics* 39, no. 8–Supplement (2017): e30. doi: 10.1016/j.clinthera.2017.05.092.

Guin, Ujjwal, Daniel DiMase, and Mohammad Tehranipoor. "A Comprehensive Framework for Counterfeit Defect Coverage Analysis and Detection Assessment." *Journal of Electronic Testing* 30, no. 1 (2014): 25–40. doi: 10.1007/s10836-013-5428-2.

———. "Counterfeit Integrated Circuits: Detection, Avoidance, and the Challenges Ahead." *Journal of Electronic Testing* 30, no. 1 (2014): 9–23. doi: 10.1007/s10836-013-5430-8.

Hall, Alexandra, Rosa Koenraadt, and Georgios A. Antonopoulos. "Illicit Pharmaceutical Networks in Europe: Organizing the Illicit Medicine Market in the United Kingdom and the Netherlands." *Trends in Organized Crime* 20, no. 3–4 (2017): 296–315. doi: 10.1007/s12117-017-9304-9.

Hardy, Jeffrey. "Research Report on Consumer Attitudes and Perceptions on Counterfeiting and Piracy." World Intellectual Property Organization, Advisory Committee on Enforcement, Sixth Session, Geneva, Switzerland, December 1–2, 2010. https://www.wipo.int/meetings/en/doc_details.jsp?doc_id=142755.

Heinonen, Justin A., and Jeremy M. Wilson. "Product Counterfeiting at the State Level: An Empirical Examination of Michigan-Related Incidents." *International Journal of Comparative and Applied Criminal Justice* 36, no. 4 (2012): 273–90. doi: 10.1080/01924036.2012.721198.

Held, Johanna, and Claas Christian Germelmann. "Deception in Consumer Behavior Research: A Literature Review on Objective and Perceived Deception." *Projectics* 21, no.3 (2018): 119–45. doi: 10.3917/proj.021.0119.

Herman, Arthur. *Crisis in the Mail: Fixing a Broken International Package System*. Washington, DC: Hudson Institute, 2017. http://www.hudson.org/research/13401-crisis-in-the-mail-fixing-a-broken-international-package-system.

Hoecht, Andreas, and Paul Trott. "How Should Firms Deal with Counterfeiting?: A Review of the Success Conditions of Anti-Counterfeiting Strategies." *International Journal of Emerging Markets* 9, no. 1 (2014): 98–119. doi: 10.1108/IJOEM-02-2011-0014.

Hollis, Meghan E., and Jeremy M. Wilson. "Who are the Guardians in Product Counterfeiting? A Theoretical Application of Routine Activities Theory." *Crime Prevention and Community Safety* 16, no. 3 (2014): 169–88. doi: 10.1057/cpcs.2014.6.

Hoorens, Stijn, Priscillia Hunt, Alessandro Malchiodi, Rosalie Liccardo Pacula, Srikanth Kadiyala, Lila Rabinovich, and Barrie Irving. *Measuring IPR Infringements in the Internal Market: Development of a New Approach to Estimating the Impact of Infringements on Sales*. Brussels: RAND Europe (EU), 2012. https://www.rand.org/content/dam/rand/pubs/technical_reports/2012/RAND_TR1279.pdf.

Insight Strategy Group. *Gen Z Insights: Brands and Counterfeit Products*. New York: International Trademark Association, 2019. https://www.inta.org/Communications/Documents/INTA%20Gen%20Z%20Insights_Global.pdf.

International Chamber of Commerce (ICC). BASCAP (Business Action to Stop Counterfeiting and Piracy). *Roles and Responsibilities of Intermediaries: Fighting Counterfeiting and Piracy in the Supply Chain*. Paris: ICC, 2015. https://cdn.iccwbo.org/content/uploads/sites/3/2015/03/ICC-BASCAP-Roles-and-Responsibilities-of-Intermediaries.pdf.

International Trademark Association. *Addressing the Sale of Counterfeits on the Internet*. New York: International Trademark Association, 2017. https://www.inta.org/Advocacy/Documents/2018/Addressing_the_Sale_of_Counterfeits_on_the_Internet_021518.pdf.

Klara, Robert. "Counterfeit Goods are a $460 Billion Industry, and Most are Bought and Sold Online." *AdWeek*. February 13, 2017. https://www.adweek.com/brand-marketing/counterfeit-goods-are-a-460-billion-industry-and-most-are-bought-and-sold-online/.

Lambert, James H., Jeffrey M. Keisler, William E. Wheeler, Zachary A. Collier, and Igor Linkov. "Multiscale Approach to the Security of Hardware Supply Chains for Energy Systems." *Environment Systems & Decisions* 33, no. 3 (2013): 326–34. doi: 10.1007/s10669-013-9465-2.

Mackey, Tim K., and Janani Kalyanam. "Detection of Illicit Online Sales of Fentanyls via Twitter" [version 1; peer review: 3 approved]. *F1000Research* 6, no. 1937 (2017). https://www.f1000research.com/articles/6-1937/v1.

Meraviglia, Laura. "Counterfeiting, Fashion, and the Civil Society." *Journal of Fashion Marketing and Management* 19, no. 3 (2015): 230–48. doi: 10.1108/JFMM-06-2013-0084.

Nash, Louise, Gina Vetere, and Mark Young. "Responding to the Hidden Threat: How Luxury Brands are Fighting Back against Counterfeiting." *World Trademark Review* (February/March 2014): 58–61. https://www.cov.com/-/media/files/corporate/publications/2014/02/responding_to_the_hidden_threat_how_luxury_brands_are_fighting_back_against_counterfeiting.pdf.

National Intellectual Property Rights Coordination Center (IPR Center). *Intellectual Property Rights Violations: A Report on Threats to United States Interests at Home and Abroad*. Washington, DC: IPR Center, 2011. http://web.archive.org/web/20170507162357/https://www.iprcenter.gov/reports/ipr-center-reports/IPR%20Center%20Threat%20Report%20and%20Survey.pdf/.

Newton, Paul N., Abdinasir A. Amin, Chris Bird, Phillip Passmore, Graham Dukes, Göran Tomson, and Bright Simons et al. "The Primacy of Public Health Considerations in Defining Poor Quality Medicines." *PLoS Medicine* 8, no. 12 (2011): e1001139. doi: 10.1371/journal.pmed.1001139.

Organisation for Economic Co-operation and Development (OECD). *The Economic Impact of Counterfeiting*. Paris: OECD Publishing, 1998. https://www.oecd.org/sti/ind/2090589.pdf.

———. *Governance Frameworks to Counter Illicit Trade*. Paris: OECD Publishing, 2018. doi: 10.1787/9789264291652-en.

———. *Illicit Trade: Converging Criminal Networks*. Paris: OECD Publishing, 2016. https://www.oecd.org/gov/risk/charting-illicit-trade-9789264251847-en.htm.

———. "Magnitude of Counterfeiting and Piracy of Tangible Products: An Update." November 2009. https://www.oecd.org/industry/ind/44088872.pdf.

Organisation for Economic Co-operation and Development, and European Union Intellectual Property Office. *Mapping the Real Routes of Trade in Fake Goods*. Paris: OECD Publishing, 2017. doi: 10.1787/9789264278349-en.

———. *Mapping the Real Routes of Trade in Fake Goods: Highlights Brochure*. June 23, 2017. https://www.oecd.org/gov/risk/mapping-the-real-routes-of-trade-in-fake-goods-9789264278349-en.htm.

———. *Misuse of Small Parcels for Trade in Counterfeit Goods*. Paris: OECD Publishing, 2018. doi: 10.1787/9789264307858-en.

———. *Trade in Counterfeit and Pirated Goods: Mapping the Economic Impact*. Paris: OECD Publishing, 2016. doi: 10.1787/9789264252653-en.

———. *Trade in Counterfeit Goods and Free Trade Zones*. Paris: OECD Publishing, 2018. doi: 10.1787/9789264289550-en.

———. *Trends in Trade in Counterfeit and Pirated Goods*. Paris: OECD Publishing, 2019. doi: 10.1787/g2g9f533-en.

———. *Why Do Countries Export Fakes? The Role of Governance Frameworks, Enforcement and Socio-Economic Factors*. Paris: OECD Publishing, 2018. https://www.oecd-ilibrary.org/governance/why-do-countries-export-fakes_9789264302464-en.

Quach, Sara, and Park Thaichon. "Dark Motives—Counterfeit Selling Framework: An Investigate [*sic*] on the Supply Side of the Non-Deceptive Market." *Marketing Intelligence & Planning* 36, no. 2 (2018): 245–59. doi: 10.1108/MIP-04-2017-0069.

Rahm, Erhard. "Discovering Product Counterfeits in Online Shops: A Big Data Integration Challenge." *Journal of Data and Information Quality* 5, no. 1–2 (2014). doi: 10.1145/2629605.

Shanley, Agnes. "Synchronizing Anti-Counterfeiting Efforts." *Pharmaceutical Technology* 41, no. 6 (2017): 62, 65. ProQuest (1914146217).

Sharma, Ashlesh, Vidyuth Srinivasan, Vishal Kanchan, and Lakshminarayanan Subramanian. "The Fake vs Real Goods Problem: Microscopy and Machine Learning to the Rescue." Proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Halifax, Nova Scotia, August 13–17, 2017, 2011–19. doi: 10.1145/3097983.3098186.

Simmers, Christina S., Allen D. Schaefer, and R. Stephen Parker. "Counterfeit Luxury Goods Purchase Motivation: A Cultural Comparison." *Journal of International Business and Cultural Studies* 9 (2015). https://www.aabri.com/manuscripts/152306.pdf.

Spink, John. *Annual Survey Study of Product Counterfeiting by Michigan Residents Utilizing the State of the State Survey: Update 2011-2012-2013; A Survey of Attitudes toward Product Counterfeiting, Related Law Enforcement Priority Setting, and Internet Medicines Purchasing Behaviors*. Fall 2013. http://foodfraud.msu.edu/wp-content/uploads/2014/07/SOSS-MAPPR-IPPSR-2011-2012-2013-Final-Report-v06-Final.pdf.

———. "Product Fraud and Product Counterfeiting as a Source of Terrorist Financing." *Security Journal* 30, no. 2 (2017): 640–5. doi: 10.1057/sj.2014.46.

Spink, John, and Zoltán Levente Fejes. "A Review of the Economic Impact of Counterfeiting and Piracy Methodologies and Assessment of Currently Utilized Estimates." *International Journal of Comparative and Applied Criminal Justice* 36, no. 4 (2012): 249–71. doi: 10.1080/01924036.2012.726320.

Spink, John, and Douglas C. Moyer. "Defining the Public Health Threat of Food Fraud." *Journal of Food Science* 76, no. 9 (2011): R157–R163. doi: 10.1111/j.1750-3841.2011.02417.x.

Spink, John, Douglas C. Moyer, Hyeonho Park, and Justin A. Heinonen. "Defining the Types of Counterfeiters, Counterfeiting, and Offender Organizations." *Crime Science* 2, no. 1 (2013). doi: 10.1186/2193-7680-2-8.

Stroppa, Andrea, Daniele di Stefano, and Bernardo Parrella. "Social Media and Luxury Goods Counterfeit: A Growing Concern for Government, Industry and Consumers Worldwide." Ghost Data, May 2016. https://www.washingtonpost.com/blogs/the-switch/files/2016/05/IG_A2016_ST2.pdf.

Stroppa, Andrea, Davide Gatto, Lev Pasha, and Bernardo Parrella. *Instagram and Counterfeiting in 2019: New Features, Old Problems*. Rome: Ghost Data, 2019. https://ghostdata.io/report/Instagram_Counterfeiting_GD.pdf.

Sullivan, Brandon A., Fiona Chan, Roy Fenoff, and Jeremy M. Wilson. "Assessing the Developing Knowledge-Base of Product Counterfeiting: A Content Analysis of Four Decades of Research." *Trends in Organized Crime* 20, no. 3–4 (2017): 338–69. doi: 10.1007/s12117-016-9300-5.

Sullivan, Brandon A., and Jeremy M. Wilson. "An Empirical Examination of Product Counterfeiting Crime Impacting the U.S. Military." *Trends in Organized Crime* 20, no. 3–4 (2017): 316–37. doi: 10.1007/s12117-017-9306-7.

Taylor, Emma, Ashley C. Banyard, Hervé Bourhy, Florence Cliquet, Hildegund Ertl, Christine Fehlner-Gardiner, and Daniel L. Horton et al. "Avoiding Preventable Deaths: The Scourge of Counterfeit Rabies Vaccines." *Vaccine* 37, no. 17 (2019): 2285–7. doi: 10.1016/j.vaccine.2019.03.037.

Theriault, John. "Protecting the U.S. Medicine Supply: Integrating Approaches to Promote Safety." *Journal of Commercial Biotechnology* 19, no. 4 (2013): 29–34. doi: 10.5912/jcb634.

Trustworthy Accountability Group. *Core Criteria for Effective Digital Advertising Assurance*. Version 1.0. February 2015. https://cdn2.hubspot.net/hubfs/2848641/TrustworthyAccountabilityGroup_May2017/Docs/Core-criteria_final.pdf.

U.N. Office on Drugs and Crime (UNODC). *Focus On: The Illicit Trafficking of Counterfeit Goods and Transnational Organized Crime*. Vienna: UNODC, 2014. https://www.unodc.org/documents/counterfeit/FocusSheet/Counterfeit_focussheet_EN_HIRES.pdf.

———. "Focus On: The Illicit Trafficking of Counterfeit Goods and Transnational Organized Crime." Accessed August 30, 2019. https://www.unodc.org/documents/ropan/Campaign/Counterfeit_Goods/The_Illicit_Trafficking_of_Counterfeit_Goods_and_Transnational_Organized_Crime.pdf.

U.S. Chamber of Commerce. Global Intellectual Property Center. *Measuring the Magnitude of Global Counterfeiting: Creation of a Contemporary Global Measure of Physical Counterfeiting*. Washington, DC: U.S. Chamber of Commerce, 2016. https://www.uschamber.com/sites/default/files/documents/files/measuringthemagnitudeofglobalcounterfeiting.pdf.

U.S. Chamber of Commerce, and Gallup Consulting. "Counterfeiting in the United States: Consumer Behavior and Attitudes." PowerPoint presentation, August 2007. http://dev.theglobalipcenter.com/wp-content/uploads/2013/01/uschambergallupconsumerperceptions.pdf.

U.S. Department of Homeland Security (DHS). U.S. Customs and Border Protection (CBP). *E-Commerce Strategy*, 0685–0218. Washington, DC: DHS, 2018. https://www.cbp.gov/sites/default/files/assets/documents/2018-Mar/CBP-E-Commerce-Strategic-Plan_0.pdf.

———. CBP. *Intellectual Property Rights: Fiscal Year 2012 Seizure Statistics*, 0172-0113. Washington, DC: DHS, n.d. https://www.cbp.gov/sites/default/files/documents/FY2012%20IPR%20Seizure%20Statistics_0.pdf.

———. CBP. *Intellectual Property Rights: Fiscal Year 2013 Seizure Statistics*, 0204-0714. Washington, DC: DHS, n.d. https://www.cbp.gov/sites/default/files/documents/ipr_annual_report_2013_072414%20Final.pdf.

———. CBP. *Intellectual Property Rights: Fiscal Year 2014 Seizure Statistics*, 1134-0915. Washington, DC: DHS, 2015. https://www.cbp.gov/sites/default/files/documents/IPR%20FY14%20Seizure%20Statistics%20Booklet_100515_spread_web.pdf.

———. CBP. *Intellectual Property Rights: Fiscal Year 2015 Seizure Statistics*, 0570-0916. Washington, DC: DHS, 2017. https://www.cbp.gov/sites/default/files/assets/documents/2017-Jan/2015%20IPR%20Annual%20Statistics.pdf.

———. CBP. *Intellectual Property Rights: Fiscal Year 2016 Seizure Statistics*, 0649-0917. Washington, DC: DHS, 2018. https://www.cbp.gov/sites/default/files/assets/documents/2018-Jan/FY2016%20IPR%20Seizure%20Statistics%20Book%20%28PDF%20Formatting%29_OT.pdf.

———. CBP. *Intellectual Property Rights: Fiscal Year 2017 Seizure Statistics*, 0785-0918. Washington, DC: DHS, 2019. https://www.cbp.gov/sites/default/files/assets/documents/2019-Apr/FY%202017%20Seizure%20Stats%20Booklet%20-%20508%20Compliant.pdf.

———. CBP. *Intellectual Property Rights: Fiscal Year 2018 Seizure Statistics*, 0917-0719. Washington, DC: DHS, 2019. https://www.cbp.gov/sites/default/files/assets/documents/2019-Aug/IPR_Annual-Report-FY-2018.pdf.

U.S. Government Accountability Office (GAO). *Intellectual Property: Agencies Can Improve Efforts to Address Risks Posed by Changing Counterfeits Market*, GAO-18-216. Washington, DC: GAO, 2018. https://www.gao.gov/assets/690/689713.pdf.

U.S. International Trade Commission (USITC). *Foreign Protection of Intellectual Property Rights and the Effects on U.S. Industry and Trade: Report to the United States Trade Representative, Investigation No. 332–245, Under Section 332(g) of the Tariff Act of 1930*, USITC Publication 2065. Washington, DC: USITC, 1988. https://www.usitc.gov/publications/332/pub2065.pdf.

U.S. Senate. *Hearing on Counterfeits and their Impact on Consumer Health and Safety, Before the Committee on the Judiciary*. 114th Cong., 2nd sess. April 27, 2016. https://www.hsdl.org/?view&did=799267.

Venhuis, Bastiaan J., Angela E. Oostlander, Domenico Di Giorgio, Ruth Mosimann Pharm, and Ines du Plessis. "Oncology Drugs in the Crosshairs of Pharmaceutical Crime." *Lancet Oncology* 19, no. 4 (2018): e209–e217. doi: 10.1016/S1470-2045(18)30101-3.

Wadleigh, John, Jake Drew, and Tyler Moore. "The E-Commerce Market for 'Lemons': Identification and Analysis of Websites Selling Counterfeit Goods." Proceedings of the 24th International Conference on World Wide Web, Florence, Italy, May 18–22, 2015, 1188–97. doi: 10.1145/2736277.2741658.

Weigmann, Katrin. "Elixirs of Death." *EMBO Reports: Science & Society* 14, no. 7 (2013): 597–600. doi: 10.1038/embor.2013.82.

Wilson, Jeremy M., Clifford Grammich, and Fiona Chan. "Organizing for Brand Protection and Responding to Product Counterfeit Risk: An Analysis of Global Firms." *Journal of Brand Management* 23, no. 3 (2016): 345–61. doi: 10.1057/bm.2016.12.

Wilson, Jeremy M., Brandon A. Sullivan, and Meghan E. Hollis. "'Measuring the Unmeasurable': Approaches to Assessing the Nature and Extent of Product Counterfeiting." *International Criminal Justice Review* 26, no. 3 (2016): 259–76. doi: 10.1177/1057567716644766.

In addition to these references, the research team looked at agency websites, particularly those for the Organisation for Economic Co-operation and Development, U.S. Department of Homeland Security, U.S. Patent and Trademark Office, and World Bank; industry platforms, such as Alibaba, Amazon, eBay, and Facebook; industry groups (e.g., American Association of Advertising Agencies, Ghost Data, Red Points, and the Trustworthy Accountability Group); and reputable news outlets, including *Forbes*, the *Harvard Business Review*, *Investopedia*, the *St. Louis-Post Dispatch*, and *Vox.*