JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS Vol. 58, No. 5, Aug. 2023, pp. 2024–2063

doi:10.1017/S0022109022001387

Fake Products, Real Effects: Evidence from Special 301 Actions

Mehmet I. Canayaz
Smeal College of Business Pennsylvania State University
mcanayaz@psu.edu

Umit G. Gurun
Jindal School of Management University of Texas at Dallas
umit.gurun@utdallas.edu (corresponding author)

Abstract

We study how the U.S. government's anti-counterfeiting enforcement actions through Special 301 Reports influence U.S. businesses. We show that anti-counterfeiting enforcement in foreign countries improves U.S. firms' sales, profitability, and valuations. Firms significantly reduce capital and research and development investments when their brands and products are protected from counterfeiting activities. Anti-counterfeiting enforcement measures also improve brand asset value, brand profitability, brand inventiveness, market penetration, and customer loyalty.

I. Introduction

Counterfeiting is not only a widespread and long-standing problem but also growing in scope and magnitude.[1] According to the Organisation for Economic Co-operation and Development (OECD), trade in counterfeit goods went up from 1.9% of global trade to 3.3% between 2008 and 2019. The International Chamber of

We thank Geoffrey Booth, Zeynep Gurhan Canli, Lauren Cohen, Tony Cookson, Jess Cornaggia, Kimberly Cornaggia, Bill Cready, Mara Faccio (the editor), Cesare Fraccassi, Benjamin Golez, John Griffin, Matthew Gustafson, Davidson Heath, Peter Iliev, Robert Kieschnick, Chris Malloy, Bugra Ozel, Chris Parsons, David Solomon, Eugene Soltes, Noah Stoffman, Andrew Toole, Kevin Tseng (discussant), Scott Yonker, and Alminas Žaldokas for their comments. We are especially grateful to an anonymous referee who provided numerous insightful comments. We also thank conference participants at the 2019 Northwestern/USPTO conference, the 2019 American Law and Economics Association Meeting at NYU, the 2019 Conference on the Convergence of Financial and Managerial Accounting Research as well as seminar participants at Baylor University, the University of Texas at Dallas, and Koc University. We thank BAV Consulting for sharing their data on brands, and Tom Kubic, Zarek Shaikh, and the Pharmaceutical Security Institute for sharing their data on pharmaceutical enforcement actions. All errors are ours.

[1]The World Trade Organization (WTO) defines counterfeiting as an unauthorized representation of a registered trademark carried on goods identical or similar to goods for which the trademark is registered, with a view to deceiving the purchaser into believing that he/she is buying the original goods. See, for example, the definition of "counterfeit" at https://bit.ly/3dmZ0Db. U.S. government agencies follow the WTO's widely-disseminated definition with some nuances, resulting, for example, in the inclusion of piracy in U.S. anti-counterfeiting enforcement efforts. See, for example, Spink, Moyer, Park, and Heinonen (2013).

Commerce (ICC) predicts that sales of counterfeit products could reach $4.2 trillion by 2022.[2] The U.S. government actively monitors developments in and engages with, countries that provide a fertile ground for counterfeiters. In Special 301 Reports, the United States Trade Representative (USTR) highlights the counterfeiting-related problems U.S. businesses face in foreign countries and provides detailed action plans. Anecdotal evidence suggests that Special 301 Reports help the U.S. combat counterfeiting because foreign governments often comply with the USTR's action plans to avoid trade sanctions. Nevertheless, the academic literature is yet to provide large-scale evidence on how Special 301 Reports impact business outcomes.

In this article, we explore how the U.S. government's anti-counterfeiting enforcement actions through Special 301 Reports impact U.S. businesses. We conduct our investigation in 2 steps. We start by analyzing the influence of counterfeiting on U.S. firms' foreign segment sales by using a novel data set we compiled from the USTR's Special 301 Reports. We then supplement these findings by exploiting a data set provided to us by BAV Consulting (BAV) that contains proxies for brand asset value, brand profit margin, market penetration, customer loyalty, and brand awareness at the firm-country-year level. This data allows us to shed light on whether anti-counterfeiting enforcement actions help U.S. firms maintain their reputations, penetrate new markets, acquire new customers by raising customer awareness, and charge premium prices through stronger brand differentiation or customer loyalty.[3]

Since Special 301 enforcement actions are nonexcludable (i.e., non-U.S. firms are also affected) and nonrival in consumption (i.e., their use by U.S. firms does not reduce their availability for non-U.S. firms), they can also affect non-U.S. firms that operate in targeted countries. The effects of Special 301 actions on these firms will likely depend primarily on how enforcement actions affect business activities in general. That said, U.S. enforcement actions can harm non-U.S. firms that benefit from their U.S. competitors being targeted by counterfeiters. Additionally, given China's importance as a major source of production, the scrutiny of enforcement in China can influence counterfeit sales in other regions. Counterfeiting in other countries may rise or fall depending on the nature of enforcement in China (e.g., whether they target domestic sales and/or exports) and scrutiny of enforcement in alternative markets. Our article features heterogeneity tests that provide empirical evidence on the net effects of Special 301 enforcement on non-U.S. firms in targeted countries and how enforcement efforts in China influence U.S. firms operating in other countries.

In the second step of our investigation, we shift our attention from segment-level analyses to firm-level analyses. More specifically, we examine the ramifications

[2]See https://bit.ly/3aXga8E for the OECD's report on counterfeiting.

[3]Bronnenberg, Dubé, and Moorthy (2019) provide an excellent overview of the economics of branding. See also, Klemperer (1995) and Farrell and Klemperer (2007) on brand loyalty; Brynjolfsson and Smith (2000), Ailawadi, Lehmann, and Neslin (2003), and Bronnenberg, Dubé, Gentzknow, and Shapiro (2015) on brand profit margin; Hitsch (2006), Goldfarb, Le, and Moorthy (2008), and Borkovsky, Goldfarb, Haviv, and Moorthy (2017) on market penetration; and Doraszelski and Markovich (2007) and McDevitt (2014) on brand awareness.

of Special 301 enforcement on publicly traded U.S. firms. To do so, we develop a measure of exposure to counterfeiting activities around the world at the firm-year level, and we use this measure to explore how changing counterfeiting exposure due to the USTR's anti-counterfeiting enforcement efforts impacts firm-level outcome variables such as investment, profitability, and value.

The effects of counterfeiting on business outcomes are far from obvious. Counterfeit products that increase competition for the same consumer base, or yield a "substitution effect" as in Qian (2014a), can pose a threat to firm and brand values. Under the presence of information asymmetries, deceptive counterfeits can disincentivize genuine producers from producing high-quality products and hurt their reputations (Grossman and Shapiro (1988a), (1988b)).[4] Conversely, genuine producers can benefit from counterfeit products due to an "advertising effect." This can happen, for example, if consumers of counterfeits later become customers of authentic products (Qian (2014a), (2014b)).[5] Which of these effects prevails and how anti-counterfeiting efforts influence businesses are open questions.

To test the empirical predictions of these theoretical arguments, we study the information contained in Special 301 Reports. In these reports, the USTR publishes a list of countries with varying degrees of counterfeiting-related violations. The USTR categorizes these countries into two main groups, Priority Watch List and Watch List, depending on the severity of violations faced by U.S. businesses. Throughout our article, we follow USTR's designations and use watch list status as a proxy for the level of counterfeiting in a given country, and we attribute getting delisted or downlisted (listed or uplisted) in Special 301 Reports to stronger (weaker) anti-counterfeit enforcement.

Our empirical approach makes inferences based on the comparison of firm-segment outcomes in a given year across foreign countries with varying counterfeiting and enforcement characteristics. We start our analyses by investigating how U.S. firms' sales in foreign markets are affected by counterfeiting. We find that publicly traded U.S. firms exhibit up to 8.39% lower sales in countries that are included on the Special 301 Priority Watch List and 3.16% lower sales in countries that are included on the Special 301 Watch List.[6] We complement these findings by investigating the relationship between counterfeiting and brand image. BAV data indicate that publicly listed U.S. firms exhibit up to 2.55% lower brand asset values in foreign countries that are included on the Special 301 Watch List. The reduction in brand asset values reaches 5.07% in the countries included on the Special 301 Priority Watch List.

[4]Interestingly, firms can still be worse off even if consumers can distinguish counterfeit products from real ones because of the status value of the brands. When the status value of a product depends negatively on the number of consumers who own a product, genuine or fake, bearing the same brand name, consumers are willing to substitute the real products with the deceptive counterfeits and therefore hurt producers of the genuine goods (Grossman and Shapiro (1998b)).

[5]The advertising effect could also arise if imitation by counterfeits serves as a signal for the high quality of the original product (Biais and Perotti (2008), De Castro, Balkin, and Shepherd (2008)), or if consumer utility from a product is an increasing function of the size of the user base (Conner and Rumelt (1991), Khan (2004)).

[6]Both of these figures are calculated relative to the sample mean.

BAV's detailed data on brand metrics allow us to delve deeper into potential channels through which counterfeiting can hurt brands. We pin down statistically significant deteriorations in brand profit margin, market penetration, customer loyalty, brand awareness, and brand inventiveness with estimates ranging from −2.06% to −3.16% in Priority Watch List countries. Declining firm sales and brand values are therefore complemented by reductions in brand profitability, difficulty retaining customers, and difficulty entering new markets. An array of BAV metrics related to innovation also deteriorate, which suggests that a firm's future products can be influenced by counterfeits in addition to its existing products.

Does anti-counterfeiting enforcement help brand metrics? We find that stronger anti-counterfeiting enforcement in a foreign country increases brand asset value contemporaneously by 0.80%, profit margin of brands by 0.63%, market penetration by 0.96%, customer loyalty by 0.65%, and brand awareness by 0.79%. These results are robust to a wide array of fixed effect structures, including industry-year, firm-country, and firm-year fixed effects, and they highlight the importance of the U.S. government's anti-counterfeiting enforcement for U.S. brands.

In our heterogeneity tests, we show that non-U.S. brands also suffer when they are exposed to counterfeiting activities in watch-listed countries, and their brand values also benefit from U.S. anti-counterfeiting enforcement. Furthermore, stronger anti-counterfeiting enforcement efforts in China are associated with worsening counterfeiting challenges for U.S. brands in other countries listed in Special 301 Reports. In particular, when there are stronger enforcement efforts in China, brand assets of U.S. firms deteriorate by 3.07% (3.73%) in (Priority) Watch List countries relative to countries that are not watchlisted by the USTR. These findings suggest that stronger enforcement efforts in China deteriorate brand assets in countries with preexisting counterfeiting problems. Additional analyses on brand metrics underline that U.S. firms' reputations for retaining customers and producing innovative products also deteriorate.

To investigate the relationship between counterfeit exposure and firm performance, we combine information on the number of customers to whom a firm can sell in the niche in which it is operating and the level of anti-counterfeiting enforcement in that country. Using this metric, we show that for a given firm, a *positive* change in anti-counterfeiting enforcement in a foreign country with 100 million firm customers is associated with a 0.22% *decrease* in capital expenditures and a 0.15% *decrease* in R&D expenditures. Such a change is also associated with an *increase* in the firm's profit margin of 0.24% and an *increase* in firm value of up to 3.23%.

Collectively, our findings suggest that firms exposed to counterfeiting problems in foreign countries observe weaker foreign segment sales and deterioration in brand asset value. Our tests on brand profit margin, market penetration, customer loyalty, brand awareness, and brand inventiveness provide insights on the channels through which U.S. brands can observe deterioration. Stronger anti-counterfeiting enforcement through Special 301 actions is associated with appreciation of the brand and firm values of publicly traded U.S. firms. We corroborate our findings on enforcement by showing how Special 301 actions result in the establishment of new intellectual property (IP) offices in foreign countries, and – in the case of the

pharmaceutical industry – more police raids that lead to the confiscation of counterfeit drugs.

We contribute to the literature in four unique ways. First, we provide the first large-scale analysis of the ramifications of Special 301 actions on U.S. businesses. Second, by exploiting a novel data set on brands, we provide evidence on how counterfeiting problems and anti-counterfeiting enforcement efforts influence brand profitability, market penetration, and customer loyalty. Third, we provide a wide array of heterogeneity tests that shed light on how non-U.S. businesses are influenced by U.S. anti-counterfeiting enforcement and how segment sales in countries with varying counterfeiting challenges are influenced by enforcement in China. Finally, we introduce 2 new data sets to the literature to be used by future studies focusing on counterfeiting and metrics related to brand value.

The remainder of the article is organized as follows: Section II presents the literature review. Section III introduces our data and presents summary statistics. Section IV discusses our research design, and Section V presents our main findings. Section VI presents additional analyses, and Section VII concludes the article. We present additional findings in the Supplementary Material to keep the main text concise.

II. Literature Review

Theoretical predictions are mixed as to whether counterfeiting has a positive or negative net effect on genuine producers. Counterfeiting can distort sales of genuine producers when consumers get deceived by counterfeit products or recognize a risk of deception related to a firm overall (Grossman and Shapiro (1998b)). In contrast to this "substitution effect," if counterfeiters and genuine producers do not compete for the same consumer base and consumers of counterfeits later become customers of authentic products, counterfeits can promote genuine producers due to an "advertising effect" (Qian (2008), (2014a), (2014b)).

In line with the substitution effect, counterfeits can distort brand value and customer loyalty, since consumers who purchase counterfeits may not recognize them as such and attribute poor performance to genuine producers (Grossman and Shapiro (1998b), Bronnenberg et al. (2015)). Counterfeiting risks can make it harder for firms to penetrate into new markets, acquire new customers, and charge premium prices through brand differentiation (Braithwaite (1928), Chamberlin (1933), and Bain (1956)). Firms that expect strong competition from counterfeits may choose to innovate less and therefore fail to produce high-quality products (Akerlof (1970), Dubin (1998)).[7] Conversely, in line with the advertising effect, counterfeits can improve the above brand metrics if imitation serves as a signal for the quality of a firm's products (Biais and Perotti (2008), De Castro et al. (2008)) or if consumer utility from a firm's products is an increasing function of the size of the user base (Conner and Rumelt (1991), Khan (2004)).[8]

[7]Interested readers can refer to Arrow (1962), Aboody and Lev (1998), Lev ((2000), (2018)), Barth, Kasznik, and McNichols (2001), Kothari, Laguerre, and Leone (2002), Eberhart, Maxwell, and Siddique (2004), (2008), and Guo, Lev, and Zhou (2004) for research on intangible assets.

[8]Several studies in the marketing literature argue that demand for counterfeits can be explained by lower prices, attitudes toward branded companies, and the need for status signaling (Bloch, Bush, and

The theoretical effect of counterfeit products on corporate investment is ambiguous as well. If the threat of counterfeiting reduces growth opportunities and increases the uncertainty of future projects, genuine producers may choose to invest less (Fudenberg and Tirole (1984)). Conversely, genuine producers may choose to fight against infringing short-term contesters by taking a more aggressive investment approach (Caves and Porter (1977), Qian (2008), (2014a), (2014b), and Raustiala and Springman (2012)).[9] Under this scenario, successful anti-counterfeiting enforcement may eliminate contesters and result in lower investments (Baumol (1982)).

For all of the above reasons, the net effect of counterfeiting on firm value is far from obvious. Counterfeiting can have a positive or negative effect on a firm's income as well as its investment rate and return on invested capital, both of which drive firm growth. The net effect of counterfeiting on drivers of firm value will likely depend on which of the substitution and advertising effects dominate and how firms and governments respond to product market competition by counterfeit products.[10]

III. Data and Descriptive Statistics

This section provides descriptive statistics on the data used in our empirical analyses. We start by presenting our novel data on Special 301 actions and brand value metrics in Sections III.A and III.B. Section III.C presents descriptive statistics on financial metrics and firm-level exposure measures to counterfeiting dynamics around the globe.

A. Special 301 Reports

In Special 301 reports, the USTR lists the foreign countries that deny adequate and effective protection of IP rights or deny fair and equitable market access to U.S. persons that rely upon IP protection. We hand-collect listings from all Special

Campbell (1993), Wee, Tan, and Cheok (1995), Cordell, Kieschnick, and Wongtada (1996), Tom, Garibaldi, Zeng, and Pilcher (1998), Kwong, Yau, Lee, Sin, and Tse (2003), Wilcox, Kim, and Sen (2009), and Han, Nunes, and Dreze (2010)). There are also studies that look at the supply-side effects such as those of Conner and Rumelt (1991) and Olsen and Granzin (1992). See also Shapiro (1983), who studies how brand premium helps compensate sellers for their investment in reputation, and Klein and Leffler (1981), who show how a price premium serves as a quality assurance mechanism.

[9]Qian (2008) evaluates the impact of counterfeiting on sellers of authentic goods under weak anti-counterfeiting enforcement in the footwear industry in China between 1993 and 2004 and shows that counterfeit entry stimulates the original producer to offer a higher-quality product at a higher price. Qian (2014a) predicts that entry by counterfeiters would induce a genuine producer to upgrade product quality and raise its product's price if and only if the entrant's quality is lower than a threshold level. Fink, Maskus, and Qian (2016) provide an excellent survey of the literature on the effects of counterfeiting and piracy in the economy.

[10]A host of papers examine how the investment behavior of an incumbent firm changes when new entrants or short-term contesters penetrate a market and alter the intensity of the product market competition (Baumol (1982), Sundaram, John, and John (1996), Akdogu and MacKay (2008), Hoberg and Phillips (2010), (2016), Giroud and Mueller (2011), Hoberg, Phillips, and Prabhala (2014), and Stoughton, Wong, and Yi (2017)). Yet there is little empirical evidence on how useful government enforcement efforts are for deterring product market competition coming from infringing entities in foreign countries, how firms alter their investments in such cases, or whether enforcement efforts are value-enhancing for firms.

301 Reports published on the official USTR website. Between 1993 and 2014, the USTR issued 967 Special 301 listings. In these listings, the USTR categorized 91 countries as Priority Foreign Countries (PFC), Priority Watch List Countries (PWL), or Watch List Countries (WL).[11] All of these assessments were made on a case-by-case basis, taking into account diverse factors such as the production of counterfeit goods, exposure to the global dissemination of counterfeit goods, levels of IP rights development, international obligations and commitments, the concerns of rights holders and other interested parties, and the trade and investment policies of the United States.

The USTR identifies PFCs as those countries that have the most onerous or egregious acts, policies, or practices and whose acts, policies, or practices have the greatest adverse impact (actual or potential) on the relevant U.S. products. To further facilitate the administration of related statutes, the USTR also uses the Priority Watch List and the Watch List for the second and third tiers of countries with anti-counterfeiting enforcement problems. Placement on these lists indicates that particular problems exist in a given country with respect to IP protection, enforcement, or market access for persons relying on IP. For each listing, the USTR provides detailed explanations of counterfeiting problems.

Table 1 reports the total number of Special 301 listings and categorizations for each year in our sample period. The USTR listed, on average, around 44 countries per year between 1993 and 2014, ranging from 18 in 1993 to 59 in 2000. In so doing, it identified about 12 countries as PWL and 30 countries as WL on average. Columns 7 and 8 of Table 1 provide information on the countries with stronger and weaker enforcement efforts against counterfeits relative to the previous calendar year (i.e., STRONGER_ACE and WEAKER_ACE countries). In a given year, there are 6.55 WEAKER_ACE countries – that is, countries that have been dropped to a worse Special 301 category (e.g., from PWL to PFC, or from WL to PWL/PFC, or from Not Listed to WL/PWL/PFC), and 6.27 STRONGER_ACE countries (i.e., countries that have been raised to a better Special 301 category). The majority of the changes in Special 301 status are one-step changes in which a country moves from a PWL status to a WL status (or the reverse) or from a WL status to a Not Listed status (or the reverse).

Figure 1 contains a world map showing the number of times each foreign country was listed in Special 301 Reports during our sample period. As shown on the map, northern and western European countries exhibit the fewest Special 301 listings, and eastern European, Asian, and Latin American countries exhibit the most listings. France and the United Kingdom have never been listed, and Germany has been listed only once.[12] The countries that were listed most frequently are Russia, Brazil, Turkey, Canada, and China.[13] Each of these countries was listed more than 20 times in Special 301 Reports between 1993 and 2014.

[11] In addition to these categorizations, in rare cases, the USTR also performs out-of-cycle reviews for countries that require further monitoring in addition to the annual review cycle and Section 306 monitoring for countries with which the United States has bilateral agreements to address specific problems raised in earlier reports.

[12] European Union countries negotiate Special 301 provisions with the United States individually (i.e., not collectively).

[13] The narrative used in Special 301 Reports often coincides with media reports. In 2006, the Special 301 Report contains the following excerpt on Canada regarding the nature of counterfeits that penetrate

TABLE 1

The USTR's Special 301 Reports

Table 1 presents important information on Special 301 listings. It shows the total number of Special 301 listings, watch list designations, reported counterfeit issues, mentioned sectors and subsectors, and the lengths of country analyses. PFC denotes Priority Foreign Countries, PWL denotes Priority Watch List Countries, WL denotes Watch List Countries, and 306/OCR denotes Section 306 and out-of-cycle reviews. Weaker ACE refers to anti-counterfeiting enforcement getting worse (e.g., WL to PWL) relative to the previous calendar year. Stronger ACE refers to anti-counterfeiting enforcement getting better (e.g., PWL to WL) relative to the previous calendar year. Counterfeit issues denote the percentage of Special 301 listings that cite troubles related to counterfeiting problems. Related sectors and subsectors denote industries that are cited in Special 301 Reports as troubled industries in corresponding foreign countries. To identify them, we use BAV's sector and subsector definitions. Length of country analysis denotes the number of characters each Special 301 listing contains.

Year	Total Listings	PFC	PWL	WL	306/ OCR	Weaker ACE	Stronger ACE	Counterfeit Issues (%)	Related Sectors	Related Subsectors	Length of Country Analysis
1993	18	3	10	5	0	3	17	22.22	0	0	210.22
1994	24	0	6	18	0	13	11	45.83	2	2	473.29
1995	32	0	8	24	0	12	4	43.75	3	4	609.53
1996	34	1	8	25	0	8	5	58.82	3	8	711.35
1997	47	0	10	36	1	18	4	67.39	3	8	770.50
1998	48	1	15	31	1	12	5	72.34	5	10	1,060.89
1999	57	0	16	37	4	14	6	69.81	4	8	1,126.76
2000	59	0	16	39	4	12	11	80.00	4	6	1,166.46
2001	55	1	16	32	6	11	15	79.59	6	14	1,268.63
2002	51	1	15	33	2	4	5	71.43	3	4	1,251.78
2003	50	1	11	36	2	5	10	77.08	6	18	1,414.90
2004	52	1	15	34	2	7	1	84.00	9	21	1,861.40
2005	52	1	14	36	1	3	4	82.35	9	21	2,326.59
2006	48	0	13	34	1	1	8	80.85	10	24	2,178.94
2007	43	0	12	29	2	2	9	87.80	5	8	1,781.07
2008	46	0	9	36	1	7	6	82.22	5	8	1,737.20
2009	47	0	12	33	2	5	2	80.00	6	10	1,616.09
2010	41	0	11	29	1	0	5	85.00	5	8	1,678.85
2011	42	0	12	29	1	1	0	80.49	11	17	2,082.76
2012	40	0	13	26	1	1	2	82.05	2	2	2,273.33
2013	43	1	10	30	2	5	4	80.49	2	2	2,297.27
2014	38	0	10	27	1	0	4	72.97	1	1	2,699.27
Mean	43.95	0.50	11.91	29.95	1.59	6.55	6.27	72.11	4.73	9.27	1,481.69
Sum	967	11	262	659	35	144	138				

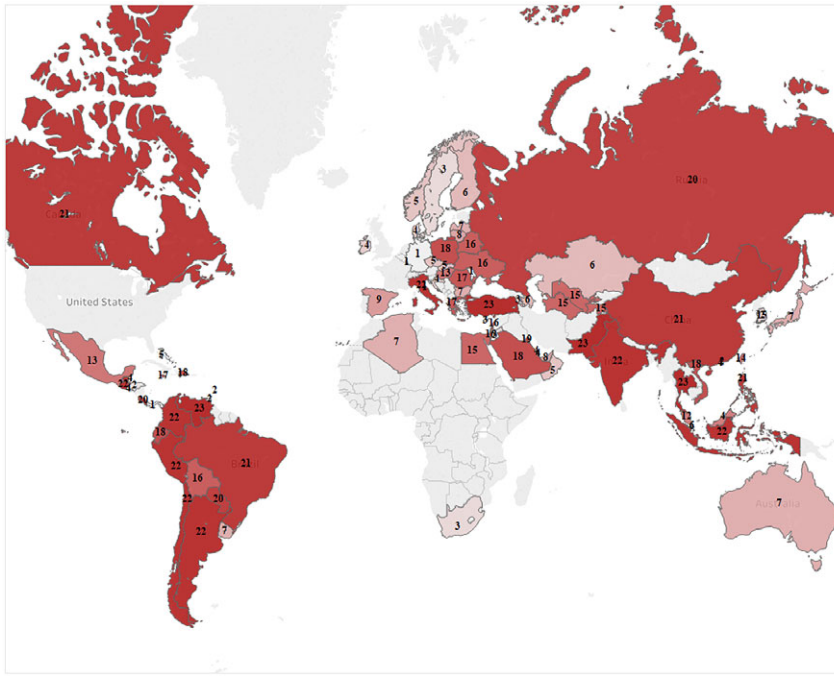
Special 301 Reports provide information on the severity of counterfeit activity across industries and detailed explanations of which U.S. industries are adversely affected by harmful activities in the subject countries. After reading these reports, we identify the U.S. industries that were behind each of the 967 listings between 1993 and 2014. We link each Special 301 listing decision with U.S. industries on a case-by-case basis to create a database that helps us delineate industries/firms that lobbied the USTR. Doing so allows us to identify industries that do not lobby for, but that benefit from, anti-counterfeiting enforcement triggered by Special 301 Reports. In a given year, the USTR identifies an average of 4.95 U.S. industries

into the United States and what can be done to address counterfeiting: "systemic inadequacies in Canadian administrative and judicial procedures continue to allow the early and often infringing entry of generic versions of patented medicines into the marketplace. Enforcement against IP infringement improved through a concerted government and industry effort to address radio signal theft, but these renewed efforts did not carry over into other areas of counterfeiting and piracy… Canada's border measures continue to be a serious concern for IP owners, who consider Canada's border enforcement measures to be inconsistent with its TRIPS obligations. The United States urges Canada to take effective measures to strengthen border enforcement, including the enactment of legislation that would allow - Canada's customs officials to conduct ex officio searches of incoming and outgoing products suspected to be pirate or counterfeit."

FIGURE 1

Distribution of Special 301 Listings of Each Country

Figure 1 reports the number of Special 301 listings of each country between 1993 and 2014. The number on each country denotes the number of listings. Darker shading indicates more listings.



and 9.71 U.S. subindustries as being affected by counterfeit products in foreign countries.[14]

Figure 2 records a subsample of the industries mentioned in Special 301 Reports by the USTR as industries that are exposed to counterfeit activities. It shows which industries are exposed to counterfeit products and where. As shown by the maps, U.S. firms in the "Book and Music Retailers," "Pharmaceuticals," "Computers & Software," and "TV/Movie/Radio" sectors are affected by counterfeit products across a wide range of foreign countries. In contrast, U.S. firms in such sectors as "Print Media," "Food," "Beverages – Nonalcoholic," and "Footwear" are exposed to counterfeits in only a handful of countries, including Canada, Turkey, China, Russia, and Egypt.

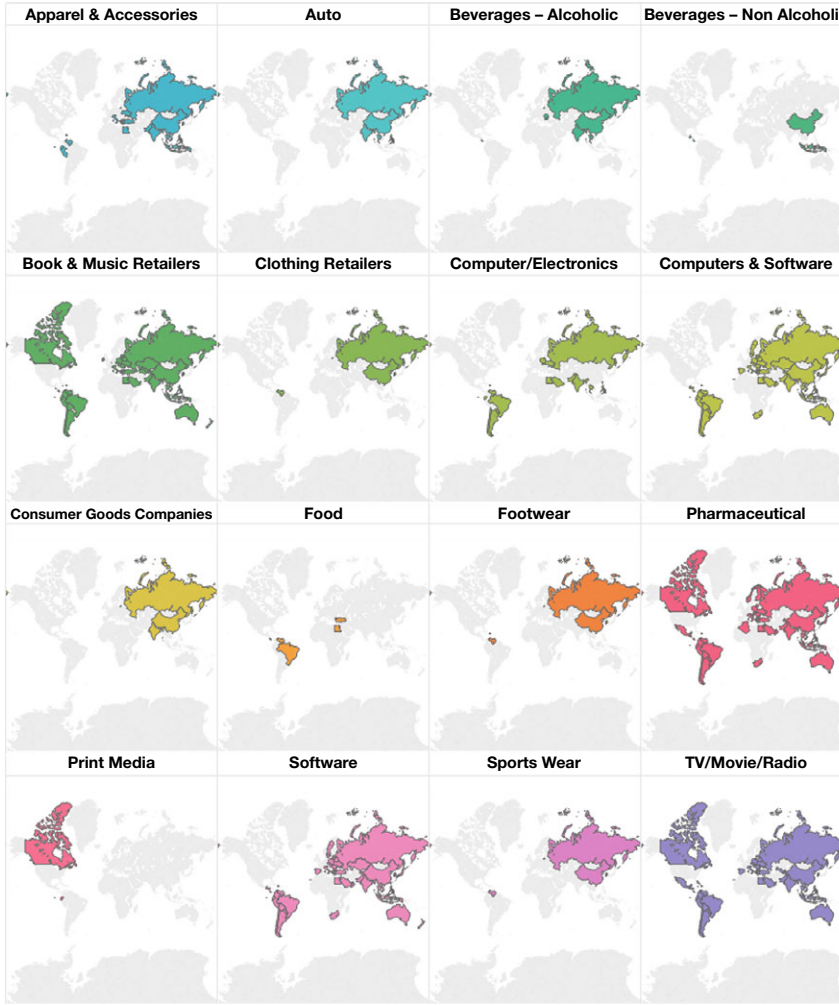
The USTR presents detailed remarks on all Special 301 listings. In these remarks, it outlines the status of the counterfeit economy in each country (i.e., the sectors with counterfeit issues, the locations and conditions of notorious markets, and how each foreign country tackles and should tackle counterfeiting problems). The reports further explain why a given foreign country is listed, what it

[14]We drop segments in countries that are in 306 status – that is, countries that are mentioned in Special 301 Reports but not watch-listed – because it is not clear whether these countries are similar to those that are treated or not treated by the watch list designation.

FIGURE 2

Sector-Level Exposure to Counterfeits

Figure 2 reports the counterfeiting problems related to selected sectors. It shows the countries that are linked with counterfeit products in each sector at least once by the USTR during the sample period of 1993 to 2014. Sectors are defined as in the BAV data set.



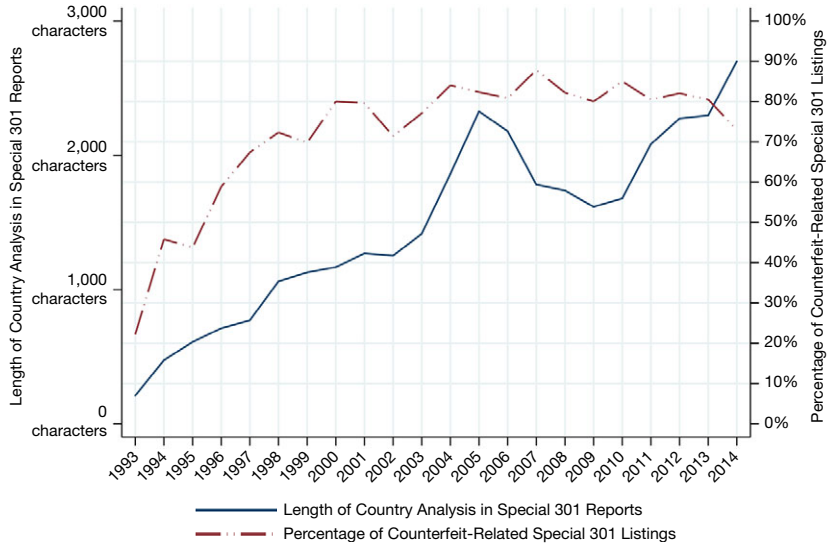
should do to get unlisted, and what would happen if there were not enough progress or no action taken. Examples of suggested actions include opening IP offices, signing new free trade agreements with stronger IP protections, passing new legislation against counterfeits, jailing the guilty parties, or educating judges on anti-counterfeiting rules.[15]

[15]In the Supplementary Material, we provide detailed information on a few recent Special 301 Reports.

FIGURE 3

Country Remarks and Counterfeiting Problems over Time

Figure 3 presents the average length of Special 301 country remarks written by the USTR and the percentage of Special 301 listings that are related to counterfeit issues for each year in our sample period. The lengths of Special 301 country remarks are measured by the number of characters. Our sample period is from 1993 to 2014.



In Figure 3, we show how country report length changes and how often counterfeiting violations are raised by the USTR year by year. Based on our textual analysis, 72% of Special 301 listings were associated with issues related to counterfeit products between 1993 and 2014. This number reached 80% during the second half of our sample period, highlighting the increase in the rate of counterfeiting violations registered in Special 301 Reports over time.

The USTR's listings are often triggered by unauthorized representation of registered trademarks that target and deceive consumers. Under these circumstances, consumers are receiving inferior products being labeled as genuine. Nonetheless, other circumstances may exist in which identical or noninferior products are sold off at cheaper prices and without deceiving customers (e.g., the resale of stolen medicines and unauthorized photocopying of books). In these cases, since consumers are not deceived and the quality of the fake product is on par with the genuine product, the substitution effect can be less prevalent. That being said, if customers of genuine brands do perceive these violations as a weakness of the genuine brand, the substitution effect may be more prevalent, particularly its impact on customer attrition and profit margin proxies.

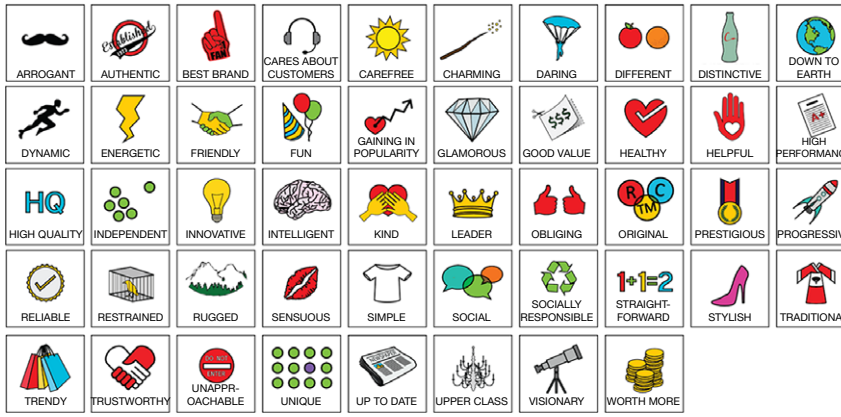
B. Brand Value Characteristics

In this section, we provide detailed summary statistics for the brand data we utilize in our empirical analyses. Our brand data is provided by BAV, and it contains

FIGURE 4

BAV's Brand Attributes

Figure 4 presents the imagery for brand attributes used in BAV surveys around the globe. Using proprietary formulas, BAV clusters these attributes into 4 measures that proxy for profit margin, product market penetration, customer loyalty, and brand awareness. BAV then creates a brand asset value score using these 4 measures.



responses to annually conducted surveys between 1993 and 2014 around the world.[16] In these surveys, respondents are asked about 48 dimensions of brands that are referred to as "image attributes" in the marketing industry (see Figure 4). When, for example, respondents evaluate the Aeropostale brand on BAV's image attribute Prestigious, respondents are asked to answer yes or no to the following question: "Do you find Aeropostale to be prestigious?" Aeropostale then receives a score on the image attribute Prestigious, determined by the percentage of respondents who associate it with being prestigious. Scores of Aeropostale and other firms for each attribute are then ranked so that the top-scoring firm in a particular attribute gets a score of 100 for that attribute.

BAV clusters image attributes and supplementary survey questions into four main categories that we use to proxy for profit margins, product market penetration, customer loyalty, and brand awareness. BAV calls these categories i) energized differentiation, ii) relevance, iii) esteem, and iv) knowledge, respectively.

Energized differentiation is a brand's point of difference, and it is calculated using a composite of 5 image attributes: Different, Distinctive, Unique, Innovative, and Dynamic. This metric is intended to proxy for the profit margin of the brand.[17] Relevance is a proxy for how relevant a brand's products are for consumers, and it is calculated based on a scale of 1–7 from the usage preference measures "Not at All Relevant" to "Extremely Relevant." This metric is a proxy for the product market penetration of the company. Esteem measures how well-regarded the brand is, and it is calculated on a scale of 1–7 from "Extremely Low Regard" to "Extremely High Regard" and weighted with a combination of 3 attributes: Leader, Reliable, and

[16]See Larkin (2013) for a different use of the BAV database.

[17]In untabulated results, we compare BAV's firm-level profit margin proxy with actual firm-level profit margin and confirm its validity. These results are available upon request.

High Quality. BAV aims to measure customer loyalty with the esteem category. The knowledge category, which aims to measure brand awareness, focuses on consumers' intimate understanding of a firm's brand, and it is calculated based on a scale of 1–7 from "Never Heard of" to "Extremely Familiar." All of these metrics are later mapped into a score between 0 and 100. BAV uses these 4 components to compute a final composite Brand Asset Value for each firm. In addition to these metrics, we also use BAV's construct "cutting edge" – a linear combination of the BAV image attributes Innovative, Dynamic, and Progressive – to proxy for brand inventiveness.[18] Innovative proxies how successful a firm is in creating new products, Dynamic proxies how often a firm produces new products, and Progressive proxies how successful a firm is in improving products.

BAV's pooled data set contains 41,988 unique brand identifiers and 273,948 observations at the brand-country-year level. BAV's identifiers uniquely classify not only firms but also celebrities, TV programs, politicians, countries, and products.[19] Importantly, BAV's data set does not contain firm identifiers previously used in the literature, and its data on products are not mapped to firms. Since the majority of BAV's product data (their closest data to the stock-keeping unit) is concentrated on consumer-goods firms, we decide to manually merge the BAV data on firms with the COMPUSTAT universe and study the brand data at the firm level. To that end, we scan the brand names related to the 41,988 brand identifiers one by one, and we search for these names in the COMPUSTAT universe. In so doing, we create a linking table that maps BAV identifiers to 637 unique U.S. firm identifiers, 242 of which belong to U.S. firms with brand data outside the United States.[20] We also identify 1,352 non-U.S. brands that satisfy the condition of having data in countries other than the United States. In linking these data sets, we make sure that firm identifiers are linked with the most reasonable brand name available (e.g., we do not link firm identifiers to BAV data on a product or a firm subsidiary).

In Panels A and B of Table 2, we report summary statistics on key brand metrics for 1,594 firms (242 public U.S. firms and 1,352 non-U.S. brands) for the period 1993 to 2014 across 28 foreign countries. For the public U.S. firms, the average brand asset score is 54.21, and the median score is 54.64. The average (median) score is 56.05 (59.00) for brand profit margin, 50.75 (50.49) for product market penetration, 59.15 (63.08) for customer loyalty score, and 48.96 (47.10) for brand awareness score. The brand usage (i.e., the percentage of consumers who actively use the brand) has a mean of 16.41% and a median of 7.54%. The brand characteristics of foreign firms are similar to those of public U.S. firms.

[18]We examine BAV metrics Innovative, Dynamic and Progressive separately as well. Those results are presented in Table A.I of the Supplementary Material.

[19]A sector-level tabulation of the pooled data, for example, reveals that food products (41,222 observations), health and beauty products (23,796 observations), and apparel and accessories (18,775 observations) contain the most observations.

[20]The number of observations drops from 273,948 to 46,969 when we only keep COMPUSTAT firms, from 46,969 to 31,464 when we drop U.S. surveys, and from 31,464 to 28,541 when we drop firms with fewer than five surveys.

TABLE 2
Summary Statistics

Table 2 reports summary statistics for our sample. We provide the number of observations, mean, median, and standard deviation along with values at the 5th and 95th percentiles. Panel A presents data from BAV on the brand characteristics of publicly traded U.S. firms, Panel B presents data from BAV on the brand characteristics of all firms except publicly traded U.S. firms, and Panel C presents data from Thomson Reuters Worldscope on the foreign-segment activities of publicly traded U.S. firms. Panel D reports the financial characteristics of publicly traded U.S. firms using data from CRSP-COMPUSTAT, and Panel E reports the firm-level counterfeiting exposure of publicly traded U.S. firms using data from the merged BAV-CRSP-COMPUSTAT universe. Our sample period is 1993 to 2014. In Panel A, log(SEGMENT_SALES) denotes log firm sales in a foreign country, log(SEGMENT_ASSETS) denotes log firm assets in a foreign country, and log(SEGMENT_CAPEX) denotes log firm capital expenditures in a foreign country. These variables are computed using ITEM19600 to ITEM19690. SALES-BASED_SEGMENT_HHI denotes the Herfindahl–Hirschman index, which is computed yearly in every foreign segment at the industry level (using Fama–French 48 industries) using sales. Descriptions of brand attributes for Panels B and C are in Section III and in the Supplementary Material. In Panel D, log(TOBINS_Q) is equal to log book value of assets plus market equity minus book value of equity, divided by book value of assets. log(MARKET_TO_BOOK) is end-of-calendar-year market capitalization over book value of equity, logged. log(AVEBITDA) is the log of the sum of end-of-calendar-year market capitalization, long-term debt, debt in current liabilities, cash, and short-term investments, divided by operating income before depreciation. log(BOOK_ASSETS) is the log total assets. log(FIRM_AGE) denotes the log of one plus the number of years since inclusion in the CRSP-COMPUSTAT universe. DEBT_TO_BOOK_ASSETS is the sum of debt in current liabilities and long-term debt divided by book value of assets. PHYSICAL_CAPITAL_TO_BOOK_ASSETS is total property, plant, and equipment divided by book value of assets. R&D_EXPENSES_TO_BOOK_ASSETS is research and development expenses divided by book value of assets. CAPITAL_EXPENDITURES_TO_BOOK_ASSETS is capital expenditures divided by book value of assets. EMPLOYEE_GROWTH and SALES_GROWTH denote percentage changes in the number of employees and sales relative to the previous year's values. PROFIT_MARGIN is net income divided by firm sales. In Panel E, CUSTOMERS_PROTECTED is equal to total firm customers in countries that implement stronger anti-counterfeiting enforcement (i.e., STRONGER_ACE countries) minus total firm customers in all countries that implement weaker anti-counterfeiting enforcement (i.e., WEAKER_ACE countries) in a given year. We compute total firm customers in a given country by multiplying the country population (in 100 millions) with that firm's brand usage percentage score from BAV. CUSTOMERS_STILL_EXPOSED denotes total firm customers in countries that are listed in Special 301 Reports and that have the same Special 301 status as the previous year. CUSTOMERS_NOT_EXPOSED denotes total firm customers in countries that are not listed in Special 301 Reports in a given year.

	N	Mean	Median	Std. Dev.	P5	P95
Panel A. Foreign-Segment Brand Characteristics (Publicly Traded U.S. Firms)						
BRAND_ASSET_VALUE	28,541	54.21	54.64	31.84	5.33	98.38
CUSTOMER_LOYALTY	28,541	59.15	63.08	30.09	7.68	98.29
BRAND_AWARENESS	28,541	48.96	47.10	30.14	4.84	96.02
BRAND_PROFIT_MARGIN	28,541	56.05	59.00	29.76	6.32	97.13
MARKET_PENETRATION	28,541	50.75	50.49	29.58	5.56	96.42
BRAND_INVENTIVENESS	28,541	59.00	63.47	29.91	6.79	98.03
BRAND_USAGE_PERCENTAGE	26,203	16.41	7.54	20.63	0.19	64.15
Panel B. Foreign-Segment Brand Characteristics (Non-U.S. Firms)						
BRAND_ASSET_VALUE	71,022	54.89	57.76	29.50	6.20	96.76
CUSTOMER_LOYALTY	71,022	56.28	59.43	28.66	7.35	96.86
BRAND_AWARENESS	71,022	51.94	52.54	29.26	5.71	96.03
BRAND_PROFIT_MARGIN	71,022	54.54	56.52	28.45	6.80	95.87
MARKET_PENETRATION	71,022	53.24	54.43	28.27	6.95	95.96
BRAND_INVENTIVENESS	71,022	52.58	54.24	29.25	4.94	95.33
BRAND_USAGE_PERCENTAGE	70,039	21.71	12.61	22.85	0.31	71.66
Panel C. Foreign-Segment Financial Characteristics (Publicly Traded U.S. Firms)						
log(SEGMENT_SALES)	96,200	6.32	0.00	8.36	0.00	19.81
log(SEGMENT_ASSETS)	96,200	3.73	0.00	7.02	0.00	18.82
log(SEGMENT_CAPEX)	96,200	0.34	0.00	1.95	0.00	0.00
SALES_BASED_SEGMENT_HHI	96,200	0.31	0.22	0.29	0.00	0.99
Panel D. Firm-Level Financial Characteristics (Publicly Traded U.S. Firms)						
log(TOBINS_Q)	2,712	0.61	0.50	0.56	−0.05	1.65
log(MARKET_TO_BOOK)	2,667	1.04	0.97	0.91	−0.25	2.63
log(AVEBITDA)	2,648	2.61	2.52	0.58	1.91	3.67
log(BOOK_ASSETS)	2,712	9.60	9.65	2.00	6.12	13.20
log(FIRM_AGE)	2,713	8.69	8.98	1.15	6.71	9.77
DEBT_TO_BOOK_ASSETS	2,698	0.25	0.23	0.22	0.00	0.58
PHYSICAL_CAPITAL_TO_BOOK_ASSETS	2,608	0.51	0.45	0.32	0.07	1.12
R&D_EXPENSES_TO_BOOK_ASSETS	1,861	0.04	0.03	0.04	0.00	0.12
CAPITAL_EXPENDITURES_TO_BOOK_ASSETS	2,613	0.06	0.04	0.06	0.00	0.15
EMPLOYEE_GROWTH	2,566	0.05	0.01	0.24	−0.15	0.31
SALES_GROWTH	2,631	0.08	0.06	0.31	−0.16	0.36
PROFIT_MARGIN	2,712	0.07	0.06	0.08	−0.06	0.21
Panel E. Firm-Level Customer Counterfeit Exposure (Publicly Traded U.S. Firms)						
CUSTOMERS_PROTECTED	2,713	−0.01	0.00	0.68	−0.49	0.41
CUSTOMERS_STILL_EXPOSED	2,713	1.19	0.31	2.41	0.00	5.63
CUSTOMERS_NOT_EXPOSED	2,713	0.47	0.10	1.29	0.00	2.00

C. Summary Statistics on Financial Characteristics and Firm-Level Counterfeit Exposure

In this section, we provide detailed summary statistics on i) firm- and segment-level financial metrics and ii) firm-level exposure measures to global counterfeiting. We use the Thomson Reuters Worldscope database to gather data on foreign segment sales, assets, and capital expenditures of publicly traded U.S. firms.[21] These variables are computed using Worldscope items 19,600 to 19,690. We drop financial firms because our focus is on the effects of counterfeits on real products, and we winsorize all our variables at 1% from each tail. This filter is important to minimize the effects of a few very large and very small firms on the relationship between counterfeit activity and sales.

We report summary statistics on foreign segments in Panel C of Table 2. As shown, the mean of log firm sales equals 6.32, the mean of log firm assets equals 3.73, the mean of capital expenditures equals 0.34, and the mean of sales-based segment HHI equals 0.31. In Panel D, we report the financial characteristics of public U.S. firms from the merged Special 301 Reports, BAV, and CRSP-COMPUSTAT universe. We present firm-level characteristics on valuation, debt, investments, and growth profitability. The median log Tobin's Q, for example, is 0.50. The median log firm age is 8.98, the median debt-to-asset ratio is 0.23, the median capital-expenditures-to-assets ratio is 0.04, and the median profit margin is 0.06.

We report the firm-level counterfeiting exposure of publicly traded U.S. firms in Panel E of Table 2. CUSTOMERS_PROTECTED is equal to total firm customers in countries that implement stronger anti-counterfeiting enforcement (i.e., STRONGER_ACE countries) minus total firm customers in all countries that implement weaker anti-counterfeiting enforcement (i.e., WEAKER_ACE countries) in a given year. We compute total firm customers in a given country by multiplying the country population (in 100 millions) with that firm's brand usage percentage score from BAV. CUSTOMERS_STILL_EXPOSED denotes total firm customers in countries that are listed in Special 301 Reports and that have the same Special 301 status in the previous year. CUSTOMERS_NOT_EXPOSED denotes total firm customers in countries that are not listed in Special 301 Reports in a given year. We proxy total firm *i* customers in a given country by multiplying country population with firm *i*'s brand usage percentage score from BAV surveys. The brand usage percentage scores reflect the percentage of survey respondents who report that they actively use a given brand.[22]

[21] Accounting standards on operating segments (IFRS 8 and FASB ASC 280) require a firm to report material revenue from external customers separately for its country of domicile and foreign countries. See also Denis, Denis, and Yost (2002) for the scope and limitations of geographic segment reporting.

[22] To provide a simple example, assume Nike operated only in France and Russia in 2010. Let us say that France is put on the Watch List (i.e., its status changed from Not Listed to Watch Listed) in 2010, and Russia is removed from the Watch List (i.e., its status changed from Watch Listed to Not Listed). France (which has a population of 70 million) therefore weakened its anti-counterfeiting enforcement by one notch and Russia (which has a population of 150 million) strengthened it by one notch. If 1% of consumers in France used Nike in 2010 and 1.2% of consumers in Russia used Nike in 2010, our CUSTOMERS_PROTECTED measure for Nike in 2010 would then be equal to 1.1 million ($150 \times 1.2\% - 70 \times 1\%$). CUSTOMERS_PROTECTED, therefore, provides a novel annual measure

As shown in Panel E of Table 2, the mean value for CUSTOMERS_PROTECTED is −0.01, the mean value for CUSTOMERS_STILL_EXPOSED is 1.19, and the mean value for CUSTOMERS_NOT_EXPOSED is 0.47. Therefore, for the average firm in our sample: 1 million more foreign customers are experiencing weaker anti-counterfeiting enforcement in their countries compared with the previous year; 119 million customers live in foreign countries that have been diagnosed with counterfeiting problems in Special 301 Reports that have neither worsened nor improved compared with the previous year; and 47 million customers are from countries that are not listed in Special 301 Reports by the USTR. These figures highlight that a significant proportion of U.S. firms' customers are in foreign countries with severe counterfeiting issues. The following section presents our empirical framework and highlights how the key variables introduced in this section are used in our analyses.

IV. Framework

This section provides information on the empirical specifications used in our analyses. To study the relationship between segment-level outcomes and counterfeit exposure, we run regressions using the below specification:

$$(1) \quad Y_{i,j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} + \beta_2 \times \text{WATCHLIST}_{j,t} + \gamma' X_{i,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $Y_{i,j,t}$ denotes the log segment sales – or brand metrics – of firm i in year t in foreign country j; PRIORITY_WATCHLIST$_{j,t}$ is equal to 1 if foreign country j is listed as a Special 301 Priority Watch List country in year t; WATCHLIST$_{j,t}$ is equal to 1 if foreign country j is listed as a Special 301 Watch List country in year t.[23] As controls, we use log(SEGMENT_ASSETS), log(SEGMENT_CAPEX), SALES-BASED_SEGMENT_HHI, MISSING_ASSETS, and MISSING_CAPEX. Foreign-segment investments and assets seek to control for the revenue-generating capabilities of a given firm in a given foreign country, and the sales-based competition index seeks to control for market competitiveness, which can relate to pricing, production, and counterfeiting. As brand metrics, we use the BAV measures BRAND_ASSET_VALUE, BRAND_PROFIT_MARGIN, MARKET_PENETRATION, CUSTOMER_LOYALTY, BRAND_AWARENESS, and BRAND_INVENTIVENESS.

We cluster standard errors by firm and country because we expect the correlation of errors to be high within a particular firm country (e.g., Nike in Germany). This being said, it is possible to articulate arguments in regard to other dependency structures across the observations. For example, sales of all the firms in a given country could be correlated at the country level (e.g., when a country grows at a

of a firm's customer base affected by changes in anti-counterfeiting enforcement around the globe. Scaling this variable by either i) the total population of markets in which the firm and its competitors operate or ii) the total sales of the company in the past year does not change our conclusions.

[23]Because there are 11 PFC listings between 1993 and 2014, we group the PFCs with the PWL countries. Doing so designates "Not Listed" as the omitted category in the regression. Excluding the PFCs does not change our main conclusions.

certain rate, sales of all firms might increase at a similar growth rate). Alternatively, changes in sales could be correlated at the firm level (e.g., when a firm develops a new product) it could push sales in all segments of the firm across the world. Our conclusions are generally robust to using firm- or country-level clustered standard errors.

There are multiple benefits to using the above empirical specification. With industry-year interacted fixed effects we separate out the effects of watch list designations from the potential effects of contemporaneous shocks at the industry-year level. This is necessary because counterfeiting can be more prevalent in certain industries compared with others in a given year. According to the USTR reports, for example, usage of pirated optical media (i.e., CDs, VCDs, and DVDs) reached 100% in Vietnam, 71% in Colombia, 100% in Ukraine, 98% in Peru, and 90% in Pakistan in certain years. Other industries such as alcoholic beverages, food, or print media did not suffer from comparable increases simultaneously.

By introducing firm-country interacted fixed effects, we examine segment sales of a given firm in a given foreign country across time. We include these fixed effects because counterfeit activity could be more intense for certain firms' products than those of other firms in a particular country (e.g., Nike in France vs. ASICS in France). Firm-country fixed effects absorb such omitted factors that can otherwise contribute to the variation of segment sales, brand scores, and watch list designations. Furthermore, they absorb any time-invariant bilateral characteristics (e.g., trade agreements and country reputations) that can otherwise complicate inference.

Finally, with firm-year interacted fixed effects, we control for yearly shocks at the firm level. With these fixed effects, we compare foreign segments of firms with counterfeiting problems in a given year against their foreign segments without counterfeiting problems. These fixed effects are helpful since counterfeiters may target certain companies more than others in a given year. Profits from infringing a particular company's products can, for example, be higher due to higher sales prices or lower costs of counterfeiting (e.g., Nike in 2005 vs. ASICS in 2005).

To study the ramifications of anti-counterfeiting enforcement on brand metrics, we introduce the second specification below:

$$(2)\quad Y_{i,j,t} = \alpha + \gamma_1 \times \text{STRONGER\_ACE}_{j,t} + \gamma_2 \times \text{WEAKER\_ACE}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $\Delta Y_{i,j,t}$ denotes changes in BAV brand metrics (described above) of firm i from year $t-1$ to year t in country j. STRONGER_ACE $_{j,t}$ and WEAKER_ACE$_{j,t}$ indicate whether anti-counterfeiting enforcement efforts in country j get stronger or weaker from year $t-1$ to year t. The fixed effects structures used in specification (2) are the same as the ones used in specification (1).

If the substitution effect dominates the advertising effect, we expect to find β_1 and β_2 to be negative in the specification (1). Moreover, under the same scenario, stronger (weaker) anti-counterfeiting enforcement should eliminate (magnify) counterfeits and therefore boost (reduce) firm sales and brand metrics. This suggests we should find γ_1 to be positive and γ_2 to be negative in the specification (2). We empirically test these predictions against the null hypothesis that counterfeiting and anti-counterfeiting enforcement efforts have no effects on the above variables.

V. Main Results

This section presents the main findings of our article. We start by demonstrating the ramifications of counterfeiting on U.S. businesses' foreign segment sales in Section V.A. In Section V.B, we report how counterfeits and anti-counterfeiting efforts influence the brand metrics described in Section III. Sections V.C and V.D present how firm-level exposure to counterfeiting influences firm investment, profitability, and value. Section V.E reports the ramifications of Special 301 actions on IP office creation and product seizures in foreign countries.

A. Counterfeits and Foreign-Segment Sales

We start our analyses by investigating the relationship between foreign segment sales and counterfeiting problems following specification (1). The estimated coefficients of interest are those on PRIORITY_WATCHLIST$_{j,t}$ and WATCHLIST$_{j,t}$ which denote foreign country *j*'s Special 301 designation in year *t.* We present our findings in Table 3.

As shown in column 1, after controlling for firm and year fixed effects, we find that a given U.S. firm attains around 13% lower sales in countries listed on the Special 301 Watch List and 45% lower sales in countries listed on the Special 301 Priority Watch List. Compared with sample means reported in Panel C of Table 2, the estimated coefficients in Table 3 correspond to an up to 8.39% reduction in the dependent variable. These findings are consistent with the argument that the substitution effect dominates the advertising effect on average and highlight that U.S. firms observe weaker sales in countries as counterfeiting problems become more severe.

B. Counterfeits and Brand Metrics

In this section, we investigate the effects of counterfeits and anti-counterfeiting enforcement on brand metrics. We start by running specifications (1) and (2) on brand asset scores. The estimated coefficients of interest are the ones on PRIORITY_WATCHLIST$_{j,t}$ and WATCHLIST$_{j,t}$ in specification (1) and STRONGER_ACE$_{j,t}$ and WEAKER_ACE$_{j,t}$ in the specification (2). We present our findings in Table 4.

The results in column 1 suggest that firms attain brand asset scores that are 2.32 units lower in countries listed on the Special 301 Watch List (WL) and brand asset scores that are 4.93 units lower in countries listed on the Special 301 Priority Watch List (PWL). These results are robust to controlling for firm and year-fixed effects. Compared with sample means reported in Table 2, the estimated coefficient values reflect 4.3% to 9.1% reductions in brand values in Watch List and Priority Watch List countries, respectively. As shown in columns 3–5 of Table 4, in PWL (WL) countries, U.S. brands obtain brand asset values that are 5.07% (2.55%) lower after controlling for firm and industry-year dummies, 4.88% (2.46%) lower after controlling for firm-year dummies, and 3.25% (1.41%) lower after controlling for firm-year and firm-country dummies. These findings provide additional evidence consistent with the argument that the substitution effect dominates the advertising effect.

TABLE 3

Anti-Counterfeiting Enforcement and Foreign Segment Sales

Table 3 reports regressions of firm segment sales on anti-counterfeiting enforcement around the globe. In columns 1–5, we run regressions using the following specification:

$$Y_{i,j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} + \beta_2 \times \text{WATCHLIST}_{j,t} + \gamma' X + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $Y_{i,j,t}$ denotes log segment sales of firm i in year t in country j; PRIORITY_WATCHLIST$_{j,t}$ is equal to 1 if country j is listed as a Priority Watch List country by the USTR; and WATCHLIST$_{j,t}$ is equal to 1 if country j is listed as a Watch List country by the USTR. X includes segment-level control variables. log(SEGMENT_SALES) denotes log firm sales in a foreign country, log(SEGMENT_ASSETS) denotes log firm assets in a foreign country, and log(SEGMENT_CAPEX) denotes log firm capital expenditures in a foreign country. These variables are computed using the Worldscope items 19,600 to 19,690. SALES-BASED_SEGMENT_HHI denotes the Herfindahl–Hirschman index, which is computed yearly in every foreign segment at the industry level (using Fama–French 48 industries) using sales. MISSING_ASSETS and MISSING_CAPEX are equal to 1 if segment assets and capital expenditures are equal to 0, respectively. Firms are publicly listed corporations in Thomson Reuters Worldscope universe, and data spans the period between 1993 and 2014. ***, **, or * indicates that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

	log(SEGMENT_SALES$_{i,j,t}$)				
	1	2	3	4	5
PRIORITY_WATCHLIST$_{j,t}$	−0.45***	−0.28**	−0.42***	−0.35***	−0.53***
	(−4.20)	(−2.45)	(−3.89)	(−2.89)	(−4.17)
WATCHLIST$_{j,t}$	−0.13*	−0.09	−0.10	0.01	−0.20**
	(−1.78)	(−1.04)	(−1.35)	(0.09)	(−2.14)
log(SEGMENT_ASSETS$_{i,j,t}$)	0.60***	0.70***	0.62***	0.63***	0.68***
	(25.56)	(35.35)	(25.81)	(15.38)	(16.02)
log(SEGMENT_CAPEX$_{i,j,t}$)	0.25***	0.44***	0.26***	0.28***	0.04
	(4.85)	(9.44)	(5.04)	(4.59)	(0.41)
HHI$_{i,j,t}$	−0.04	−0.28**	−0.05	−0.31**	0.78***
	(−0.36)	(−2.19)	(−0.38)	(−2.14)	(5.58)
MISSING_ASSETS$_{i,j,t}$	−4.44***	−2.16***	−4.07***	−3.30***	−2.20***
	(−11.54)	(−6.43)	(−10.29)	(−4.84)	(−3.13)
MISSING_CAPEX$_{i,j,t}$	2.62***	6.26***	2.69***	1.28	−1.84
	(3.58)	(9.22)	(3.59)	(1.42)	(−1.27)
Firm FE	Yes	No	Yes	No	No
Year FE	Yes	No	No	No	No
Industry-year FE	No	Yes	Yes	No	No
Firm-year FE	No	No	No	Yes	Yes
Firm-country FE	No	No	No	No	Yes
No. of obs.	96,186	96,198	96,184	77,031	77,010
R^2	0.621	0.537	0.631	0.761	0.834

In column 6 of Table 4, we examine whether counterfeiting in a given foreign country impacts brand asset scores in its closest neighbor that is *not listed* in Special 301 Reports.[24] With this placebo test, we want to provide empirical evidence on 2 questions. First, we want to demonstrate that it is indeed the anti-counterfeiting activities in a given country that drives our results rather than regional intellectual property rights (IPR) trends that may occur concurrently with Special 301 designations. Second, we want to provide empirical evidence on the well-being of U.S. brands in countries that neighbor watch-listed countries but are not watch-listed themselves. Evidence of deterioration in the brand values of U.S. firms in these countries could suggest potential spillover effects and demonstrate that the USTR is slow to react to or diagnose problems in these locations. After accounting for the firm-country and firm-year fixed effects, we do not find a statistically significant relationship between brand asset values and placebo Special 301 designations,

[24]We use population-weighted distances as in Mayer and Zignago (2005) and restrict the sample to those countries with brand asset surveys and to countries that are at most 6,000 km away.

TABLE 4

Anti-Counterfeiting Enforcement and Brand Reputation

Table 4 reports regressions of BAV brand asset scores on anti-counterfeiting enforcement around the globe. In Panel A, we run regressions using the following specification:

$$Y_{i,j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} + \beta_2 \times \text{WATCHLIST}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $Y_{i,j,t}$ denotes the brand asset value of firm i in year t in country j; $\text{PRIORITY\_WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Priority Watch List country by the USTR; and $\text{WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Watch List country by the USTR. In Panel B, we run regressions using the following specification:

$$\Delta Y_{i,j,t} = \alpha + \beta_1 \times \text{STRONGER\_ACE}_{j,t} + \beta_2 \times \text{WEAKER\_ACE}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $\Delta Y_{i,j,t}$ denotes changes in the brand asset value of firm i from year $t-1$ to year t in country j; $\text{STRONGER\_ACE}_{j,t}$ is equal to 1 if there is a positive change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Priority Watch List to Watch List, from Watch List to Not Listed, or from Priority Watch List to Not Listed); and $\text{WEAKER\_ACE}_{j,t}$ is equal to 1 if there is a negative change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Watch List to Priority Watch List, from Not Listed to Watch List, or from Not Listed to Priority Watch List). In Panel B, we report results from our placebo test, in which we regress brand asset scores and the change in brand asset scores in the nearest available country to country j that is not listed in Special 301 Reports. We label these tests "Placebo." Firms are publicly listed corporations from the BAV universe, spanning all BAV surveys carried out around the globe between 1993 and 2014. ***, **, or * indicates that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

	$\text{BRAND\_ASSET\_VALUE}_{i,j,t}$					Placebo	$\Delta\text{BRAND\_ASSET\_VALUE}_{i,j,t}$					Placebo
	1	2	3	4	5	6	7	8	9	10	11	12
$\text{PRIORITY\_WATCHLIST}_{j,t}$	−4.93***	−3.42***	−5.07***	−4.88***	−3.25***	0.49						
	(−5.73)	(−2.89)	(−5.91)	(−5.30)	(−8.90)	(0.96)						
$\text{WATCHLIST}_{j,t}$	−2.32***	−2.18**	−2.55***	−2.46***	−1.41***	0.44						
	(−3.12)	(−2.18)	(−3.48)	(−3.11)	(−4.54)	(1.13)						
$\text{STRONGER\_ACE}_{j,t}$							0.81***	0.85***	0.82***	0.79***	0.80***	0.37
							(4.75)	(4.97)	(4.83)	(4.73)	(4.38)	(1.01)
$\text{WEAKER\_ACE}_{j,t}$							−0.44***	−0.45***	−0.47***	−0.57***	−0.42**	−0.45
							(−3.09)	(−3.13)	(−3.25)	(−3.77)	(−2.55)	(−1.39)
Firm FE	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No	No
Year FE	Yes	No	No	No	No	No	Yes	No	No	No	No	No
Industry-year FE	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
Firm-year FE	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Firm-country FE	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes
No. of obs.	28,541	28,541	28,541	28,541	28,541	23,591	26,030	26,030	26,030	26,030	26,030	21,384
R^2	0.599	0.246	0.612	0.643	0.948	0.884	0.042	0.046	0.073	0.220	0.266	0.243

which supports the notion that our findings are indeed driven by anti-counterfeiting enforcement in targeted countries.

In addition to investigating the relationship between brand reputation and Special 301 status, we also study how changes in foreign-country anti-counterfeiting enforcement practices (i.e., changes in Special 301 status) relate to changes in brand reputations in the corresponding foreign countries using specification (2). Columns 7–11 of Table 4 show that a positive change in anti-counterfeiting enforcement contemporaneously bolsters the brand reputations of U.S. firms, and a negative change in anti-counterfeiting enforcement contemporaneously harms the brand reputations of U.S. firms.

As shown in column 7, when anti-counterfeiting enforcement in a given foreign country is strengthened, the brand values of U.S. corporations in that country increase on average by 0.81 units. In contrast, if anti-counterfeiting enforcement in a given foreign country weakens, the brand values of U.S. corporations in that country decrease on average by 0.44 units. These correspond to 1.5% and −0.5% changes relative to the sample mean, respectively. Once again, we obtain similar findings when we correct for an array of industry-year, firm-year, and firm-country fixed effects, and we do not find significant results in our placebo test. These results show a robust relationship between brand values and anti-counterfeiting enforcement. Publicly listed U.S. corporations enjoy higher brand asset values in countries where they are less exposed to counterfeiting problems, and changes in foreign-country anti-counterfeiting enforcement efforts are associated with changes in firms' brand asset values.

Next, we test which of the brand asset value components (i.e., brand profit margin, market penetration, customer loyalty, and brand awareness) are affected by the counterfeits and enforcement. We rerun specifications (1) and (2) on these variables and present our findings in Table 5. As shown in column 1 of Table 5, we find that a given U.S. firm attains a 1.46% lower profit margin score in a WL country and a 2.17% lower profit margin score in a PWL country. U.S. firms also attain lower market penetration, customer loyalty, and brand awareness scores in WL and PWL countries. In particular, market penetration is 0.51% and 2.06% lower, customer loyalty is 1.45% and 3.16% lower, and brand awareness is 0.93% and 2.70% lower in WL and PWL countries, respectively. These results suggest that U.S. firms experience difficulty acquiring new customers in WL and PWL countries due to reductions in customer awareness of their products. U.S. firms also experience difficulty charging premium prices in these countries due to distortions in brand differentiation and customer loyalty.

Although counterfeiters cannot systematically copy what has not yet been created by a genuine producer, they can still interfere with a genuine producer's innovation process.[25] Increased counterfeit activity can, for example, induce firms to select more conservative investment decisions. This can distort firm inventiveness and the type of products the firm can produce in the future. As shown in column 5 of Table 5, we pin down a reduction of 1.46% (2.47% relative to the

[25]Counterfeiters can use leaked product designs or reverse engineer existing products to design new ones with unauthorized trademarks, which could also deteriorate genuine producers' reputation for innovativeness.

TABLE 5

Anti-Counterfeiting Enforcement and Components of Brand Perception

Table 5 reports regressions of brand value components on enforcement against counterfeiting activities around the globe. In columns 1–4, we run regressions using the following specification:

$$Y_{i,j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} + \beta_2 \times \text{WATCHLIST}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $Y_{i,j,t}$ includes BAV measures BRAND_PROFIT_MARGIN, MARKET_PENETRATION, CUSTOMER_LOYALTY, BRAND_AWARENESS and BRAND_INVENTIVENESS of firm i in year t in country j; $\text{PRIORITY\_WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Priority Watch List country by the USTR; and $\text{WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Watch List country by the USTR. In columns 4–8, we run regressions using the following specification:

$$\Delta Y_{i,j,t} = \alpha + \beta_1 \times \text{STRONGER\_ACE}_{j,t} + \beta_2 \times \text{WEAKER\_ACE}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $\Delta Y_{i,j,t}$ denotes changes in BAV measures BRAND_PROFIT_MARGIN, MARKET_PENETRATION, CUSTOMER_LOYALTY, BRAND_AWARENESS and BRAND_INVENTIVENESS of firm i from year $t-1$ to year t in country j; $\text{STRONGER\_ACE}_{j,t}$ is equal to 1 if there is a positive change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Priority Watch List to Watch List, from Watch List to Not Listed, or from Priority Watch List to Not Listed); $\text{WEAKER\_ACE}_{j,t}$ is equal to 1 if there is a negative change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Watch List to Priority Watch List, from Not Listed to Watch List, or from Not Listed to Priority Watch List). Firms are publicly listed corporations from the BAV universe, spanning all BAV surveys carried out around the globe between 1993 and 2014. ***, **, or * indicate that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

	BRAND_PROFIT_MARGIN	MARKET_PENETRATION	CUSTOMER_LOYALTY	BRAND_AWARENESS	BRAND_INVENTIVENESS
	1	2	3	4	5
$\text{PRIORITY\_WATCHLIST}_{j,t}$	−2.17***	−2.06***	−3.16***	−2.70***	−1.46**
	(−3.46)	(−4.80)	(−6.31)	(−9.13)	(−2.43)
$\text{WATCHLIST}_{j,t}$	−1.46***	−0.51	−1.45***	−0.93***	−0.48
	(−2.96)	(−1.47)	(−3.76)	(−3.87)	(−0.97)
Firm-year FE	Yes	Yes	Yes	Yes	Yes
Firm-country FE	Yes	Yes	Yes	Yes	Yes
No. of obs.	28,541	28,541	28,541	28,541	28,541
R^2	0.794	0.920	0.892	0.963	0.821
	ΔBRAND_PROFIT_MARGIN	ΔMARKET_PENETRATION	ΔCUSTOMER_LOYALTY	ΔBRAND_AWARENESS	ΔBRAND_INVENTIVENESS
	6	7	8	9	10
$\text{STRONGER\_ACE}_{j,t}$	0.63*	0.96***	0.65**	0.79***	0.95***
	(1.66)	(4.29)	(2.57)	(5.27)	(2.61)
$\text{WEAKER\_ACE}_{j,t}$	−0.21	0.13	−1.07***	0.06	0.38
	(−0.55)	(0.65)	(−3.96)	(0.46)	(1.15)
Firm-year FE	Yes	Yes	Yes	Yes	Yes
Firm-country FE	Yes	Yes	Yes	Yes	Yes
No. of obs.	26,030	26,030	26,030	26,030	26,031
R^2	0.228	0.239	0.241	0.280	0.230

sample mean) in brand inventiveness in PWL countries. Since BAV's brand inventiveness formula is proprietary, we separately report in Table A.I of the Supplementary Material, the influence of counterfeits on all 3 of the image attributes that drive this measure and their first principal component. Collectively, our findings on brand inventiveness proxies provide additional support for the distortionary effects of counterfeits.

As shown in columns 6–10 of Table 5, *stronger* anti-counterfeiting enforcement is associated with *higher* brand profit margin, market penetration, customer loyalty, brand awareness, and inventiveness, and *weaker* anti-counterfeiting enforcement is associated especially with *lower* customer loyalty. In particular, a positive change in Special 301 status increases profit margin by 0.63%, market penetration by 0.96%, customer loyalty by 0.65%, brand awareness by 0.79%, and brand inventiveness by 0.95%. A negative change in Special 301 status, however, decreases customer loyalty by 1.07%.

Our results so far highlight the negative effects of counterfeit exposure on foreign segment sales and branding. Additionally, we show that stronger anti-counterfeiting enforcement, proxied by positive changes in Special 301 status, improves the above metrics. In the following section, we study how firms respond to stronger anti-counterfeiting enforcement in foreign countries by altering their investment decisions. We then investigate how firm value is related to counterfeiting and enforcement dynamics in foreign countries.

C. Counterfeits and Corporate Activity

The previous sections provide evidence supporting the substitution hypothesis and highlight the negative effects of counterfeiting on firm sales and brand metrics as well as the positive effects of anti-counterfeiting enforcement on brands. In this section, we study the ramifications of counterfeiting enforcement at the firm level. In particular, we examine the impact of anti-counterfeiting enforcement across the globe on firm-level investments and profitability. To do so, we exploit our customer base proxies previously explained in Section III.C and run regressions using the following specification:

$$\begin{aligned} Y_{i,t} = {} & \alpha + \beta \times \text{CUSTOMERS\_PROTECTED}_{i,t} \\ & + \rho \times \text{CUSTOMERS\_STILL\_EXPOSED}_{i,t} \\ & + \tau \times \text{CUSTOMERS\_NOT\_EXPOSED}_{i,t} \\ & + \gamma' X_{i,t} + \text{Fixed effects} + \varepsilon_{i,t}, \end{aligned} \tag{3}$$

where $Y_{i,t}$ denotes capital expenditures, R&D expenditures, the percentage change in number of employees, sales growth, or profit margin of firm i in year t. As control variables, we include Tobin's Q, cash-flow-to-assets ratio, and leverage. The estimated coefficients of interest are the ones on $\text{CUSTOMERS\_PROTECTED}_{i,t}$, $\text{CUSTOMERS\_STILL\_EXPOSED}_{i,t}$, and $\text{CUSTOMERS\_NOT\_EXPOSED}_{i,t}$.

We present our results in Table 6. As shown in Panel A, we find a negative relationship between anti-counterfeiting enforcement and firm-level capital expenditures, R&D expenditures, employee growth, and sales growth of publicly traded U.S. corporations. In particular, every 100 million customers affected by a positive unit change in anti-counterfeiting enforcement are associated with a 0.22% reduction in capital expenditures and a 0.15% reduction in R&D expenditures. Following the increased anti-counterfeiting enforcement, firms also exhibit lower employee growth (0.98%) and sales growth (1.84%), whereas the same amount of people affected by a positive anti-counterfeiting enforcement rule is associated with a 0.24% increase in the profit margin.

A potential explanation for these findings is there is a particular set of firms that would benefit most from anti-counterfeiting enforcement in foreign countries, and they lobby for trade protection by the U.S. government. These firms would therefore substitute their investment spending with spending on lobbying. To investigate whether our results are driven primarily by the efforts of such lobbying firms, we do the following: We first manually identify U.S. industries that are related to each of the Special 301 listings. Then, we mark the firms that are from industries cited by the USTR as the industries directly impacted by counterfeiting

TABLE 6

Anti-Counterfeiting Enforcement and Firm-Level Activity

Table 6 shows how enforcement against counterfeiting activities around the globe affects corporate activities. We run regressions using the following specification:

$$Y_{i,t} = \alpha + \beta \times \text{CUSTOMERS\_PROTECTED}_{i,t} + \rho \times \text{CUSTOMERS\_STILL\_EXPOSED}_{i,t} + \tau \times \text{CUSTOMERS\_NOT\_EXPOSED}_{i,t} + \gamma' X_{i,t} + \text{Fixed effects} + \varepsilon_{i,t},$$

where Y denotes capital expenditures, R&D expenditures, employee growth, sales growth, or profit margin of firm i in year t. CUSTOMERS_PROTECTED is equal to total firm customers in countries that implement stronger anti-counterfeiting enforcement (i.e., STRONGER_ACE countries) minus total firm customers in all countries that implement weaker anti-counterfeiting enforcement (i.e., WEAKER_ACE countries) in a given year. We compute total firm customers in a given country by multiplying country population (in 100 millions) with that firm's brand usage percentage score from BAV. CUSTOMERS_STILL_EXPOSED denotes total firm customers in countries that are listed in Special 301 Reports and that have the same Special 301 status as the previous year. CUSTOMERS_NOT_EXPOSED denotes total firm customers in countries that are not listed in Special 301 Reports in a given year. CAPEX/ASSETS$_{-1}$ is capital expenditures divided by book value of assets. R&D/ASSETS is research and development expenses divided by book value of assets. EMPLOYEE_GROWTH is percentage change in firm i's number of employees from year $t-1$ to t. SALES_GROWTH is percentage change in firm i's sales from year $t-1$ to t. PROFIT_MARGIN is net income divided by firm sales. Q$_{-1}$ is equal to book value of assets plus market equity minus book value of equity, divided by book value of assets. CASH_FLOW/ASSETS$_{-1}$ is the sum of income before extraordinary items, depreciation, amortization, divided by book value of assets. LEVERAGE$_{-1}$ is the sum of debt in current liabilities and long-term debt divided by book value of assets. In Panel A, we report the results using the full sample. In Panel B, we study a restricted sample that excludes all industries that are directly impacted by counterfeit exposure, as reflected by USTR comments. Coefficients are presented in percentage terms. The sample period is from 1993 to 2014. ***, **, or * indicates that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

Panel A. Anti-Counterfeiting Enforcement and Firm-Level Activity

	CAPEX/ ASSETS$_{-1}$ (%)	R&D/ ASSETS$_{-1}$ (%)	EMPLOYEE_ GROWTH (%)	SALES_ GROWTH (%)	PROFIT_ MARGIN (%)
	1	2	3	4	5
CUSTOMERS_PROTECTED	−0.22**	−0.15***	−0.98**	−1.84**	0.24*
	(−2.23)	(−3.18)	(−2.26)	(−2.51)	(1.85)
CUSTOMERS_STILL_EXPOSED	−0.02	0.13**	−0.14	−0.41	0.08
	(−0.40)	(2.39)	(−0.38)	(−1.09)	(0.95)
CUSTOMERS_NOT_EXPOSED	−0.26***	−0.12*	−0.37	−0.63	0.08
	(−4.90)	(−1.85)	(−1.06)	(−1.63)	(1.05)
Q$_{-1}$	0.97***	0.42***	2.18**	2.66**	−0.90***
	(4.10)	(3.34)	(2.46)	(2.12)	(−6.52)
CASH_FLOW/ASSETS$_{-1}$	7.01**	−6.22**	37.11***	51.82**	74.60***
	(2.35)	(−2.77)	(3.02)	(2.30)	(11.37)
LEVERAGE$_{-1}$	−0.01***	0.01***	−0.00	0.00	−0.02***
	(−5.63)	(6.21)	(−0.41)	(0.28)	(−5.87)
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
No. of obs.	2,112	1,491	2,084	2,121	2,121
R^2	0.729	0.867	0.328	0.376	0.818

Panel B. Anti-Counterfeiting Enforcement and Firm-Level Activity After Excluding Industries that Are Directly Impacted by Foreign Counterfeiters

	CAPEX/ ASSETS$_{-1}$ (%)	R&D/ ASSETS$_{-1}$ (%)	EMPLOYEE_ GROWTH (%)	SALES_ GROWTH (%)	PROFIT_ MARGIN (%)
	1	2	3	4	5
CUSTOMERS_PROTECTED	−0.24**	−0.17***	−0.93**	−2.00**	0.23**
	(−2.73)	(−4.17)	(−2.76)	(−2.60)	(2.17)
CUSTOMERS_STILL_EXPOSED	0.01	0.16**	−0.08	−0.25	0.08
	(0.15)	(2.52)	(−0.24)	(−0.77)	(0.93)
CUSTOMERS_NOT_EXPOSED	−0.31***	−0.10	−0.43	−0.74	0.03
	(−4.24)	(−1.47)	(−1.24)	(−1.57)	(0.43)
Q$_{-1}$	0.91***	0.45***	1.79**	2.28*	−0.84***
	(3.88)	(3.52)	(2.26)	(1.99)	(−5.82)
CASH_FLOW/ASSETS$_{-1}$	8.54***	−6.98***	44.37***	66.93***	71.38***
	(2.95)	(−3.24)	(3.60)	(3.22)	(10.88)
LEVERAGE$_{-1}$	−0.01***	0.01***	−0.00	−0.00	−0.01***
	(−5.74)	(3.30)	(−0.40)	(−0.01)	(−4.14)
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
No. of obs.	1,985	1,401	1,960	1,994	1,994
R^2	0.746	0.874	0.334	0.391	0.820

activities in the foreign country. If, for example, France is put on the Watch List in 2005 due to counterfeit pharmaceutical products, we exclude French segments of all U.S. pharmaceutical firms (not the entire firm) from the calculation of that firm's CUSTOMERS_PROTECTED variable along with other control variables. We also drop all of the Special 301 listings that are unrelated to counterfeiting problems. In additional tests, we follow Bertrand, Bombardini, and Trebbi (2017) and use the Open Secrets lobbying disclosure database to manually identify the firms that lobby the USTR and exclude them from our analyses as well.

In so doing, we find similar results (statistically and economically) for all of our dependent variables. As reported in Panel B of Table 6, we find that a positive change in anti-counterfeiting enforcement of a foreign country with 100 million firm customers is associated with a reduction in capital expenditures by 0.24%, R&D expenditures by 0.17%, employee growth by 0.93%, and sales growth by 2.00%. In contrast, the same number of people affected by a positive anti-counterfeiting enforcement rule is associated with a 0.23% increase in the profit margin, suggesting counterfeit enforcement measures help firms enjoy the rents of their strong brand reputations and market power.[26]

One caveat for this analysis is that the exclusion of nonlobbying industries can create selection problems, especially if the advertising effect dominates the substitution effect. We provide a detailed discussion of the potential pitfalls of endogenous nonlobbying decisions in Section VI.D. Our results in this section are broadly consistent with the monopolistic firm behavior predicted by Chamberlin (1933) – that is, firms enjoy rents of their brand value while their brand is under protection. Along these lines, our findings overlap with those of Heath and Mace (2019), who find that firms reduce their product quality and innovation after they are granted stronger trademark protection.

D. Counterfeits and Corporate Value

Having shown the effects of anti-counterfeiting enforcement on corporate investment and profitability, we now examine the impact of anti-counterfeiting enforcement on firm valuation. To do so, we run regressions using the following specification:

$$\begin{aligned} Y_{i,t} = {} & \alpha + \beta \times \text{CUSTOMERS\_PROTECTED}_{i,t} \\ & + \rho \times \text{CUSTOMERS\_STILL\_EXPOSED}_{i,t} \\ & + \tau \times \text{CUSTOMERS\_NOT\_EXPOSED}_{i,t} \\ & + \gamma' X_{i,t} + \text{Fixed effects} + \varepsilon_{i,t}, \end{aligned} \tag{4}$$

where $Y_{i,t}$ denotes log(TOBINS_Q), log(MARKET_TO_BOOK), or log(AVEBITDA) of firm i in year t. Following Bennedsen and Zeume (2017), we include various firm-level controls along with firm-fixed effects and year-fixed effects.

Panel A of Table 7 documents economically and statistically significant relationships between anti-counterfeiting enforcement and Tobin's Q, market-to-

[26]Our results on profit margins are particularly strong for the following Fama French 12 sectors: Consumer Durables (e.g., Furniture, Household Appliances) (SIC: 2500–2519, 2590–2599, 3630–3659, 3710–3711, 3714–3714, 3716–3716, 3750–3751, 3792–3792, 3900–3939, 3990–3999), Telecom (SIC: 4800–4899), Wholesale (SIC: 5000–5999), and Retail (SIC: 7200–7299, 7600–7699).

TABLE 7

Anti-Counterfeiting Enforcement and Firm Value

Table 7 shows how enforcement against counterfeiting activities around the globe affects firm values. We run regressions using the following specification:

$$Y_{i,t} = \alpha + \beta \times \text{CUSTOMERS\_PROTECTED}_{i,t} + \rho \times \text{CUSTOMERS\_STILL\_EXPOSED}_{i,t} + \tau \times \text{CUSTOMERS\_NOT\_EXPOSED}_{i,t} + \gamma' X_{i,t} + \text{Fixed effects} + \varepsilon_{i,t},$$

where Y denotes log(TOBINS_Q), log(MARKET_TO_BOOK), or log(AVEBITDA) of firm i in year t. CUSTOMERS_PROTECTED is equal to total firm customers in countries that implement stronger anti-counterfeiting enforcement (i.e., STRONGER_ACE countries) minus total firm customers in all countries that implement weaker anti-counterfeiting enforcement (i.e., WEAKER_ACE countries) in a given year. We compute total firm customers in a given country by multiplying country population (in 100 millions) with that firm's brand usage percentage score from BAV. CUSTOMERS_STILL_EXPOSED denotes total firm customers in countries that are listed in Special 301 Reports and that have the same Special 301 status as the previous year. CUSTOMERS_NOT_EXPOSED denotes total firm customers in countries that are not listed in Special 301 Reports in a given year. TOBINS_Q is equal to book value of assets plus market equity minus book value of equity, divided by book value of assets. MARKET_TO_BOOK is market value of equity divided by book value of equity, and AVEBITDA is AGGREGATE_VALUE/EBITDA, where aggregate value is market equity plus net debt. NET_DEBT is long-term debt plus debt in current liabilities minus cash and long-term investments. EBITDA is operating income before depreciation. log(BOOK_ASSETS) is the log book value of assets, and log(FIRM_AGE) is the number of years firm i has been in CRSP-COMPUSTAT Merged Files as of year t. log(BOOK_ASSETS_SQ) denotes the square of log(BOOK_ASSETS). In Panel A, we report the results using the full sample; in Panel B, we exclude all industries that are directly impacted by counterfeit exposure as reflected by USTR comments. Coefficients are presented in percentage terms. The sample period is from 1993 to 2013. ***, **, or * indicates that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

	Panel A. Regressions Using All Foreign Segments			*Panel B. Regressions Using the Restricted Sample*		
	log (TOBINS_Q)	log(MARKET_TO_BOOK)	log (AVEBITDA)	log (TOBINS_Q)	log(MARKET_TO_BOOK)	log (AVEBITDA)
	1	2	3	4	5	6
CUSTOMERS_PROTECTED	1.69**	3.23**	3.49**	1.42*	2.89**	2.96**
	(2.21)	(2.58)	(2.12)	(1.93)	(2.21)	(2.19)
CUSTOMERS_STILL_EXPOSED	−1.34	−2.20	−1.38	−1.32	−2.29	−1.67
	(−1.11)	(−1.49)	(−1.29)	(−1.00)	(−1.38)	(−1.30)
CUSTOMERS_NOT_EXPOSED	−0.04	−0.39	−0.28	−0.66	−0.84	−0.93
	(−0.05)	(−0.36)	(−0.31)	(−0.70)	(−0.76)	(−1.05)
log(BOOK_ASSETS)	−23.75	0.25	−22.81	−22.29	0.01	−19.01
	(−1.37)	(0.01)	(−1.17)	(−1.25)	(0.00)	(−0.97)
log(BOOK_ASSETS_SQ)	−0.05	−2.13*	0.40	−0.11	−2.12	0.20
	(−0.05)	(−1.81)	(0.36)	(−0.11)	(−1.72)	(0.17)
log(FIRM_AGE)	2.74*	3.23	1.78	2.81*	3.58	1.59
	(1.90)	(1.14)	(0.84)	(1.82)	(1.20)	(0.72)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	2,709	2,667	2,648	2,549	2,506	2,490
R^2	0.754	0.678	0.592	0.754	0.673	0.593

book, and AVEBITDA. Every 100 million firm customers affected by a positive change in anti-counterfeiting enforcement increase Tobin's Q by 1.69%, market-to-book by 3.23%, and AVEBITDA by 3.49%. The results, reported in Table 7, help us quantify the net effect of counterfeit enforcement. A back-of-the-envelope calculation that uses the total market capitalization of the U.S. firms in the sample ($5.2 trillion on average) and the coefficient estimates in column 2 of Table 7 (3.19%) suggests that the counterfeit enforcement measures of the U.S. government increase total U.S. firm valuation by $168 billion. Thus, if higher counterfeit enforcement standards prevented 100 million potential customers from using counterfeits rather than U.S. brands, this would explain a difference of $168 billion in market capitalization. We caution the reader that our estimate is an upper bound and that we make several important simplifying assumptions in the calculation of these figures.[27] Panel B of Table 7 reruns our regressions after excluding industries that

are directly related to Special 301 listings. Similar to previous investigations, this exclusion does not materially change our findings.

E. IP Office Creation and Special 301 Listings

Previous sections highlight the distortionary effects of counterfeits on segment and firm outcomes as well as the benefits of U.S. anti-counterfeiting enforcement. In this section, we provide 2 types of evidence on how foreign countries respond to Special 301 Reports. As discussed previously, the USTR provides detailed remarks on all Special 301 listings to explain why a given foreign country is listed, what it should do to get unlisted, and what would happen if there were not enough progress or no action taken. Among the suggested actions, 2 issues are frequently listed: i) establishing IP offices and ii) enforcing IP rights when violations occur.

We examine the first of these 2 items by analyzing the probability of establishing an IP office. To do so, we collect data on country IP offices from the World Intellectual Property Organization (WIPO) country profile web pages (see, e.g., http://www.wipo.int/directory/en). Merging this data with Special 301 data gives us a panel of 220 countries across 22 years. Although the WIPO reports IP office names, addresses, and websites, it does not report how long an office has been established (its "foundation years"). As a proxy for foundation years, we use an online domain age tool to determine how long ago an IP office website was created. We run the following linear probability model:

$$Y_{j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} + \beta_2 \times \text{WATCHLIST}_{j,t} + \text{Fixed effects} + \varepsilon_{j,t}, \tag{5}$$

where $Y_{j,t}$ is a dummy variable that takes a value of 1 if country j has an IP office in year t; $\text{PRIORITY\_WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Priority Watch List country in year t; and $\text{WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Watch List country in year t.

In Panel A of Table 8, we report the estimates of the linear probability model (columns 1 and 2). After controlling for country and year-fixed effects, we find that inclusion in Special 301 Reports is contemporaneously related to changes in IP office prevalence. The results in Panel A suggest that Watch List status increases the prevalence of IP offices by 7%, and a Priority Watch List status increases IP office prevalence by 20%. In a different specification, we regress changes in the IP_OFFICE variable on the STRONGER_ACE and WEAKER_ACE variables.

In so doing, we find that countries open new IP offices following a negative change in their Special 301 status. We caution the reader about the interpretation of these results, as it is possible that countries create IP offices right after the inclusion on the Watch List but it is also possible that countries create offices in anticipation of being included on the Watch List. While it is hard to pin down exactly which of

[27]For example, we assume that i) the enforcement effect will completely convert the consumer to a genuine product and the consumer is able to afford the genuine substitute; ii) the enforcement will be effective indefinitely and the market structure would not change with respect to products offered indefinitely; and iii) the market structure would not change with respect to products that may provide reasonable substitutes for the existing genuine products.

TABLE 8

Foreign Country Responses to Special 301 Listings

Panel A of Table 8 reports regressions of IP office introductions on Special 301 listings. In columns 1 and 2, we run regressions using the following specification:

$$Y_{i,j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} + \beta_2 \times \text{WATCHLIST}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $Y_{i,t}$ denotes whether country i has an IP office in year t or a change in IP office prevalence in country i from year $t-1$ to t; $\text{PRIORITY\_WATCHLIST}_{i,t}$ is equal to 1 if country i is listed as a Priority Watch List country in year t; and $\text{WATCHLIST}_{i,t}$ is equal to 1 if country i is listed as a Watch List country in year t. In column 3, we run regressions using the following specification:

$$\Delta Y_{i,j,t} = \alpha + \beta_1 \times \text{STRONGER\_ACE}_{j,t} + \beta_2 \times \text{WEAKER\_ACE}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $\Delta Y_{i,t}$ denotes changes in IP office prevalence in country i from year $t-1$ to t; $\text{STRONGER\_ACE}_{i,t}$ is equal to 1 if there is a positive change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Priority Watch List to Watch List, from Watch List to Not Listed, or from Priority Watch List to Not Listed); $\text{WEAKER\_ACE}_{i,t}$ is equal to 1 if there is a negative change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Watch List to Priority Watch List, from Not Listed to Watch List, or from Not Listed to Priority Watch List). The sample period is from 1993 to 2014.

Panel B of this table reports regressions of counterfeit enforcement in the pharmaceutical industry on Special 301 listings. In columns 1, 2, 4, and 5, we run regressions using the following specification:

$$Y_{j,t} = \alpha + \beta_1 \times \text{PHARMA\_DRIVEN\_SPECIAL\_301}_{j,t} + \beta_2 \times \text{SPECIAL\_301\_UNRELATED\_TO\_PHARMA}_{j,t} + \delta_t + \varepsilon_{j,t},$$

where $Y_{j,t}$ denotes the log number of arrests related to counterfeit pharmaceuticals or the log economic value (in USD) of seized counterfeit pharmaceuticals in year t in foreign country j; $\text{PHARMA\_DRIVEN\_SPECIAL\_301}_{j,t}$ is equal to 1 if foreign country j is listed in Special 301 Reports in year t due to counterfeiting problems related to pharmaceuticals; $\text{SPECIAL\_301\_UNRELATED\_TO\_PHARMA}_{j,t}$ is equal to 1 if foreign country j is listed in Special 301 Reports in year t but not due to counterfeiting problems related to pharmaceuticals; and δ_t controls for year fixed effects. In columns 3 and 6, we include $\text{PHARMA\_DRIVEN\_PRIORITY\_WATCH\_LIST}_{j,t}$ and $\text{PHARMA\_DRIVEN\_WATCH\_LIST}_{j,t}$ to control whether a given country was watch listed or priority watch listed due to counterfeit pharmaceuticals. The sample period is from 2012 to 2014. In both panels, ***, **, or * indicates that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

Panel A. Special 301 Reports and IP Offices

	IP_OFFICE	IP_OFFICE	ΔIP_OFFICE
	1	2	3
$\text{SPECIAL\_301\_INCLUSION}_{j,t}$	0.10**		
	(2.46)		
$\text{PRIORITY\_WATCHLIST}_{j,t}$		0.20***	
		(3.12)	
$\text{WATCHLIST}_{j,t}$		0.07*	
		(1.98)	
$\text{STRONGER\_ACE}_{j,t}$			−0.00
			(−0.01)
$\text{WEAKER\_ACE}_{j,t}$			0.05**
			(2.61)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
No. of obs.	4,840	4,840	4,840
R^2	0.607	0.609	0.032

Panel B. Special 301 Reports and Counterfeit Enforcement in the Pharmaceutical Industry

	log(ARRESTS)			log(SEIZURES)		
	1	2	3	4	5	6
$\text{PHARMA\_DRIVEN\_SPECIAL\_301}_{j,t}$	1.00***	1.01***		2.82***	2.86***	
	(2.78)	(2.79)		(2.71)	(2.74)	
$\text{SPECIAL\_301\_UNRELATED\_TO\_PHARMA}_{j,t}$		0.10	0.10		0.52	0.52
		(0.65)	(0.65)		(0.88)	(0.89)
$\text{PHARMA\_DRIVEN\_PRIORITY\_WATCH\_LIST}_{j,t}$			1.58**			3.97**
			(2.05)			(2.13)
$\text{PHARMA\_DRIVEN\_WATCH\_LIST}_{j,t}$			0.63**			2.18*
			(2.59)			(1.88)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	660	660	660	660	660	660
R^2	0.103	0.104	0.131	0.051	0.052	0.059

these 2 alternatives has support in data, we conclude that these results collectively suggest that IP office creation, a frequently listed requirement in the 301 Reports, is abnormally high around the time of the 301-listing inclusion.

Our next piece of evidence comes from enforcement activities in the pharmaceutical industry. To that end, we use a novel data set from the Pharmaceutical Security Institute (PSI) on enforcement actions against counterfeit pharmaceuticals around the globe. The PSI's Counterfeit Incident System (CIS) database contains detailed information on global counterfeiting, illegal diversion, and major theft of pharmaceuticals. More specifically, the CIS database contains information on the number of arrests related to counterfeit pharmaceuticals and the economic value of seized counterfeit pharmaceuticals in each foreign country between 2012 and 2014.[28] With this data in hand, we investigate whether enforcement efforts against counterfeit pharmaceuticals increase by running regressions using the following specification:

$$(6)\quad Y_{j,t} = \alpha + \beta_1 \times \text{PHARMA\_DRIVEN\_SPECIAL\_301}_{j,t} + \beta_2 \times \text{SPECIAL\_301\_UNRELATED\_TO\_PHARMA}_{j,t} + \delta_t + \varepsilon_{j,t},$$

where $Y_{j,t}$ denotes the log number of arrests related to counterfeit pharmaceuticals (log(ARRESTS)) or the log economic value (in USD) of seized counterfeit pharmaceuticals (log(SEIZURES)) in year t in foreign country j; PHARMA_DRIVEN_SPECIAL_301$_{j,t}$ is equal to 1 if foreign country j is listed in Special 301 Reports in year t due to counterfeiting problems related to pharmaceuticals; SPECIAL_301_UNRELATED_TO_PHARMA$_{j,t}$ is equal to 1 if foreign country j is listed in Special 301 Reports in year t but not due to counterfeiting problems related to pharmaceuticals; and δ_t controls for year fixed effects. We do not include country-fixed effects because our sample covers only 3 years. In different specifications, we also control for whether a given country was watch listed or priority-watch listed due to counterfeit pharmaceuticals. Our sample in Panel B of Table 8 includes the 220 countries in Panel A.

We report our findings in Panel B of Table 8. As shown in columns 1 and 2, there is a 100% increase in the number of pharmaceutical-counterfeiter arrests after Special 301 inclusion prompted by counterfeit pharmaceuticals. Special 301 inclusion unrelated to counterfeit pharmaceuticals also increases the number of arrests, but the effect is not statistically significant. As shown in column 3, we show that getting priority-watch listed due to counterfeit pharmaceuticals increases the number of arrests by 158%, and getting watch listed due to counterfeit pharmaceuticals increases the number of arrests by 63%. In line with these results, there is a 282% increase in the economic value of seized counterfeit pharmaceuticals after Special 301 inclusions related to counterfeit pharmaceuticals. This effect is particularly large: 397% after priority-watch listing and 218%, after watch listing.

In untabulated analyses, we find that the economic value of all seizures between 2012 and 2014 amounts to more than $3 billion in countries that are listed in Special 301 Reports due to counterfeit pharmaceuticals. This is about 3 times the

[28]Research in medical sciences (e.g., Mackey, Liang, York, and Kubic (2015)) uses a subsample of the CIS data to study the effects of counterfeits on public health risk.

amount in countries that are listed in Special 301 Reports for reasons other than counterfeit pharmaceuticals. Furthermore, our subsample tests show that the majority of seizures (i.e., seizures with the majority of arrests and the highest economic value of items recovered) occur in countries with active IP offices. These additional results are available upon request; they highlight the importance of IP offices and confirm the usefulness of Special 301 Reports for anti-counterfeiting in foreign markets.

Collectively, the findings presented in this section show that Special 301 listings are associated with more IP offices and stronger enforcement against counterfeiters in foreign countries. This being said, one challenge we face is related to how much of the changes in business outcomes are driven by enforcement actions. More specifically, in addition to resulting in stronger enforcement, Special 301 actions can also distort counterfeiting activities by increasing the costs of manufacturing good counterfeits – for example, due to more media attention and/or customer awareness.

VI. Additional Analysis

This section presents results from additional tests on brand metrics. In Section VI.A, we report the ramifications of anti-counterfeiting enforcement on non-U.S. brands. In Section VI.B, we rerun our regressions on brand asset scores after excluding industries that are most likely to suffer from counterfeiting activities in a given foreign country. Section VI.C presents our findings on how anti-counterfeiting enforcement efforts in China influence operations of U.S. firms in other countries, and Sections VI.D and VI.E provide discussions on endogeneity concerns.

A. Brand Values of Non-U.S. Firms

Our analyses in Section V focus on publicly traded U.S. firms that have brand recognition in overseas markets. Because anti-counterfeiting enforcement is non-excludable, non-U.S. firms may also benefit or suffer from Special 301 actions. Therefore, we also study the ramifications of Special 301 Reports on non-U.S. firms. To do so, we rerun specifications (1) and (2) on the non-U.S. BAV sample and present our findings in Table 9.

As shown in columns 1–5 of Table 9, after controlling for firm and year fixed effects, a given corporation attains brand asset scores that are 2.79 units lower in foreign countries included on the Special 301 Watch List and 5.48 units lower in foreign countries included on the Priority Watch List. These amount to reductions of 5.08% and 9.98% relative to the sample mean, respectively. They are therefore comparable to the reductions experienced by U.S. firms in terms of economic magnitude (a reduction of 4.28% in Watch List countries and a reduction of 9.09% in Priority Watch List countries). Moreover, as shown in column 6, if a given country has stronger anti-counterfeiting enforcement, brand asset scores of corporations increase on average by 0.35 units in that country.

In contrast, if a given country has weaker anti-counterfeiting enforcement, brand asset scores of corporations decrease on average by 0.18 units in that country.

TABLE 9

Impact of Special 301 Reports on Brand Asset Values of Non-U.S. Firms

Table 9 reports regressions of BAV brand asset scores on enforcement against counterfeiting activities around the globe. The sample includes all non-U.S. firms reported in the BAV database. We exclude all countries that are reported in Special 301 Reports but that do not have problems related to counterfeit products. In columns 1–5, we run regressions using the following specification:

$$Y_{i,j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} + \beta_2 \times \text{WATCHLIST}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $Y_{i,j,t}$ denotes the brand asset value of firm i in year t in country j; $\text{PRIORITY\_WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Priority Watch List country by the USTR; and $\text{WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Watch List country by the USTR. In columns 6–10, we run regressions using the following specification:

$$\Delta Y_{i,j,t} = \alpha + \beta_1 \times \text{STRONGER\_ACE}_{j,t} + \beta_2 \times \text{WEAKER\_ACE}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $\Delta Y_{i,j,t}$ denotes changes in the brand asset value of firm i from year $t-1$ to year t in country j; $\text{STRONGER\_ACE}_{j,t}$ is equal to 1 if there is a positive change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Priority Watch List to Watch List, from Watch List to Not Listed, or from Priority Watch List to Not Listed); and $\text{WEAKER\_ACE}_{j,t}$ is equal to 1 if there is a negative change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Watch List to Priority Watch List, from Not Listed to Watch List, or from Not Listed to Priority Watch List). Firms are publicly listed corporations from the BAV universe, spanning all BAV surveys carried out around the globe between 1993 and 2014. ***, **, or * indicates that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

	$\text{BRAND\_ASSET\_VALUE}_{i,j,t}$					$\Delta\text{BRAND\_ASSET\_VALUE}_{i,j,t}$				
	1	2	3	4	5	6	7	8	9	10
PRIORITY_WATCHLIST$_{j,t}$	−5.48*** (−8.85)	−2.78*** (−3.76)	−5.43*** (−8.79)	−5.55*** (−7.91)	−1.50*** (−5.28)					
WATCHLIST$_{j,t}$	−2.79*** (−5.75)	−1.62*** (−2.71)	−2.78*** (−5.75)	−2.92*** (−5.26)	−0.48** (−2.21)					
STRONGER_ACE$_{j,t}$						0.35*** (2.83)	0.38*** (3.06)	0.37*** (2.99)	0.36*** (2.72)	0.44*** (3.02)
WEAKER_ACE$_{j,t}$						−0.18* (−1.78)	−0.17* (−1.66)	−0.19* (−1.85)	−0.27*** (−2.62)	−0.18 (−1.61)
Firm FE	Yes	No	Yes	No	No	Yes	No	Yes	No	No
Year FE	Yes	No	No	No	No	Yes	No	No	No	No
Industry-Year FE	No	Yes	Yes	No	No	No	Yes	Yes	No	No
Firm-Year FE	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Firm-Country FE	No	No	No	No	Yes	No	No	No	No	Yes
No. of obs.	71,022	71,022	71,022	71,022	71,022	65,325	65,325	65,325	65,325	65,325
R^2	0.473	0.149	0.483	0.521	0.936	0.038	0.024	0.054	0.270	0.323

These results are statistically and economically significant and robust to controlling for firm-fixed effects and year-fixed effects. Once again, we obtain comparable results when we include industry-year fixed effects, firm-year fixed effects, and both firm-year and firm-country fixed effects. Our findings in this section suggest that non-U.S. brands also suffer when they are exposed to counterfeiting activities, and their brand values also benefit from U.S. anti-counterfeiting enforcement.

B. Brand Values of Firms from Sectors that Are Excluded from Special 301 Actions

This section presents results from our second out-of-sample investigation on brands. As a further robustness test, we rerun specifications (1) and (2) after excluding the U.S. firms in industries that are identified in Special 301 Reports as the industries that are most likely to suffer from counterfeit activity in a given foreign country. As shown in columns 1–5 of Table 10, a given U.S. firm attains a brand asset score that is 2.26 units lower in countries included on the Special 301 Watch List and 5.15 units lower in countries included on the Special 301 Priority Watch List. Moreover, as shown in column 6 of Table 10, if a given foreign country has stronger anti-counterfeiting enforcement, brand asset scores of U.S.

TABLE 10

Exclusion of Affected Sectors

Table 10 reports regressions of BAV brand asset scores on global developments in anti-counterfeiting enforcement. We report regressions using a restricted sample that excludes all industries that are directly impacted by counterfeit exposure as reflected by USTR comments. In columns 1–5, we run regressions using the following specification:

$$Y_{i,j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} + \beta_2 \times \text{WATCHLIST}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $Y_{i,j,t}$ denotes the brand asset value of firm i in year t in country j; $\text{PRIORITY\_WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Priority Watch List country by the USTR; and $\text{WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Watch List country by the USTR. In columns 6–10, we run regressions using the following specification:

$$\Delta Y_{i,j,t} = \alpha + \beta_1 \times \text{STRONGER\_ACE}_{j,t} + \beta_2 \times \text{WEAKER\_ACE}_{j,t} + \text{Fixed effects} + \varepsilon_{i,j,t},$$

where $\Delta Y_{i,j,t}$ denotes changes in the brand asset value of firm i from year $t-1$ to year t in country j; $\text{STRONGER\_ACE}_{j,t}$ is equal to 1 if there is a positive change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Priority Watch List to Watch List, from Watch List to Not Listed, or from Priority Watch List to Not Listed); $\text{WEAKER\_ACE}_{j,t}$ is equal to 1 if there is a negative change in anti-counterfeiting enforcement in country j from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Watch List to Priority Watch List, from Not Listed to Watch List, or from Not Listed to Priority Watch List). Firms are publicly listed corporations from the BAV universe, spanning all BAV surveys carried out around the globe between 1993 and 2014. ***, **, or * indicates that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

	$\text{BRAND\_ASSET\_VALUE}_{i,j,t}$					$\Delta\text{BRAND\_ASSET\_VALUE}_{i,j,t}$				
	1	2	3	4	5	6	7	8	9	10
$\text{PRIORITY\_WATCHLIST}_{j,t}$	−5.15***	−2.66**	−5.30***	−5.05***	−3.35***					
	(−5.36)	(−2.02)	(−5.55)	(−4.85)	(−7.52)					
$\text{WATCHLIST}_{j,t}$	−2.26***	−1.91*	−2.51***	−2.41***	−0.95***					
	(−2.78)	(−1.73)	(−3.14)	(−2.76)	(−2.80)					
$\text{STRONGER\_ACE}_{j,t}$						0.61***	0.63***	0.63***	0.63***	0.76***
						(2.99)	(3.11)	(3.13)	(3.08)	(3.42)
$\text{WEAKER\_ACE}_{j,t}$						−0.37**	−0.39**	−0.39**	−0.41**	−0.29
						(−2.08)	(−2.16)	(−2.19)	(−2.22)	(−1.41)
Firm FE	Yes	No	Yes	No	No	Yes	No	Yes	No	No
Year FE	Yes	No	No	No	No	Yes	No	No	No	No
Industry-year FE	No	Yes	Yes	No	No	No	Yes	Yes	No	No
Firm-year FE	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Firm-country FE	No	No	No	No	Yes	No	No	No	No	Yes
No. of obs.	22,705	22,705	22,705	22,705	22,705	19,305	19,305	19,305	19,305	19,305
R^2	0.600	0.262	0.615	0.647	0.951	0.047	0.055	0.083	0.244	0.295

firms increase on average by 0.61 units in that foreign country. In contrast, if a given foreign country has weaker anti-counterfeiting enforcement, brand asset scores of U.S. firms decrease on average by 0.37 units in that foreign country.

Results presented in this section are robust to firm-year and firm-country fixed effects and are in line with our previously presented findings (see, e.g., Panel B of Table 6 and Panel B of Table 7). They reinforce the idea that the findings of our article are not fully driven by lobbying activities of firms that are most likely to benefit from counterfeit enforcement overseas. Our findings also suggest that anti-counterfeiting enforcement efforts have a positive externality on the brand asset values of firms that are not explicitly mentioned in Special 301 reports.

C. Anti-Counterfeiting Enforcement in China

In this section, we study how anti-counterfeiting enforcement efforts in China influence brand scores of U.S. firms in other foreign countries. As previously shown in Table 4, anti-counterfeiting enforcement efforts do not significantly impact nonlisted neighboring countries on average. Nevertheless, enforcement in China can have a broader and stronger influence since China is the world's leading source of production, sale, and export of counterfeit goods (see, e.g., the following USTR's Special 301 Report: https://ustr.gov/sites/default/files/2020_Special_301_

Report.pdf). To that end, we study how brand scores of U.S. firms change when the scrutiny of anti-counterfeiting enforcement in China increases, decreases, or remains constant.

Stronger anti-counterfeiting enforcement in China can help U.S. brands in other foreign countries if China's counterfeit exports to these foreign countries drop and this void is not filled. Although China has a record of curbing domestic counterfeit sales after U.S. enforcement, the USTR's statements about China's counterfeit exports paint a different picture. For example, the USTR reported in 1996 that China (soon to be moved to a better USTR designation) "has made some progress in halting the retail trade in infringing goods, but has failed to stop illegal CD, video and CD-ROM production at some 31 plants operating in China to prevent the export of infringing goods."[29]

If stronger anti-counterfeiting enforcement measures in China drive Chinese counterfeit sales or production channels to alternative countries, we should observe deterioration in the brand scores of U.S. firms in these locations under the substitution effects hypothesis. In short, which of the above effects prevails is an empirical question. Moreover, the estimated effects will likely vary across countries, depending on the scrutiny of their anti-counterfeiting enforcement efforts. For example, given the costs and benefits of counterfeiting, counterfeiters may strategically shift their activities to foreign countries that already provide a fertile ground for counterfeiting.

To provide empirical evidence on the above questions, we run regressions using the following specification:

$$
\begin{aligned}
(7)\quad \Delta Y_{i,j,t} = {} & \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} \times \text{STRONGER\_ENF\_IN\_CHINA}_t \\
& + \beta_2 \times \text{PRIORITY\_WATCHLIST}_{j,t} \times \text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t \\
& + \beta_3 \times \text{PRIORITY\_WATCHLIST}_{j,t} \times \text{WEAKER\_ENF\_IN\_CHINA}_t \\
& + \beta_4 \times \text{WATCHLIST}_{j,t} \times \text{STRONGER\_ENF\_IN\_CHINA}_t \\
& + \beta_5 \times \text{WATCHLIST}_{j,t} \times \text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t \\
& + \beta_6 \times \text{WATCHLIST}_{j,t} \times \text{WEAKER\_ENF\_IN\_CHINA}_t \\
& + \text{Fixed effects} + \varepsilon_{i,j,t},
\end{aligned}
$$

where $\Delta Y_{i,j,t}$ denotes changes in brand asset value, brand profit margin, market penetration, customer loyalty, brand awareness, or brand inventiveness score of firm i from year $t-1$ to year t in country j. $\text{STRONGER\_ENF\_IN\_CHINA}_t$ is equal to 1 if there is a positive change in anti-counterfeiting enforcement in China from year $t-1$ to year t, as reflected in USTR Special 301 Reports. $\text{WEAKER\_ENF\_IN\_CHINA}_t$ is equal to 1 if there is a negative change in anti-counterfeiting enforcement in China from year $t-1$ to year t.[30] $\text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t$ is equal to 1 if China's USTR listing status does not change from year

[29]Meanwhile, Paraguay (another listed country) became "a piracy center in South America, particularly in production of sound recordings and entertainment software… [and] a transshipment center for pirate goods originating in China."

[30]STRONGER_ENF_IN_CHINA equals 1 in 1993 and 1997, and WEAKER_ENF_IN_CHINA equals 1 in 1995, 1996, and 2005.

$t-1$ to year t. PRIORITY_WATCHLIST$_{j,t}$ and WATCHLIST$_{j,t}$ are the same as in specification (1).

We present our findings in Table 11. In Panel A, the results in columns 1–5 suggest that brand assets of U.S. firms deteriorate by 0.58 to 0.82 units in Priority Watch List (PWL) countries when there is no change in Chinese enforcement (e.g., China remains a PWL country). The deterioration in brand assets of U.S. firms amplifies when there are stronger enforcement efforts in China. Across different specifications, the estimated coefficients of interest, on PRIORITY_WATCHLIST$_{j,t}$ × STRONGER_ENF_IN_CHINA$_t$, remains statistically significant and economically meaningful, with estimates ranging from −3.39 to −3.73. These figures correspond to changes of −6.25% and −6.88% relative to the sample mean, respectively.

We also find that U.S. firms attain brand asset scores that are 0.01 to 0.06 units lower in Watch List (WL) countries when there is no change in the scrutiny of Chinese enforcement, but these coefficients are not statistically significant. Nonetheless, when there are stronger enforcement efforts in China, U.S. firms observe reductions in their brand asset scores of 2.91 to 3.17 units in WL countries. This suggests that U.S. brands are also impacted in WL countries when there is stronger enforcement in China. Although it is difficult to nail down causality, these findings collectively suggest that anti-counterfeiting enforcement in China can influence U.S. brands that operate in PWL and WL countries around the globe.

Our data on brand metrics provide insights into economic mechanisms. In Panel B of Table 11, for example, we show that market penetration, customer loyalty, brand inventiveness, and brand awareness of U.S. brands also decline in WL and PWL countries (relative to nonlisted foreign countries) after stronger anti-counterfeiting enforcement in China. Overall, these findings suggest that when enforcement increases in China, U.S. brands are perceived to innovate less, fail to produce products that are relevant to consumers' needs, and suffer from reductions in customer loyalty in these markets.

We identify reductions in brand awareness when enforcement in China weakens. This is in line with the notion that Chinese counterfeiters help foreign customers become more aware of U.S. products as they copy and export them. When enforcement in China is weaker – that is, when Chinese counterfeiters can concentrate more on domestic sales – brand awareness in other foreign countries may deteriorate. That being said, higher brand awareness does not necessarily imply more customers or provide direct evidence for the advertising effect hypothesis. In particular, foreign customers may know more about a U.S. brand because they hear about counterfeiting problems related to that brand or media coverage of counterfeits. This does not directly suggest that they will become future customers of U.S. brands, which is what the advertising effect argues.

Collectively, the results presented in this section highlight the distortionary effects of Chinese counterfeiting enforcement on U.S. brands that operate in WL and PWL countries. In untabulated regressions, we examine the effect of Chinese counterfeiting enforcement on non-U.S. brands in foreign countries as well. In so doing, we obtain a −1.71 (t-stat. = −3.03) unit reduction in brand asset scores of non-U.S. firms in countries listed in Special 301 Reports (WL and PWL countries combined). This finding is robust to controlling for firm-year and firm-country fixed effects as in column 5 of Table 11.

TABLE 11

How Anti-Counterfeiting Enforcement Efforts in China Influence U.S. Brands Operating in Other Regions

Table 11 reports how anti-counterfeiting enforcement efforts in China influence brand scores of U.S. firms in other foreign countries. We run regressions using the following specification:

$$\Delta Y_{i,j,t} = \alpha + \beta_1 \times \text{PRIORITY\_WATCHLIST}_{j,t} \times \text{STRONGER\_ENF\_IN\_CHINA}_t + \beta_2 \times \text{PRIORITY\_WATCHLIST}_{j,t} \times \text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t + \beta_3 \times \text{PRIORITY\_WATCHLIST}_{j,t} \times \text{WEAKER\_ENF\_IN\_CHINA}_t + \beta_4 \times \text{WATCHLIST}_{j,t} \times \text{STRONGER\_ENF\_IN\_CHINA}_t + \beta_5 \times \text{WATCHLIST}_{j,t} \times \text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t + \beta_6 \times \text{WATCHLIST}_{j,t} \times \text{WEAKER\_ENF\_IN\_CHINA}_t + \text{Fixed effects} + \varepsilon_{i,j,t}.$$

$\Delta Y_{i,j,t}$ denotes changes in the brand asset value (brand profit margin, market penetration, customer loyalty, brand awareness, or brand inventiveness) of firm i from year $t-1$ to year t in country j in Panel A (Panel B). We exclude brand surveys from China. $\text{PRIORITY\_WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Priority Watch List country by the USTR; and $\text{WATCHLIST}_{j,t}$ is equal to 1 if country j is listed as a Watch List country by the USTR. $\text{STRONGER\_ENF\_IN\_CHINA}_t$ is equal to 1 if there is a positive change in anti-counterfeiting enforcement in China from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Priority Watch List to Watch List, from Watch List to Not Listed, or from Priority Watch List to Not Listed). $\text{WEAKER\_ENF\_IN\_CHINA}_t$ is equal to 1 if there is a negative change in anti-counterfeiting enforcement in China from year $t-1$ to year t, as reflected in USTR Special 301 Reports (i.e., country status changes from Watch List to Priority Watch List, from Not Listed to Watch List, or from Not Listed to Priority Watch List). $\text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t$ denotes no change in China's USTR designation. Brand metrics are explained in detail in Section III. Firms are publicly listed corporations from the BAV universe, spanning all BAV surveys carried out around the globe between 1993 and 2014. ***, **, or * indicates that the coefficient estimate is significantly different from 0 at the 1%, 5%, or 10% levels, respectively.

Panel A. Brand Assets

	$\Delta\text{BRAND\_ASSET\_VALUE}_{i,j,t}$				
	1	2	3	4	5
$\text{PRIORITY\_WATCHLIST}_{j,t} \times \text{STRONGER\_ENF\_IN\_CHINA}_t$	−3.43***	−3.40***	−3.39***	−3.40***	−3.73***
	(−3.17)	(−3.06)	(−3.09)	(−3.37)	(−3.63)
$\text{PRIORITY\_WATCHLIST}_{j,t} \times \text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t$	−0.58***	−0.57***	−0.59***	−0.60***	−0.82***
	(−5.20)	(−4.83)	(−5.29)	(−5.33)	(−4.20)
$\text{PRIORITY\_WATCHLIST}_{j,t} \times \text{WEAKER\_ENF\_IN\_CHINA}_j$	−0.46	−0.52	−0.45	−0.49	−0.64*
	(−1.28)	(−1.44)	(−1.25)	(−1.29)	(−1.67)
$\text{WATCHLIST}_{j,t} \times \text{STRONGER\_ENF\_IN\_CHINA}_t$	−3.17***	−3.14***	−3.07***	−2.91***	−3.07***
	(−3.99)	(−3.93)	(−3.86)	(−3.61)	(−3.67)
$\text{WATCHLIST}_{j,t} \times \text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t$	−0.01	−0.02	−0.04	−0.06	−0.06
	(−0.09)	(−0.21)	(−0.39)	(−0.65)	(−0.39)
$\text{WATCHLIST}_{j,t} \times \text{WEAKER\_ENF\_IN\_CHINA}_t$	0.11	0.05	0.09	0.17	0.09
	(0.38)	(0.18)	(0.33)	(0.62)	(0.32)
Firm FE	Yes	No	Yes	No	No
Year FE	Yes	No	No	No	No
Industry-year FE	No	Yes	Yes	No	No
Firm-year FE	No	No	No	Yes	Yes
Firm-country FE	No	No	No	No	Yes
No. of obs.	24,207	24,207	24,207	24,207	24,207
R^2	0.043	0.048	0.075	0.227	0.274

Panel B. Components of Brand Perception

	ΔBRAND_PROFIT_MARGIN	ΔMARKET_PENETRATION	ΔCUSTOMER_LOYALTY	ΔBRAND_AWARENESS	ΔBRAND_INVENTIVENESS
	1	2	3	4	5
$\text{PRIORITY\_WATCHLIST}_{j,t} \times \text{STRONGER\_ENF\_IN\_CHINA}_t$	−2.90	−3.73***	−3.45**	−1.23*	−3.28*
	(−1.40)	(−2.81)	(−2.31)	(−1.67)	(−1.77)
$\text{PRIORITY\_WATCHLIST}_{j,t} \times \text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t$	−0.00	−0.62***	−0.96***	−1.01***	0.36
	(−0.00)	(−2.65)	(−3.56)	(−6.52)	(1.00)
$\text{PRIORITY\_WATCHLIST}_{j,t} \times \text{WEAKER\_ENF\_IN\_CHINA}_j$	−1.09	−0.48	−0.16	−0.86***	−1.39*
	(−1.36)	(−1.11)	(−0.31)	(−2.88)	(−1.78)
$\text{WATCHLIST}_{j,t} \times \text{STRONGER\_ENF\_IN\_CHINA}_t$	−3.65**	−2.04*	−3.70***	−1.09*	−1.01
	(−2.17)	(−1.82)	(−2.78)	(−1.86)	(−0.65)
$\text{WATCHLIST}_{j,t} \times \text{NO\_CHG\_IN\_ENF\_IN\_CHINA}_t$	−0.15	0.09	−0.11	−0.00	0.07
	(−0.47)	(0.50)	(−0.50)	(−0.02)	(0.22)
$\text{WATCHLIST}_{j,t} \times \text{WEAKER\_ENF\_IN\_CHINA}_t$	−0.03	0.11	0.56	−0.90***	−0.44
	(−0.04)	(0.33)	(1.37)	(−4.01)	(−0.69)
Firm-Year FE	Yes	Yes	Yes	Yes	Yes
Firm-Country FE	Yes	Yes	Yes	Yes	Yes
No. of obs.	24,207	24,207	24,207	24,207	24,207
R^2	0.231	0.244	0.250	0.288	0.234

D. Potential Effects of Endogenous Nonlobbying Decisions

In this section, we discuss potential ramifications of firms' decision not to lobby. As shown in Sections V and VI, we find economically and statistically similar results after excluding industries and geographic segments that are potentially exposed to industry-level lobbying. We report these findings in Tables 6, 7, and 9. One caveat with this methodology is the possible self-selection into nonlobbying, which can affect our findings in a number of ways. We discuss two possible scenarios below.

First, in line with the advertising effect, nonlobbying firms can benefit from counterfeiting. Under this scenario, we expect the set of firms analyzed in the above tables to be benefitted (hindered) by increases (decreases) in counterfeit exposure. Second, nonlobbying firms can be hindered by counterfeiting but strategically choose to not lobby because they predict that other industries will do the lobbying regardless. For example, if firms in the microSD card industry are certain that firms in the external hard drive industry will lobby against counterfeit memory cards in Turkey, it can be optimal for firms in the microSD card industry to avoid redundantly spending money on lobbying. Under this scenario, the effects we identify would not be purely driven by Special 301 enforcement and could be confounded by nonlobbying firms' ability to substitute their lobbying dollars for capital investment and R&D dollars.

Our empirical findings do not support the first scenario, as we find a positive relationship between anti-counterfeiting enforcement and the valuations of nonlobbying firms. More specifically, as shown in columns 4–6 of Table 7, coefficients for CUSTOMERS_PROTECTED are positive and statistically significant, and coefficients for CUSTOMERS_STILL_EXPOSED are negative and insignificant. Our results on investments and profitability are not fully supportive of this alternative hypothesis, either. Additionally, even though we cannot fully control for selection problems at the firm-country-year level, Table 10 provides additional evidence against this alternative hypothesis after controlling for firm-year and firm-country fixed effects. Overall, brands do not seem to be benefited (hindered) by increases (decreases) in counterfeit exposure.

One piece of evidence we provide to address the second scenario comes from the estimated coefficients for CUSTOMERS_PROTECTED and CUSTOMERS_STILL_EXPOSED in Table 6. As shown in columns 1 and 2 of Panel B, coefficients for CUSTOMERS_STILL_EXPOSED (CUSTOMERS_PROTECTED) are positively (negatively) significant, which contradicts the hypothesis that firms are able to convert lobbying dollars to investments when other firms lobby. In contrast, we find that active counterfeit exposure has a significantly positive influence on R&D investments for nonlobbying firms, which can be explained by counterfeits prompting firms to take a more aggressive investment approach (Caves and Porter (1977)). The following section provides a discussion of additional endogeneity concerns.

E. Other Implications

One possibility is that counterfeits do not lower brand values, but rather companies with low brand values attract more counterfeits because these brands

share a certain set of attributes that make them an easier target for counterfeiters. As presented in Section V, our setting provides an opportunity to test whether valuation changes truly drive counterfeits or vice versa. In particular, we can study whether non-U.S. firms also suffer from the counterfeiting activities affecting U.S. firms and whether enforcement of IP rights that are potentially triggered by the United States also benefits firms of other countries. For example, do Canadian firms benefit, as U.S. firms do, from the increased anti-counterfeit enforcement in Mexico prompted by the United States? We find that indeed, non-U.S. firms also suffer when they are exposed to counterfeit activity, and their brand values also increase when a country's watch list status improves in the Special 301 Reports.

This finding is important because it suggests that, to the extent that changes in a foreign country's anti-counterfeiting enforcement induced by the U.S. government are unexpected by brands of non-U.S. firms, counterfeits drive valuation changes, not the other way around. To a certain degree, this finding also alleviates concerns that the Special 301 Reports are related to or coordinated with other aspects of U.S. trade policies that affect U.S. firms that are involved with the watch-listed foreign countries. Furthermore, excluding firms that were instrumental in drafting national-level legislation or firms that lobby for trade protection from the U.S. government only makes our results stronger, if anything. Although nailing down causality is difficult, these pieces of evidence support the idea that counterfeit activity can affect brand metrics.

There are alternative explanations that help explain the reduction in sales as well. When a country is put on a watchlist, the designated country may treat U.S. firms differently (e.g., harass importers at ports more). Alternatively, the listing may provide information to U.S. firms about counterfeiting activity, causing them to react to the information rather than to the actual counterfeiting. As a consequence, U.S. firms may scale back operations in the country – a different mechanism from the demand-side substitution mechanism for which we argue in the article. Additionally, the U.S. government may discourage firms from selling to the country. Although these arguments help explain why we can observe a decline in sales in countries that are listed, they cannot explain why the brand perceptions also change in that country. Furthermore, we find that, like U.S. firms, non-U.S. firms also suffer from counterfeiting activities and their brand values also increase when a country's watch list designation improves in the Special 301 Reports.

VII. Conclusion

Corporations face risks when they operate in foreign countries, especially in ones that lack strong enforcement against counterfeiting activities. Foreign governments can impose costs directly on international firms with additional taxes and regulations but also indirectly through lax enforcement against counterfeit products. A top trade priority for a government is to use all possible sources of leverage to encourage other countries to provide adequate and effective protection and enforcement against counterfeiting. Given the scope and magnitude of the current counterfeit economy, anti-counterfeiting enforcement can make a material difference to firm success.

In this article, we analyze the effects of a specific government intervention in the international IP protection domain. Specifically, we show that the U.S. government's protection of U.S. corporations from foreign counterfeiters through policies such as Special 301 enforcement has a direct influence on U.S. corporations. Using shocks to anti-counterfeiting enforcement induced by the USTR through watch list designations in Special 301 Reports, we present evidence on how counterfeits affect brand value along with corporate investment, growth, and firm value. We document evidence that U.S. firms significantly reduce capital and R&D investments when their brands are protected from counterfeit activities. Our evidence collectively suggests that the U.S. government policy of anti-counterfeiting enforcement in overseas markets during the past 20 years helped U.S. firms enjoy higher profits through the enhancement of their brand metrics. Our empirical findings are borne out by our data and reduced-form analyses, and they can be more precisely estimated using structural modeling that formulates economic models to explain the observed behaviors.

While we focus on how anti-counterfeiting enforcement affects business outcomes, we believe that our approach can be readily adapted to study other economic transactions. A recent report by United Nations Office on Drugs and Crime states that the production of counterfeit medicines, food, and beverages poses serious risks to consumer health (United Nations Office on Drugs and Crime (2016)). The same report also states that counterfeit producers often violate basic labor rights and working conditions, absent proper regulation. In short, the effect of counterfeits on economic activities stretches far beyond those that we document in this article. Our research could thus be extended to provide novel evidence on the economic impact of counterfeits beyond firm valuation.

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109022001387.

References

Aboody, D., and B. Lev. "The Value Relevance of Intangibles: The Case of Software Capitalization." *Journal of Accounting Research*, 36 (1998), 161–191.

Ailawadi, K. L.; D. R. Lehmann; and S. A. Neslin. "Revenue Premium as an Outcome Measure of Brand Equity." *Journal of Marketing*, 67 (2003), 1–17.

Akdogu, E., and P. MacKay. "Investment and Competition." *Journal of Financial and Quantitative Analysis*, 43 (2008), 299–330.

Akerlof, G. A. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *American Economic Review*, 84 (1970), 488–500.

Arrow, K. "Economic Welfare and the Allocation of Resources for Invention." In *The Rate and Direction of Inventive Activity: Economic and Social Factors*, R. Nelson, ed. Princeton, NJ: Princeton University Press (1962), 609–626.

Bain, J. S. *Barriers to New Competition*. Cambridge, MA: Harvard University Press (1956).

Barth, M. E.; R. Kasznik; and M. F. McNichols. "Analyst Coverage and Intangible Assets." *Journal of Accounting Research*, 39 (2001), 1–34.

Baumol, W. "Contestable Markets: An Uprising in the Theory of Industry Structure." *American Economic Review*, 72 (1982), 1–15.

Bennedsen, M., and S. Zeume. "Corporate Tax Havens and Transparency." *Review of Financial Studies*, 31 (2017), 1221–1264.

Bertrand, M.; M. Bombardini; and F. Trebbi. "Is It Whom You Know or What You Know? An Empirical Assessment of the Lobbying Process." *American Economic Review*, 104 (2017), 3885–3920.
Biais, B., and E. Perotti. "Entrepreneurs and New Ideas." *RAND Journal of Economics*, 39 (2008), 1105–1125.
Bloch, P. H.; R. F. Bush; and L. Campbell. "Consumer 'Accomplices' in Product Counterfeiting." *Journal of Consumer Marketing*, 10 (1993), 27–36.
Borkovsky, R. N.; A. Goldfarb; A. M. Haviv; and S. Moorthy. "Measuring and Understanding Brand Value in a Dynamic Model of Brand Management." *Marketing Science*, 36 (2017), 471–499.
Braithwaite, D. "The Economic Effects of Advertisement." *Economic Journal*, 38 (1928), 16–37.
Bronnenberg, B; J. P. Dubé; M. Gentzkow; and S. Moorthy. "The Economics of Brands and Branding." In *Handbook of the Economics of Marketing*, Vol. 1. Oxford: North-Holland (2019), 291–358.
Bronnenberg, B; J. P. Dubé; M. Gentzkow; and J. M. Shapiro. "Do Pharmacists Buy Bayer? Sophisticated Shoppers and the Brand Premium." *Quarterly Journal of Economics*, 130 (2015), 1669–1726.
Brynjolfsson, E., and M. D. Smith. "Frictionless Commerce? A Comparison of Internet and Conventional Retailers." *Management Science*, 46 (2000), 563–585.
Caves, R. E., and M. E. Porter. "From Entry Barriers to Mobility Barriers: Conjectural Decision and Contrived Deterrence to New Competition." *Quarterly Journal of Economics*, 91 (1977), 241–262.
Chamberlin, E. *The Theory of Monopolistic Competition*. Cambridge, MA: Harvard University Press (1933).
Conner, K. R., and R. P. Rumelt. "Software Piracy: An Analysis of Protection Strategies." *Management Science*, 37 (1991), 125–139.
Cordell, V. V.; R. L. Kieschnick Jr.; and N. Wongtada. "Counterfeit Purchase Intentions: Role of Lawfulness Attitudes and Product Traits as Determinants." *Journal of Business Research*, 35 (1996), 41–53.
De Castro, J. O.; D. B. Balkin; and D. A. Shepherd. "Can Entrepreneurial Firms Benefit from Product Piracy?" *Journal of Business Venturing*, 23 (2008), 75–90.
Denis, D. J.; D. K. Denis; and K. Yos. "Global Diversification, Industrial Diversification, and Firm Value." *Journal of Finance*, 57 (2002), 1951–1980.
Doraszelski, U., and S. Markovich. "Advertising Dynamics and Competitive Advantage." *Rand Journal of Economics*, 38 (2007), 557–592.
Drahos, P., and J. Brathwaite. *Information Feudalism: Who Owns the Knowledge Economy?*, 2nd ed. New York: New Press (2012).
Dubin, J. A. *Studies in Consumer Demand: Econometric Methods Applied to Market Data*. Boston, MA: Kluwer Academic Publishers (1998).
Eberhart, A.; W. Maxwell; and A. Siddique. "An Examination of Long-Term Abnormal Stock Returns and Operating Performance Following R&D Increases." *Journal of Finance*, 59 (2004), 623–650.
Eberhart, A.; W. Maxwell; and A. Siddique. "A Reexamination of the Tradeoff Between the Future Benefit and Riskiness of R&D Increases." *Journal of Accounting Research*, 46 (2008), 27–53.
Farrell, J., and P. Klemperer. "Coordination and Lock-in: Competition with Switching Costs and Network Effects." In *Handbook of Industrial Organization*, Vol 3, M. Armstrong and R. Porter, eds. Amsterdam, Netherlands: Elsevier (2007), 1967–2072.
Fink, C.; K. E. Maskus; and Y. Qian. "The Economic Effects of Counterfeiting and Piracy: A Review and Implications for Developing Countries." *World Bank Research Observer*, 31 (2016), 1–28.
Fudenberg, D., and J. Tirole. "The Fat-Cat Effect, the Puppy-Dog Ploy, and the Lean and Hungry Look." *American Economic Review*, 74 (1984), 361–366.
Giroud, X., and H. M. Mueller. "Corporate Governance, Product Market Competition, and Equity Prices." *Journal of Finance*, 66 (2011), 563–600.
Goldfarb, A.; Q. Lu; and S. Moorthy. "Measuring Brand Value in an Equilibrium Framework." *Marketing Science*, 28 (2008), 69–86.
Grossman, G. M., and J. Shapiro. "Counterfeit-Product Trade." *American Economic Review*, 78 (1988a), 59–75.
Grossman, G. M., and J. Shapiro. "Foreign Counterfeiting of Status Goods." *Quarterly Journal of Economics*, 103 (1988b), 79–100.
Grossman, G. M.; J. Shapiro; and E. Helpman. "Product Development and International Trade." *Journal of Political Economy*, 97 (1989), 1261–1283.
Guo, R. J.; B. Lev; and N. Zhou. "Competitive Costs of Disclosure by Biotech IPOs." *Journal of Accounting Research*, 42 (2004), 319–355.
Han, Y. J.; J. Nunes; and X. Dreze. "Signaling Status with Luxury Goods: The Impact of Brand Prominence." *Journal of Marketing*, 74 (2010), 15–30.
Heath, D., and C. Mace. "The Strategic Effect of Trademark Protection." *Review of Financial Studies*, 33 (2019), 1848–1877.

Hitsch, G. J. "An Empirical Model of Optimal Dynamic Product Launch and Exit Under Demand Uncertainty." *Marketing Science*, 25 (2006), 25–50.
Hoberg, G., and G. M. Phillips. "Product Market Synergies and Competition in Mergers and Acquisitions: A Text-Based Analysis." *Review of Financial Studies*, 23 (2010), 3773–3811.
Hoberg, G., and G. M. Phillips. "Text-Based Network Industries and Endogenous Product Differentiation." *Journal of Political Economy*, 124 (2016), 1423–1465.
Hoberg, G.; G. M. Phillips; and N. Prabhala. "Product Market Threats, Payouts, and Financial Flexibility." *Journal of Finance*, 69 (2014), 293–324.
Khan, B. Z. "Does Copyright Piracy Pay? The Effects of US International Copyright Laws on the Market for Books, 1790–1920." NBER Working Paper No. 10271 (2004).
Klein, B., and K. B. Leffler. "The Role of Market Forces in Assuring Contractual Performance." *Journal of Political Economy*, 89 (1981), 615–641.
Klemperer, P. "Competition When Consumers Have Switching Costs: An Overview with Applications to Industrial Organization, Macroeconomics, and International Trade." *Review of Economic Studies*, 62 (1995), 515–539.
Kothari, S. P.; T. E. Laguerre; and A. J. Leone. "Capitalization Versus Expensing: Evidence on the Uncertainty of Future Earnings from Capital Expenditures Versus R&D Outlays." *Review of Accounting Studies*, 7 (2002), 355–382.
Kwong, K.; O. Yau; J. Lee; L. Sin; and A. Tse. "The Effects of Attitudinal and Demographic Factors on Intention to Buy Pirated CDs: The Case of Chinese Consumers." *Journal of Business Ethics*, 47 (2003), 223–235.
Larkin, Y. "Brand Perception, Cash Flow Stability, and Financial Policy." *Journal of Financial Economics*, 110 (2013), 232–253.
Lev, B. *Intangibles: Management, Measurement, and Reporting*. Washington, DC: Brookings Institution Press (2000).
Lev, B. "The Deteriorating Usefulness of Financial Report Information and How to Reverse It." *Accounting and Business Research*, 48 (2018), 465–493.
Mackey, T. K.; B. A. Liang; P. York; and T. Kubic. "Counterfeit Drug Penetration into Global Legitimate Medicine Supply Chains: A Global Assessment." *American Journal of Tropical Medicine and Hygiene*, 92 (2015), 59–67.
Mayer, T., and S. Zignago. "Notes on CEPII's Distances Measures: The GeoDist Database." CEPII Working Paper No. 2011-25 (2005).
McDevitt, R. C. "A Business by Any Other Name: Firm Name Choice as a Signal of Firm Quality." *Journal of Political Economy*, 122 (2014), 909–944.
Olsen, J. E., and K. L. Granzin. "Gaining Retailers' Assistance in Fighting Counterfeiting: Conceptualization and Empirical Test of a Helping Model." *Journal of Retailing*, 68 (1992), 90–109.
Qian, Y. "Impacts of Entry by Counterfeiters." *Quarterly Journal of Economics*, 123 (2008), 1577–1609.
Qian, Y. "Brand Management and Strategies Against Counterfeits." *Journal of Economics and Management Strategy*, 23 (2014a), 317–343.
Qian, Y. "Counterfeiters: Foes or Friends." *Management Science*, 60 (2014b), 2381–2400.
Raustiala, K., and C. Springman. *The Knockoff Economy: How Imitation Sparks Innovation*. Oxford: Oxford University Press (2012).
Shapiro, C. "Premiums for High Quality Products as Returns to Reputations." *Quarterly Journal of Economics*, 98 (1983), 659–679.
Spink, J.; D. C. Moyer; H. Park; and J. Heinonen. "Defining the Types of Counterfeiters, Counterfeiting, and Offender Organizations." *Crime Science*, 2 (2013), 1–10.
Stoughton, N. M.; K. P. Wong; and L. Yi. "Investment Efficiency and Product Market Competition." *Journal of Financial and Quantitative Analysis*, 52 (2017), 2611–2642.
Sundaram, A. K.; T. A. John; and K. John. "An Empirical Analysis of Strategic Competition and Firm Values: The Case of R&D Competition." *Journal of Financial Economics*, 40 (1996), 459–486.
Tom, G.; B. Garibaldi; Y. Zeng; and J. Pilcher. "Consumer Demand for Counterfeit Goods." *Psychology and Marketing*, 15 (1998), 405–421.
United Nations Office on Drugs and Crime. "Annual Report." Available at: https://www.unodc.org/documents/AnnualReport2016/2016_UNODC_Annual_Report.pdf (2016).
Wee, C.; S. Tan; and K. Cheok. "Non-Price Determinants of Intention to Purchase Counterfeit Goods." *International Marketing Review*, 12 (1995), 1–46.
Wilcox, K.; H. M. Kim; and S. Sen. "Why Do Consumers Buy Counterfeit Luxury Brands?" *Journal of Marketing Research*, 66 (2009), 247–259.