

Submarine Trademarks*

Carsten Fink^a

Andrea Fosfuri^b

Christian Helmers^{c†} Amanda F. Myers^d

^a World Intellectual Property Organization (WIPO)

^b Bocconi University

^c Santa Clara University

^d U.S. Patent and Trademark Office (USPTO)

February 15, 2019

ABSTRACT

Companies use trademarks to protect their brands from outright imitation or competition by confusingly similar products. However, publication of trademark filings by the trademark office discloses information about a firm's new product or service. This creates a trade-off between legal protection and disclosure of information. We analyze the trade-off through the lens of "submarine trademarks" in the U.S. – submarine trademarks are trademarks whose publication and hence disclosure to the public is strategically delayed. This is achieved through a particular international filing strategy that is often combined with the use of shell companies to further conceal the trademark filing. These submarine strategies allow companies to benefit from legal trademark protection while reducing the risk of inadvertent disclosure of information. We provide the first systematic evidence of submarine trademarks and explore both their determinants and their effectiveness in reducing the disclosure of information.

KEYWORDS: Trademark, submarine, strategic behavior, secrecy, product innovation

JEL Classification: D22, M30, K11, O34

*We thank Barton Beebe, Dev Gangjee, Eric Goldman, and seminar/conference participants at the Oxford Intellectual Property Research Centre, Santa Clara University, the USPTO, IPSDM 2017, the Munich Summer Institute 2018, IPSC 2018, and WIPO for their useful comments and suggestions. We thank especially Hakki Dogan Dalay for excellent research assistance. The views expressed in this paper are those of the authors and do not reflect those of WIPO or USPTO.

†Corresponding author: chelmers@scu.edu

1 Introduction

Companies legally protect their brands from outright imitation or competition by confusingly similar products through trademarks. Trademarks are, by far, the most widely used form of intellectual property (IP) with nearly 7 million trademark filings worldwide in 2016 as opposed to less than 3.1 million patent filings.¹ Research in marketing and finance has shown how firms benefit from protecting their brands through trademark registration: trademark stocks are positively correlated with financial performance (Krasnikov, Mishra and Orozco, 2009) and firm value (Greenhalgh and Rogers, 2012; Edeling and Fischer, 2016); trademark filings and their enforcement elicit positive stock market reactions (Fosfuri and Giarratana, 2009; Ertekin, Sorescu and Houston, 2018); and trademark holdings help start-ups secure funding from venture capitalists (Block et al, 2014). More recent research on innovation economics indicates that filing to register a trademark is highly correlated with firm growth (Dinlersoz et al., 2018) and the ultimate success of start-ups (Fazio et al., 2016).

However, legal protection in the form of a registered trademark comes at a cost: public disclosure of a new trademark filing might reveal strategic information to competitors. When the motivation behind a trademark application is to protect a new product or service, a public trademark filing effectively serves as a product announcement, revealing a firm's product development plan to the market and competitors (Fosfuri and Giarratana, 2009). Indeed, to protect a trademark through federal registration in the United States, firms and individuals have to file an application directly with the U.S. Patent and Trademark Office (USPTO).² Upon filing, the application is disclosed to the public almost immediately via an online database that makes the trademark visible and easily searchable.³ The product name alone, as in the case of *Apple Watch*, can indicate a novel addition to a company's product portfolio. Moreover, companies must describe in some detail the product or service the trademark seeks to protect in the ap-

¹The number of trademark filings refers to class counts, that is applications are counted once for each class they cover. Data source: World Intellectual Property Organization (WIPO).

²Trademark protection in the United States does not require federal registration; protection is also available through common law. However, registration confers a number of important benefits, which are explained in Section 3.1. Note that firms can file to register a trademark through the so-called Madrid System established under the Madrid Agreement Concerning the International Registration of Marks and the Protocol Relating the Madrid Agreement, which is administered by the World Intellectual Property Organization (WIPO). The Madrid system offers a streamlined process for obtaining trademark registration in countries that are part of the system through a single application in a single language. That said, applications filed through the Madrid system still have to be approved and registered by the national offices designated by the applicant and, once registered, trademarks are subject to national law.

³An incoming application has to meet certain minimal requirements to receive a filing date. See Trademark Manual of Examining Procedure (TMEP) §202. Review of compliance with the minimum requirements can extend the lag between filing and public disclosure. Generally, however, an application appears in the USPTO's online trademark database within days of filing.

plication. This information may prompt competitors to adjust or accelerate their own product development plans. In other words, early disclosure may expedite imitation by competitors, undermining a company's first-mover advantage. A firm has to weigh the benefits from trademark protection against the benefits from secrecy, a tradeoff that has only been investigated in the patent literature (see, for instance, Kultti, Takalo and Toikka, 2007).

This is not just a theoretical possibility. Anecdotal evidence suggests intensifying use of the trademark online databases for market intelligence. On July 16, 2017, for example, news broke that Amazon had filed a trademark application on July 6 for the slogan '*We do the prep. You be the chef.*' for the sale of meal kits ('Prepared food kits composed of meat, poultry, fish, seafood, fruit...ready for cooking and assembly as a meal').⁴ Before noon the following day, shares in Blue Apron Holdings Inc. fell 9.4%, while Amazon.com Inc. shares rose 1%.⁵ Shortly thereafter, on August 14, 2017, [Smithfield Foods announced](#) a strategic investment in Chef'd, a 'best-in-class e-commerce meal marketplace.' Albertsons, one of the largest grocery retailers in the U.S., [announced the acquisition](#) of Plated, a 'premier meal kit service' on September 20, 2017. Later in May of 2018, grocery retailer [Kroger announced](#) a merger with private meal kit company Home Chef. While remarkable for the market destabilizing aftermath, this is not an isolated incident. Financial and trade press outlets leverage trademark filings to speculate on the new product offerings of tech companies,⁶ video game developers,⁷ car manufacturers,⁸ sports franchises,⁹ celebrities,¹⁰ etc. Market intelligence gathering is not limited to the USPTO trademark database but extends globally to include the online databases of key markets in Europe and Asia.¹¹

As trademark-based market intelligence proliferates, firms are faced with the choice between securing legal protection for new products and brands and inadvertent infor-

⁴U.S. Application Serial No. 87517760. A [British-based publication](#) first reported on the trademark filing on July 16, 2017. Business and financial [news outlets](#) quickly followed suite.

⁵<https://www.bloomberg.com/news/articles/2017-07-17/blue-apron-plummets-after-amazon-files-for-meal-kit-trademark>.

⁶Apple, in particular, has been subject to targeted and continuous monitoring from such sites as [www.macrumors.com](#) and [www.patentlyapple.com](#).

⁷Among others, [www.gamespot.com](#), monitors trademark filings relevant to the video gaming industry. See, e.g., <https://www.gamespot.com/articles/gta-online-gets-new-trademarks/1100-6456994/>.

⁸Trade press sites report on trademark applications by major automotive manufactures, including [Ford](#) and [Toyota](#).

⁹See, e.g., <https://chiefswire.usatoday.com/2018/05/21/chiefs-file-trademarks-for-kc-blonde-ale-and-kingdom-blonde-ale>.

¹⁰See, e.g., <https://www.thewrap.com/meryl-streep-files-trademark-for-her-own-name>.

¹¹See, e.g., <https://nintendoeverything.com/latest-japanese-nintendo-trademarks/>, <https://www.autoguide.com/auto-news/2018/07/corneringstone-hyundai-styx-name-reserved-eu.html>, and <https://www.theverge.com/2017/5/20/15669982/amazon-go-checkout-free-grocery-stores-europe-trademark>.

mation disclosure. A hand-full of prominent tech companies, particularly *Apple*, have adopted a novel strategy for evading this trade-off by strategically delaying public disclosure via a ‘submarine’ trademark filing. For example, when Apple launched its *Apple Watch* on September 9, 2014, it first filed the corresponding trademark application in Trinidad and Tobago on March 11, 2014, establishing a priority right six months before the U.S. application was filed on the product launch date.¹² Because Trinidad and Tobago does not have a searchable online trademark database, Apple’s priority application only surfaced when the company filed to register the trademark at the USPTO. In other words, this submarine filing strategy allowed Apple to establish an exclusive worldwide right to its new product brand name half a year before revealing it to the public and its competitors. Apple is not unique in pursuing this strategy. Other high-profile companies, such as Amazon and T-Mobile, also file submarine trademark applications, often in combination with the use of shell companies to disguise their filings even after they are disclosed online by the USPTO.

The simple observation that some companies spend significant resources to delay disclosure of trademark filings while securing early legal protection suggests that there are substantial benefits to keeping information about new products secret before the formal launch. Why then do companies not simply file to register their trademarks just before they introduce new products or brand names to the market? Companies face multiple risks if they delay a trademark filing until the new product is officially announced. One potential risk is conflict with previously registered trademarks. This risk arises from accidental ‘shoulder rubbing’, whereby other companies file applications to register the same or similar trademarks. For the later filer, conflict with a prior filing may prohibit registration and force re-branding. Such difficulties in registering desired trademarks might then affect a firm’s competitive stance in the product market. Increasingly crowded trademark registries have exacerbated this risk (Beebe and Fromer, 2018) and may be prompting more innovative mitigation strategies, including submarine filing.¹³ A second, more pernicious, risk of delaying a trademark application filing is posed by trademark squatters. These are individuals or companies who apply

¹²Apple filed three separate applications to register *Apple Watch* in different classes (U.S. Application Serial Nos. 86389914, 86389945, and 86390028). Each application was first filed in Trinidad and Tobago on March 11, 2014 and at the USPTO on September 9, 2014 via the Paris Convention for the Protection of Industrial Property. As explained further in Section 3.2, under the Paris Convention, the United States and other member states will accept the priority claim of applications first filed in signatory jurisdictions. The Paris Convention was first concluded in 1884. Its membership is almost universal, with 177 countries having signed the Convention as of February 2018. After filing at USPTO, Apple extended the U.S. applications, with the March 11, 2014 priority date, to three international applications through the Madrid System.

¹³Companies may also perform exhaustive pre-filing clearance searches to ensure the availability of a proposed trademark, invest in highly original trademarks with lower risk of prior conflicts, pursue parallel applications to hedge against potential conflicts, or simply acquire the conflicting trademark.

to register trademarks on brands commercialized by established market participants (Fink et al., 2018). Squatters do not intend to use the trademarks in commerce but, rather, aim to extract rents from the actual brand owner through licensing or acquisition. The six month submarine period allows companies to obtain exclusive rights in jurisdictions where squatting concerns are strong prior to filing a publicly-viewable trademark application and risking disclosure to potential squatters.

Our objectives in this paper are, first, to provide comprehensive evidence on the increasingly popular phenomenon of *submarine trademarks* in the U.S. and, then, to investigate factors driving the use of this filing strategy and its effectiveness in avoiding the disclosure of product information. We identify submarine trademarks as those in U.S. applications that claim priority to a prior filing in a *submarine jurisdiction* and remain undisclosed until the USPTO filing. We identify eight submarine jurisdictions as those that do not publish applications online for most of the time period considered: Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Swaziland, Tonga, and Trinidad and Tobago.¹⁴ We find that this strategy is pursued by a small but growing number of mostly tech companies, including some of the best known players such as Apple, Amazon, Cisco, Google, Intel, and IBM. Traditional consumer product companies, such as Mattel, also use submarine trademark filings, though less intensively.

To explore the factors driving the effectiveness and adoption of this strategy, we analyze the characteristics of the trademarks and information disclosed in submarine filings compared to other applications filed by the same applicants. We exploit heterogeneity in trademark filing types to distinguish between initial submarine filings in which both product name and description are concealed and subsequent submarine filings for previously disclosed trademarks. The latter presumably intended to preserve secrecy of the new product or services.

Our analysis using Google online search data suggests that the submarine filing strategy is successful in keeping product names secret until the company decides to reveal them to the public. Consistent with our theoretical framework that compares costs and benefits of each filing alternative, our results indicate that firms are more likely to pursue submarine trademarks when the protected products or services have greater economic value. Indeed, we find that applicants are more likely to use submarine trademarks when extending the U.S. application to obtain protection abroad via the Madrid Protocol. This is likely to reflect an expected global market for the protected product or service as well as risk posed by trademark squatters. Second, our results suggest that companies are more likely to rely on the submarine filing strategy

¹⁴There are other submarine jurisdictions, but they account for only a tiny share of all submarine trademarks. We therefore omit them from our analysis.

for products and services that are presented to the public for the first time, and for which prominent product launches may provide a ‘marketing thunder.’ Third, we also find submarine trademarks are chosen when applicants are more likely to encounter higher opposition rates prior to filing, suggesting that mitigating congestion or the risk of hold-up from third-party opposition may be a strong motivating factor. Finally, submarine trademarks are more likely when the product space displays higher rivalry, consistent with the prediction of our model that firms delay public disclosure especially when they face high risk of imitation by close competitors.

The concept of a submarine IP right is not new. Similar behavior had been observed in the U.S. patent system. Until November 2000, it was possible in the U.S. to keep patent filings secret until a patent issued. This allowed applicants to file so-called submarine patents – pending patents that were kept secret often for many years before they eventually issued and were disclosed to the public.¹⁵ Submarine patents are considered as an opportunistic (ab)use of the patent system since their main purpose is to obtain licensing payments from unsuspecting companies that were unaware of the patent. Such opportunistic behavior does not appear to motivate submarine trademark filings.

Our paper makes both a theoretical and an empirical contribution. From a theoretical standpoint, we are the first to characterize the phenomenon of submarine trademarks and develop a framework that considers both the costs and the benefits of different filing strategies. While the role of brands as firms’ most crucial assets has been widely studied in the marketing literature (see Bronnenberg and Dube, 2017), brand protection through legal means is a relatively under-explored phenomenon. We show how the trade-off between legal protection and information disclosure affects firms’ brand protection strategies.

Empirically, we identify submarine trademarks, study their characteristics and analyze the factors that explain under what circumstances firms are more likely to strategically delay the publication of their trademark applications and thus the disclosure of information about new products or services. As such, we provide empirical evidence on the trade-off created by public disclosure of new marks through online publication and the legal protection afforded through registration. In this way, we also contribute to the literature that examines the combination of different knowledge appropriation mechanisms by firms, in particular formal and informal IP protection (Hall et al., 2014).

The remainder of the article is organized as follows. Section 2 offers a theoretical framework to explain firms’ motivations to combine trademark registration and

¹⁵Often such submarine patents were modified over time through continuations, which increased the potential for hold-up because the patents only issued once a sufficiently large number of firms used some version of the technology successfully in the product market.

secrecy through submarine filings. Section 3 explains the application and registration of trademarks in the United States. Section 4 explains the data sources of our empirical analysis and Section 5 presents the empirical analysis and results. Section 6 offers a few concluding remarks.

2 Theoretical framework

In this section, we present a stylized framework of a firm's decision to use a submarine trademark filing strategy.

Consider a firm i in a market segment populated by n ex-ante identical firms. At time $t = -1$ firm i obtains an idea for a new product. To focus on the firm's decision with respect to trademark protection, we simply assume that the idea generation process is exogenous. Because the firm requires time to develop the idea into a product, the product launch occurs at time $t = 0$. At $t = 1$, all existing firms are able to imitate the new product at zero cost, driving profits to $\pi(n)$. As these profits are independent of the filing strategy of the firm, we can ignore them from the rest of analysis.

Firm i has the following choices:

1. File a U.S. trademark application directly with the USPTO at time $t = -1$ where it will be disclosed at $t = -1$;¹⁶
2. Keep the product and associated trademark secret and file the U.S. trademark application when the product launches at time $t = 0$;
3. File a submarine trademark application in a foreign jurisdiction (e.g. Trinidad and Tobago) at $t = -1$ and file the U.S. trademark application at time $t = 0$ claiming the foreign priority.

We shall discuss each of these decisions in turn.

If firm i files for a U.S. trademark at time $t = -1$, we assume that $s - 1$ potential rivals become aware of firm i 's plans and can launch competing products at time $t = 0$, where $s = f(n) < n$ with $f' > 0$ and $f'' < 0$. In words, not all existing rivals are able to develop a competing product at time $t = 0$ because, for instance, some firms lack product development and marketing capabilities. However, the larger the number of rivals, the larger the number of potential imitators of firm i 's product. All firms that launch a product at time $t = 0$ enjoy a temporary first-mover advantage and their profits are equal to $\pi(s) > 0$.

¹⁶For simplicity we assume that the filing and disclosure of a trademark application coincide at the USPTO since online publication occurs within days of filing. However, this assumption is not critical.

Thus, the profit of firm i if it files directly to register a trademark in the U.S. at $t = -1$ is:

$$\Pi^T = \pi(s) \quad (2.1)$$

Consider now the case in which firm i does not file a U.S. trademark application until time $t = 0$. In this case, we assume that information about firm i 's product development plans is not revealed to the market, so no rival will be able to launch a competing product at time $t = 0$. However, there is a probability β that firm i cannot register its trademark at time $t = 0$ because another firm has applied to register it for a similar mark in the meantime. β thus captures the degree of congestion and competitiveness in the trademark landscape. For instance, the USPTO may determine firm i 's trademark is confusingly similar to a trademark in an application filed by a competitor prior to $t = 0$. Consequently, the USPTO would reject firm i 's trademark application at $t = 0$, and firm i may expose itself to trademark infringement due to (potential) consumer confusion if it launches the product under the original mark. In this case, we assume that firm i needs to acquire the desired trademark, and the acquisition price is the outcome of a Nash bargaining equilibrium, where the bargaining power of firm i is parameterized by γ with $\gamma \in [0, 1]$.¹⁷ Thus, the profit of firm i if it does not file a U.S. trademark application directly with the USPTO at $t = -1$ is:

$$\begin{aligned} \Pi^{NT} &= (1 - \beta)\pi(1) + \beta\gamma\pi(1) \\ &= [1 - (1 - \gamma)\beta]\pi(1) \\ &= d(\beta)\pi(1) \end{aligned} \quad (2.2)$$

where $d(\beta)$ is decreasing in β .

Finally, consider the case in which firm i files a submarine trademark application. We assume that filing in a foreign submarine jurisdiction generates some additional fixed cost C . This cost is higher if the firm applies under a shell company to further disguise its ownership of the trademark. The filing of the submarine trademarks occurs at time $t = -1$, while the filing at the USPTO occurs at time $t = 0$. Thus, submarine trademarks only surface at time $t = 0$, and there is no risk of information spillovers to rivals until that time.¹⁸

¹⁷We assume that if firm i does not have access to the desired trademark, it will not be able to gain first mover advantage. Hence, its outside option in the negotiations is zero. Alternatively, one could assume that firm i can file alternative trademarks but this would reduce first mover advantage by some fraction. In turn, firm i will be able to negotiate a better price for the desired trademarks, improving the attractiveness of this strategy.

¹⁸This is a simplification. In reality, the submarine strategy might not always work. For instance, a

Profits of firm i if it files a submarine trademark application are:

$$\Pi^{ST} = \pi(1) - C \quad (2.3)$$

Next, assume that firms set quantities and that the demand function is given by

$$p(Q) = a - Q \quad (2.4)$$

where $Q = \sum_{i=1}^n q_i$ is the sum of outputs and a represents customers' willingness to pay for the product. For simplicity, we assume that firms produce at zero constant marginal costs and there are no fixed cost involved in production. Some straightforward calculations show that

$$\pi(1) = a^2/4 = \pi(a) \quad (2.5)$$

and

$$\pi(s) = g(s)\pi(a) \quad (2.6)$$

where $\pi(a)$ is increasing in a and $g(s) = 1/(1+s)^2$, thus decreasing in s .

Finally, we assume that there is a zero mean, random component in the profits from filing a submarine trademark application, ϵ . In this setup, there will be a submarine trademark filing, if

$$\Pi^{ST} + \epsilon \geq \max[\Pi^T, \Pi^{NT}] \quad (2.7)$$

which occurs with probability

$$\begin{aligned} \Omega &= Pr\{\epsilon \geq \max[\Pi^T, \Pi^{NT}] - \Pi^{ST}\} \\ &= Pr\{\epsilon \geq C - \pi(a)(1 - \max[g(s), d(\beta)])\} \end{aligned} \quad (2.8)$$

It is easy to see that $\partial\Omega/\partial a > 0$, $\partial\Omega/\partial s \geq 0$, and $\partial\Omega/\partial\beta \geq 0$.

From this analysis, we can derive the following empirical predictions:

Empirical Prediction 1. The probability of observing a submarine trademark instead of a regular trademark filing increases with the market value of the protected product.

submarine trademark might still be discovered or leaked and allow competitors to learn about firm i 's new product.

Empirical Prediction 2. The probability of observing a submarine trademark instead of a regular trademark filing increases with the number of potential rivals in the relevant product space.

Empirical Prediction 3. The probability of observing a submarine trademark instead of a regular trademark filing increases with the risk of trademark congestion or disputes in the relevant trademark space.

Our theoretical framework above has focused on one type of cost associated with securing brand protection through timely trademark filing: the risk of disclosing a firm's product development plan. Another potential cost is the lack of coordination of marketing activities at the time a product launches. The literature on new product development has stressed the importance of different marketing tactics firms can implement to boost the success of their product launches (Guiltinan, 1999). Indeed, the launch phase of a new product can trigger an emotional response from customers which affects subsequent behavior, such as purchase decisions, adoption, and recommendations to other potential consumers (Rindova and Petkova, 2007). If an early trademark filing reveals a product's characteristics and brand name before the official product launch, the coordination between marketing campaign and product launch might suffer and emotional responses (excitement!) might be muted. A good example of such tight coordination between product development, marketing and corporate communication is the launch of the *iPad* in 2010.¹⁹

To account for this 'marketing thunder' effect in our theoretical framework, one can simply assume that if the trademark is registered at $t = -1$ and the product is launched at $t = 0$, the profit of firm i is multiplied by a factor θ with $\theta \in (0, 1)$, where a larger value implies greater importance of coordination between marketing activities and product launch.

Using our framework above, the probability of a submarine trademark filing becomes:

$$\Omega = Pr\{\epsilon \geq C - \pi(a)(1 - \max[\theta g(s), d(\beta)])\} \quad (2.9)$$

with $\partial\Omega/\partial\theta \leq 0$.

Thus, we can derive the following additional empirical prediction:

Empirical Prediction 4. The probability of observing a submarine trademark instead of a regular trademark filing increases with the importance of coordinating the timing between marketing activities and product launch.

¹⁹Consumer excitement around the *iPad* has been document in various news reports e.g. <http://www.cnn.com/2010/TECH/ptech/04/03/apple.ipad.sale/index.html>.

3 U.S. trademark system

For the purpose of our analysis, two main aspects of the trademark system are particularly germane. First, how companies obtain legal protection for their marks and when trademark applications are disclosed to the public. Second, how companies can rely on prior filings abroad to acquire legal protection while maintaining the trademark and product or service it protects secret.

3.1 Trademark registration

Although trademarks are registered IP rights, U.S. common law provides for trademark protection of unregistered marks. Generally, a firm may establish common law trademark rights by actively using a distinctive mark in commerce.²⁰

In the U.S. system, use of a trademark establishes the right to legal protection (in other jurisdictions registration establishes the legal right). Therefore, U.S. trademark registration is not sufficient for protection if the trademark is not used or there is no intention of use within a defined period of time. That said, there are important advantages to federal registration over relying on a common law right. Arguably the most important advantage is the nation-wide priority right granted by registration. This makes it more difficult for competitors to subsequently register similar trademarks for the same or related goods and services and, therefore, results in exclusivity. Registration also grants a nationwide exclusive ownership right regardless of the actual geographical scope of use within the United States. Common law trademark rights are limited to the geographic area in which they are used. Moreover, after the 5th year from the registration date, a declaration of incontestability can be obtained which limits the grounds on which the trademark may be invalidated for the rest of its (in principle infinite) lifetime. Registration creates a strong presumption of validity in any cancellation proceedings. Federally registered trademarks can be enforced in federal courts, and owners can record the registered trademark with the U.S. Customs and Border Protection Service to have infringing imported goods seized at the border.

To register a trademark in the United States, an individual or firm files a trademark application with the USPTO. Once submitted, the application becomes part of the public record and is viewable in the USPTO's online trademark database generally within a few days of the filing date.²¹ The Office checks the trademark application

²⁰Per common law, a trademark owner has the exclusive right to prevent unauthorized third parties from using the same or similar mark on goods and services where such use would likely cause confusion among consumers regarding source.

²¹The USPTO is required by law to maintain records of trademark applications and registrations and to make them available for public inspection. See 37 C.F.R. 2.27.

on formal grounds and, if all requirements are met, it moves on to the substantive examination stage. Examiners decide whether the application meets registration requirements, which largely entails verifying that the trademark is sufficiently distinctive (not merely descriptive) and not confusingly similar to existing trademark registrations for the designated set of goods and services. This means that applicants that file first are at an advantage provided they have a legal basis for filing the application (see Section 3.2 below), which creates incentives for filing a trademark application as early as possible. Once the examiner determines that a trademark can be registered, it is published in the USPTO Trademark Official Gazette. This is a distinct publication that marks the beginning of a 30-day opposition period, during which third parties have the option to oppose registration of an allowed application on various legal grounds. If no opposition is filed, or the opposition is not successful, and the applicant has established commercial use, the trademark is registered.

An individual trademark may span multiple registrations, each with a different designated set of goods and services. The goods and services ‘identification’ (G/S ID) defines the scope of trademark protection covered by an individual registration. G/S IDs can be reduced but not expanded in scope after registration. Thus, when a firm wants to extend an established brand name to a novel product category, it must file a new application for the same trademark but a new G/S ID. Such subsequent filings to extend the trademark to new goods and services are not explicitly labeled in the trademark data. However, we can identify likely multiple filings for a specified trademark based on such data elements as the applicant, characters of the word mark, mark drawing form, and mark description.

3.2 Foreign priority

Applicants have to claim a legal basis to file for a trademark registration in the United States. An applicant has different options to assert a legal basis for filing (Lanham Act):

- 1) Use in U.S. commerce (Section 1a);
- 2) Bona fide intent to use in U.S. commerce (Section 1b);
- 3) Priority claim based on a foreign application filed within six months of the U.S. application (Section 44d);
- 4) Foreign registration (Section 44e);
- 5) Extension of an international registration via the Madrid system (Section 66a).

Options 1), 4), and 5) provide sufficient legal basis for registration whereas 2) and 3) only provide the legal basis for filing an application. In order to register a trademark under 2), applicants have to submit proof of use prior to registration. To register a trademark claiming priority of a foreign filing under 3), the foreign jurisdiction has to approve and register the trademark. Moreover, for both 3) and 4), the country of origin of the applicant as well as the jurisdiction of the priority claim have to be signatory to the Paris Convention.²²

The main purpose of Section 44d and 44e of the Lanham Act of 1946 (Trademark Act) is to allow foreign applicants to obtain trademark protection in the United States while preserving the priority date of their first foreign filing. Federal regulation explicitly rules out the United States as an applicant's country of origin if the applicant seeks to file a trademark application with the USPTO under Section 44d and register it under Section 44e. This means that Apple cannot rely on the priority acquired in Trinidad and Tobago for the *Apple Watch* trademark unless it claimed its country of origin to be Trinidad and Tobago.²³ However, U.S., as well as foreign, applicants can circumvent this restriction by asserting Section 44d in combination with Section 1a or 1b. That is, an applicant can file at the USPTO under Section 44d, claiming priority to the foreign application, but then, prior to U.S. registration, amend the legal basis to use under Section 1a or, more likely, intent to use under Section 1b.²⁴ Fully permissible under U.S. trademark law, this practice allows firms to adopt submarine trademarks by filing in foreign jurisdictions that do not publish applications and, thereby, secure an exclusive trademark right six months before revealing the mark and the product or services it protects to the market.

4 Data

We rely primarily on the USPTO Trademark Case Files Dataset which provides information on all trademark filings with the USPTO between 1970 and 2016 (Graham et al., 2013). We focus our analysis on the period 2002 onward.²⁵ The data provide detailed information on trademark filings with the USPTO, including information on foreign applications used to assert a legal basis for the U.S. filing. The data also contain infor-

²²TMEP Section 1002.02.

²³To have a valid basis for registration, the applicant must have a bona fide and effective industrial or commercial establishment in the foreign country. See 15 U.S.C. 1126(c), TMEP 1002.04.

²⁴The applicant can retain the Section 44d priority filing date and request the mark be approved for publication for opposition based solely on the Section 1b basis. See TMEP 806.02(f), 806.04(b), 1003.04(b). This requires the applicant to declare a bona fide intent to use the trademark in U.S. commerce and submit acceptable proof of use before registration.

²⁵Because of the way the data were recorded by the USPTO, the most recent data are the most complete.

mation on trademark owning entities and the goods or services for which trademark protection is sought.

We filtered submarine trademarks from the entire set of trademark applications by first selecting all applications with a foreign application in a country for which prior research suggested that trademark applications may not be published within six months of filing.²⁶ We then omitted applications with foreign applications in multiple jurisdictions²⁷ and those for which the applicant's nationality is in the submarine jurisdiction.²⁸ We also required these filings to use the foreign application as a legal basis for the filing with the USPTO or claim priority to a foreign application when filing under a different basis (see Section 3.2 above). Manual inspection of the results quickly pointed to the countries frequently used for submarine strategies, namely Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Swaziland, Tonga, and Trinidad and Tobago. Finally, using data on reassignments, the prosecuting attorney and the trademarks themselves, we were able to identify the shell companies that brand owners used as a second layer of disguise.²⁹ However, it is important to note that we only identified the shell companies that applied for trademarks in the submarine countries; brand owners may well have used additional shell companies outside those countries.

To assess firms' motivation for utilizing submarine trademarks, we constructed a comparison set of non-submarine trademark applications filed by the same applicants. To do so, we compiled a master list of 187 unique submarine trademark owning firm names, including those of both brand owners and shell companies. We then matched this master list to the 2.9 million unique names of all trademark owners on non-submarine applications. We completed a series of pre-processing steps to remove special characters and standardize common terms in both submarine and non-submarine trademark owner names. We then conducted an iterative process of fuzzy matching and manual inspection to refine matches and minimize error.³⁰ Given that our master

²⁶We initially extracted all trademarks filed in any jurisdiction that did not have a searchable online trademark register in the 2002-2016 period, does not publish applications within six months of filing, or for which a [blog](#) suggested submarine trademark applications were filed. In addition to the eight countries used for our analysis, the original list included United Arab Emirates, Barbados, Bolivia, Costa Rica, Ecuador, Guatemala, Namibia, Nigeria, Nicaragua, Panama, Peru, Saudi Arabia, El Salvador, Uganda, and Venezuela. After manual inspection, we omitted these countries because they account for a tiny share of all submarine trademarks. Many had no submarine trademarks after restrictions related to multiple foreign applications and applicant nationality were applied.

²⁷Prior foreign applications in multiple countries is inconsistent with the submarine strategy as public disclosure is more likely.

²⁸Manual inspection confirmed that these applications were filed by foreign entities in their domestic jurisdiction.

²⁹We conducted extensive Internet searching to confirm shell companies and/or the applied for trademarks were controlled by brand owners.

³⁰We included both original applicants and subsequent owners of non-submarine filings in the match in an effort to account for additional shell companies used outside the submarine countries. We manually

list of submarine trademark owning firm names is relatively small, we are reasonably confident in the precision of our match. We construct a base comparison set to include only those matching non-submarine applications that were filed three years prior to the owning firm’s earliest submarine trademark filing or thereafter through 2016. For the submarine and non-submarine comparison group, we construct trademark application- and class-level variables from the USPTO Trademark Case Files Dataset (defined in Table 2).

We complement our analysis of submarine trademarks with online search data extracted from Google Trends. The data was obtained by accessing the public Google API.³¹ These data are used to measure public awareness of new marks relative to the official announcement/release date of the corresponding products and services. For this analysis we collected product announcement and release dates for the products and services associated with submarine and non-submarine trademarks. These data were collected manually through web searches. We did this for all submarine trademarks and a subset of non-submarine trademarks due to the labor-intensive nature of the data collection.³²

5 Empirical analysis

5.1 Descriptives

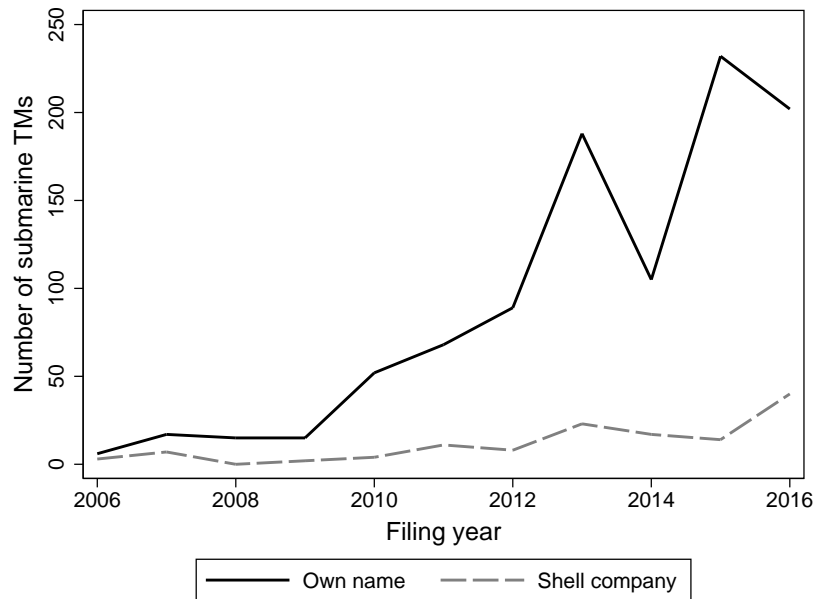
We begin with a descriptive analysis of the submarine trademark phenomenon. Figure 1 shows the total number of submarine trademark applications filed with the USPTO by filing year. The figure distinguishes between applications for submarine trademarks filed by companies in their own name and those that were filed by a shell company. It is evident from Figure 1 that submarine trademark filings are rare. We identify 1,136 submarine trademark filings for the 2006-2016 period, representing less than 0.03% of total applications filed during that time. Still, Figure 1 shows submarine filings increasing four-fold since 2006 (for a breakdown by submarine jurisdiction see Appendix Figure A-1). The number of companies filing to register a submarine trademark has similarly climbed (see Appendix Figure A-2).

inspected any non-applicant matches to submarine master list to ensure applications were transferred between related entities rather than reassignments between unrelated parties. Through this process, we identified a handful of additional shell companies used by brand owners on applications filed with the USPTO.

³¹We used the [gtrendsR](#) package in R.

³²For non-submarine trademarks, we collected product announcement/release dates for all non-submarine trademarks filed by a random subset of companies including Activision Publishing inc, Aegis Trademarks by, Airbnb inc, Amazon Technologies inc, Apple inc., and Zynga inc. They account for 7.6% of all non-submarine trademark filings (11% if we exclude Mattel inc).

Figure 1: Submarine filings



This figure shows the total number of trademark filings with the USPTO between 2006-2016 by a given applicant that claims priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Swaziland, Tonga, or Trinidad and Tobago. Companies file trademarks either using their *own name* (e.g. *Amazon inc.*) or the name of a *shell company* (e.g. *Kelpach llc*) and later reassign the trademark to the actual owner (e.g. from *Kelpach llc* to *Amazon inc.*).

Table 1 shows the top-15 users of the submarine trademark strategy. The table indicates all submarine trademark applications filed by the company and separately lists those filed by shell companies instead of the actual brand owners. It also indicates each firm's submarine trademark intensity as measured by the number of submarine filings over all trademark filings by a given company. Apple has by far the largest number of submarine trademarks. It also files the largest number of trademarks in the name of different shell companies (we identify a total of 17 different shell companies for Apple). Apple relies on the submarine strategy for over half its total trademark filings, second only to Bethesda Softworks in terms of submarine intensity. Mattel is the only 'traditional' manufacturer in the top-15 list but pursues the submarine strategy for a minor share of its total trademark filings. The other companies are largely in the tech sector and include household names such as Google, Amazon, Intel, and Facebook. They also include online game developer Zynga as well as telecom operator T-Mobile.

Figure 2 depicts the distribution of trademark applications across the 45 Nice classes for submarine compared to non-submarine filings for all users of the submarine trademark strategy. It shows submarine filings are concentrated in class 9 (Electronic and scientific apparatus) with sizable shares in services classes, particularly 41 (Education and entertainment) and 42 (Computer and scientific). Non-submarine filings are also concentrated in class 9, though to a lesser extent, and in class 28 (Toys and sporting

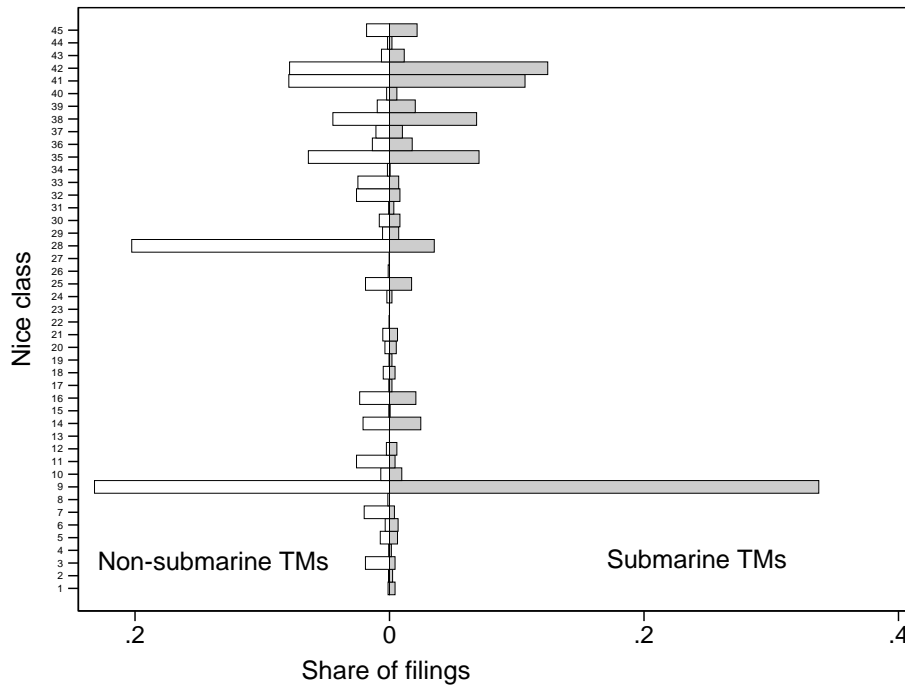
Table 1: Top-15 companies filing submarine TMs

Rank	Company	Submarine TMs		
		% Share	# All	# Shell comp.
1	Apple inc	56.05	412	48
2	Google inc	16.91	92	9
3	Zynga inc	25.73	70	0
4	Mattel inc	1.64	70	0
5	T-Mobile inc	8.63	43	18
6	Cisco Tech inc	12.04	40	0
7	Amazon Tech inc	10.28	40	34
8	LG Electronics inc	2.32	37	0
9	Bethesda Softworks llc	88.46	23	0
10	Intel Corp	24.21	23	0
11	Beats Electronics llc	41.17	21	0
12	facebook inc	12.78	17	1
13	Instragram llc	20.51	16	0
14	Nest Labs inc	32.65	16	0
15	Tivo Brands llc	23.80	15	0

Notes: The table shows the total number of trademark filings with the USPTO between 2002-2016 by a given applicant that claims priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Swaziland, Tonga, or Trinidad and Tobago. % Share computed as the number of submarine filings over all trademark filings by a given company.

goods) which reflects the inclusion of Mattel in the sample of submarine strategy users.

Figure 2: Nice class distribution



This figure shows the distribution of trademark filings over Nice classes. Submarine trademarks are defined as filings with the USPTO by a given applicant that claims priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Tonga, or Trinidad and Tobago. Non-submarine trademarks are filings by a given applicant that are filed directly with the USPTO. Nice classes: Class 1: Chemicals; Class 2: Paints, varnishes, lacquers; Class 3: Cosmetics and cleaning preparations; Class 4: Lubricants and fuels; Class 5: Pharmaceuticals; Class 6: Metal goods; Class 7: Machinery; Class 8: Hand tools; Class 9: Electrical and scientific apparatus; Class 10: Medical Apparatus; Class 11: Environmental control apparatus; Class 12: Vehicles; Class 13: Firearms; Class 14: Jewelry, precious metals; Class 15: Musical Instruments; Class 16: Paper goods and printed matter; Class 17: Rubber goods; Class 18: Leather goods; Class 19: Nonmetallic building materials; Class 20: Furniture and articles not otherwise classified; Class 21: Housewares and glass; Class 22: Cordage and fibers; Class 23: Yarns and threads; Class 24: Fabrics; Class 25: Clothing; Class 26: Lace and embroidery; Class 27: Floor coverings; Class 28: Toys and sporting goods; Class 29: Meats and processed foods; Class 30: Staple foods; Class 31: Natural agricultural products; Class 32: Light beverages; Class 33: Wine and spirits; Class 34: Tobacco; Class 35: Advertising and business; Class 36: Insurance and financial; Class 37: Building construction and repair; Class 38: Telecommunications; Class 39: Transportation and storage; Class 40: Treatment of materials; Class 41: Education and entertainment; Class 42: Computer, scientific, legal; Class 43: Hotels and Restaurants; Class 44: Medical, beauty, agricultural; Class 45: Personal and social services.

5.2 Trademark filing types

So far we have distinguished only between submarine and non-submarine trademark applications. However, empirically, this distinction does not fully reflect the observed trademarking behavior of the companies in our dataset due to the fact that sometimes firms file multiple applications for the same mark. The data reveal four types of trademark filings:

1. **Submarine only [SUB]** filing or first submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark.

2. **Non-submarine only [NSUB]** filing or first non-submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark.
3. **Submarine filing [N/SUB-SUB]** for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark.
4. **Non-submarine filing [N/SUB-NSUB]** for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark.

We take these different filing types into account in our empirical analysis since they have different implications for the submarine filing strategy. For an initial filing, the submarine strategy may succeed in keeping both the mark (e.g. *iPhone*) and the goods and services (G/S ID) description (e.g. *handheld mobile digital electronic devices for the sending and receiving of telephone calls*) secret. For a subsequent filing for a brand extension, the mark is already disclosed to the market. Thus, a submarine filing primarily serves to conceal the G/S ID, which may contain detailed information regarding novel products or new market entry. This implies that the SUB type is used to achieve secrecy of the mark as well as the G/S ID, whereas the N/SUB-SUB type is used only to keep the G/S ID secret. In contrast, both the NSUB and N/SUB-NSUB categories result in full disclosure of a mark and its G/S ID.

5.3 The effect of submarine filings

We first analyze the effectiveness of the submarine filing strategy in maintaining product names secret using Google Trends data for the United States. Google Trends offers aggregate Google search data in the form of an index that captures relative search intensity for a specific search term or combination of several terms since January 2005.³³ The data allow us to measure to what degree people searched for specific submarine and non-submarine marks online over time.³⁴ We extracted data on searches at daily intervals relative to the announcement date (which may coincide with the release date) of the products and services protected by the trademarks in our sample.

We assume that the official product announcement date marks when the company decided to reveal the name to the public. If a company keeps the name secret before the announcement, we should not observe any significant amount of Google searches

³³Google Trends data have been used to measure awareness in many other contexts (for an overview see Gentzkow et al., 2017).

³⁴We assessed the reliability of search data for each mark in our sample. We dropped those marks where we could not be sure that the Google Trends data identified searches for the mark (e.g. Amazon's brand *Mama Bear*). We also identified those marks for which different search terms were needed to extract accurate Google Trends data, for example by combining a mark with the company's name (e.g. "*amazon fire*" instead of *fire*), or by using exact search terms (e.g. "*kindle fire*" instead of *kindle fire*).

prior to that date.³⁵ Instead, if the name has leaked or been revealed earlier, it would show up in the pre-announcement Google search data. Provided that submarine filings keep the trademark application secret until it is filed at the USPTO, we expect that submarine marks will be associated with fewer Google searches before the official product announcement date. We can therefore compare Google searches over time for submarine vs. non-submarine filings to assess whether marks protected by a submarine filing strategy are more likely to be successfully concealed until the company makes its official announcement.

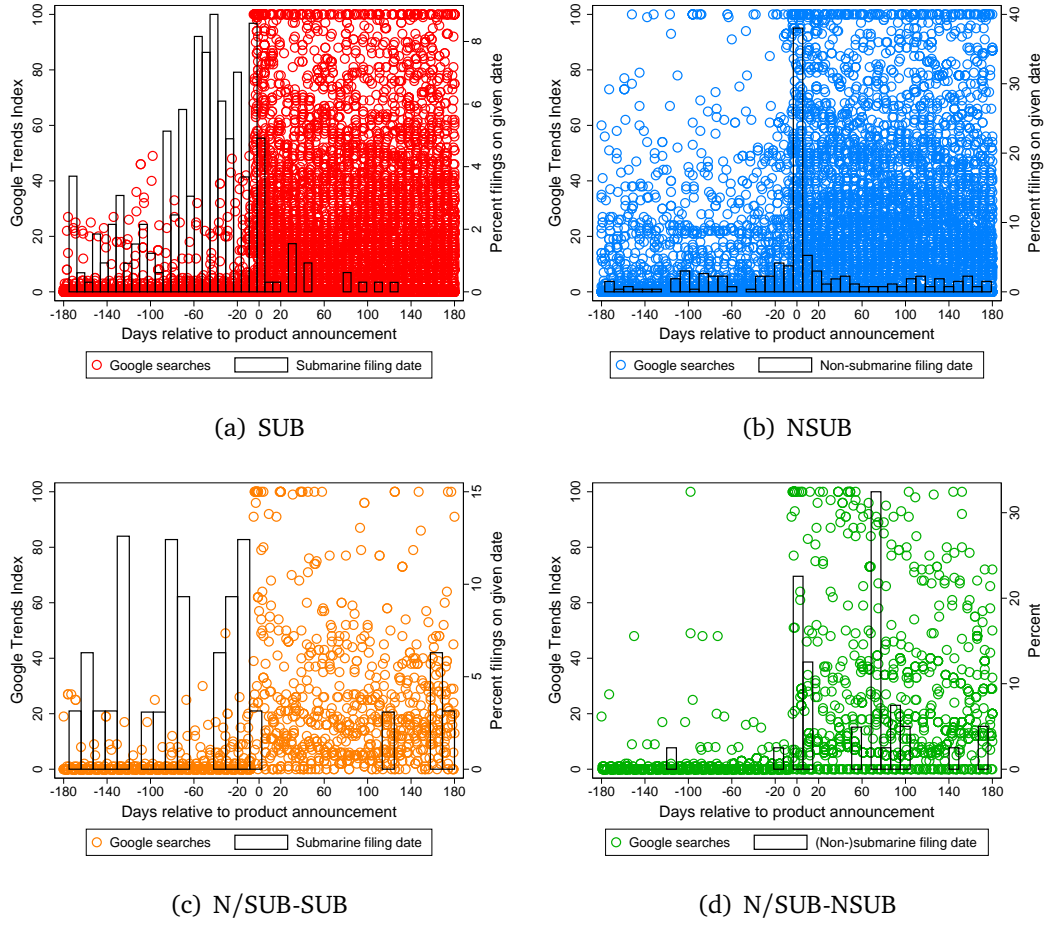
Figure 3 depicts Google search data for the four types of submarine and non-submarine trademarks discussed in Section 5.2 above. Each graph shows the filing dates (bars indicate foreign filing date for submarine trademarks and U.S. filing date for non-submarine trademarks) and Google search index values (nodes) relative to the official product/service announcement date for each trademark in the category. The top-left quadrant suggests that, in most cases, the submarine strategy is effective at maintaining secrecy pre-launch. There are very few Google searches for submarine trademarks (SUB) before the corresponding products/services are publicly announced. While a few searches show up before the product was announced, it is difficult to assess whether the submarine strategy, in fact, failed because most submarine trademarks with pre-announcement searches protect less distinctive words like *MOBILE ME* or *EXPRESS LANE*, or were known to the public but not in the form to which protection was sought, such as in the case of the *RIO 2016* official logo.

The top-right quadrant of Figure 3 shows Google searches for non-submarine filings (NSUB). The bulk of searches occur after the product announcement date which, for the majority of trademarks, coincides with the application filing date. That said, the figure does indicate higher search volumes pre-announcement, suggesting there was more pre-launch public disclosure than in the case of submarine trademarks. The figure also shows that the large majority of non-submarine trademark applications are filed on or very close to the official product announcement date. This is consistent with our theoretical model (Section 2) in which firms that do not opt for a submarine strategy tend to file trademark applications when the product launches at $t = 0$, rather than risk disclosure by filing pre-launch (at $t = -1$).

The lower quadrants of Figure 3 depicts Google searches and filing dates for applications with the same trademark as a previously filed (submarine or non-submarine) application. For the N/SUB-SUB category, we see that the majority of submarine applications – that are filed after the mark had already surfaced at the USPTO due to

³⁵Some searches may still appear in the data, but those are mostly noise due to specific words included in a mark that are used in other contexts (e.g. Apple's *OS X Mountain Lion*).

Figure 3: Google Trends searches: submarine vs non-submarine trademarks by trade-mark filing type



This figure shows Google Trends searches for the products associated with 326 SUB, 266 NSUB, 32 N/SUB-SUB, and 29 N/SUB-NSUB trademarks 180 days before and after the official product announcement. Submarine trademarks are defined as filings with the USPTO by a given applicant that claim priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Tonga, or Trinidad and Tobago. Non-submarine trademarks are filings by a given applicant that are filed directly with the USPTO. SUB: submarine only filing or first submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; NSUB: non-submarine only filing or first non-submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; N/SUB-SUB: submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark; N/SUB-NSUB: non-submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark.

the disclosure of an earlier trademark on the same mark – are still filed before the product announcement. Moreover, we see that, despite the public disclosure of the preceding mark, there are relatively few searches before the product was announced. In the N/SUB-NSUB case, the bars indicate that the vast majority of these subsequent non-submarine applications were filed at or after the product announcement. There are also few Google searches prior to product announcement which may reflect that, for a subset of this category, the first filing was a submarine.

Table 2 compares average Google searches 180 days before and after the product announcement for submarine and non-submarine trademark filings. We see that for both submarine (SUB) and non-submarine (NSUB) categories, average searches increase very substantially after the product announcement as seen in Figure 3. However, there are fewer pre-announcement searches for submarine trademarks and, hence, the difference in searches after the public announcement is larger. We observe a similar pattern when comparing subsequent submarine (N/SUB-SUB) versus non-submarine (N/SUB-NSUB) applications.

Table 2: Google Trends descriptive statistics

	Before Product Announcement			After			diff	
	n	mean	sd	n	mean	sd	mean	
SUB	6,200	0.555	3.267	6,604	23.611	26.820	23.055	***
NSUB	5,275	3.342	11.516	5,660	23.199	27.854	19.857	***
N/SUB-SUB	400	1.692	4.988	429	25.794	24.667	24.102	***
N/SUB-NSUB	222	2.157	6.950	216	20.333	27.748	18.175	***

Notes: The table shows Google Trends searches for submarine and non-submarine trademark filings. Submarine trademarks (SUB and N/SUB-SUB) are defined as filings with the USPTO by a given applicant that claim priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Tonga, or Trinidad and Tobago. Non-submarine trademarks (NSUB and SUB-NSUB) are filings by a given applicant that are filed directly with the USPTO. SUB: submarine only filing or first submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; NSUB: non-submarine only filing or first non-submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; N/SUB-SUB: submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark; N/SUB-NSUB: non-submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark. Note that we have data on Google searches for 266 of the total of 715 submarine trademarks and for a random sample of 176 non-submarine trademarks. *** $p < 0.01$.

Regression analysis further confirms the effectiveness of submarine filings in keeping trademarks secret prior to public launch. Table 3 shows the results of OLS regressions where the dependent variable is the Google Trends index and the regressors include dummy variables for the period before the product announcement and whether

a given trademark application is a submarine filing. The period covers 180 days pre- and post-announcement, and all specifications include dummy variables for the days relative to the product announcement.

Columns (1) and (2) of Table 3 show regression results for the subsample of submarine (SUB) and non-submarine (NSUB) filings. The specification in column (1) includes an interaction of pre-announcement and submarine dummy variables; whereas the specification in column (2) includes trademark fixed effects. Results shown in columns (1) indicate that the interaction effect is negative, and statistically significant at the 5% level. This suggests that submarine trademarks are associated with fewer searches, compared to non-submarine filings, before a product is publicly announced. The before product announcement dummy in column (1) also shows that there are fewer searches before product announcement. The submarine dummy in column (1) is not statistically significant indicating that there is no difference in searches between SUB and NSUB trademarks after the official product announcement. Columns (3) and (4) show results when we compare the SUB category with the subsequent filing categories - N/SUB-SUB and N/SUB-NSUB categories. Since in both cases, at least some product names have been protected by submarine filings, it is re-assuring that we do not see any effects on Google searches in either columns (3) or (4).

Overall, the analysis of the Google search data suggests that submarine filings succeed in keeping product names under the hood until they are publicly announced. Of course, other factors correlated with the use of the submarine filing strategy are likely to also contribute to a company's ability to maintain a given mark secret before it is officially revealed to the public (e.g. a company might exert more effort internally to maintain secrecy). That is, our analysis does not reveal a causal effect of submarine filings on secrecy. That said, our analysis does support the view that submarine trademarks are associated with increased secrecy relative to regular trademarks. We now shift to consider under what conditions firms select a submarine filing strategy.

5.4 Motivation for submarine filings

In this section, we test the empirical predictions posited by our theoretical model (in Section 2). Generally, our model predicts that firms are more likely to pursue a submarine trademark strategy when the product protected by the marks is more valuable, a product's 'marketing thunder' is important, there are more potential rivals in the product market, and there is higher risk of congestion or dispute in the trademark space. Trademark data do not directly measure these theoretical concepts. However, we can construct a set of trademark application- and class-level variables to proxy these different factors in order to investigate firms' motivations for pursuing a submarine trade-

Table 3: Google Trends searches: submarine vs. non-submarine TMs

	SUB v NSUB		SUB v N/SUB-SUB	SUB v N/SUB-NSUB
	(1)	(2)	(3)	(4)
Before product announcement (0/1)	-19.784*** (3.272)	-31.982* (17.026)	-27.767*** (3.557)	-26.385*** (3.585)
Submarine TM (0/1)	0.693 (1.358)		2.542 (2.831)	3.429 (3.358)
Before × Submarine (0/1)	-3.090** (1.346)	-3.089** (1.344)	-1.418 (2.717)	5.165 (3.541)
Trademark	NO	YES	NO	NO
Day relative to product announcement	YES	YES	YES	YES
R2	0.280	0.229	0.346	0.341
Obs	23,739		13,273	12,880

Notes: The table shows the coefficients of an OLS regression. The dependent variable is the Google Trends Index associated with searches for a given trademark 180 days before and after the official product announcement. Submarine trademarks (SUB and N/SUB-SUB) are defined as filings with the USPTO by a given applicant that claim priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Tonga, or Trinidad and Tobago. Non-submarine trademarks (NSUB and SUB-NSUB) are filings by a given applicant that are filed directly with the USPTO. SUB: submarine only filing or first submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; NSUB: non-submarine only filing or first non-submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; N/SUB-SUB: submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark; N/SUB-NSUB: non-submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark. Robust standard errors are clustered at the trademark-level. * p<0.10, ** p<0.05, *** p<0.01.

mark filing empirically.

Table 4 presents descriptive statistics of trademark-based metrics for the different submarine and non-submarine trademark types explained in Section 5.2 above as well as the binary distinction between submarine (SUB and N/SUB-SUB) and non-submarine (NSUB and N/SUB-NSUB) trademarks. Because applications can cover multiple Nice classes, we report most of our analysis at the class level.

We consider a series of variables derived from the trademark application that indicate value, both of the trademark itself and the goods or services it is to protect. To capture the value of the trademark itself, we use two indicators. The first indicator (*Design only*) identifies marks that consist of only design elements, meaning they lack any letters or numbers.³⁶ Design only or *iconic* marks are relatively more valuable because they take less time for consumers to process and convey ideas more effectively than words. They can also span languages and cultures which may be critical for firms pursuing a global branding strategy. Accordingly, we anticipate firms are more likely to pursue the submarine strategy for design only marks. This hypothesis is also supported by the descriptive statistics in Table 4. Roughly 16% of submarine trademark applications are for design only marks, compared to only 0.5% of non-submarine trademark filings. The second indicator (*Disclaimer*) specifies when the applicant disclaims rights to an unregistrable component of an otherwise registrable trademark. This tends to occur when trademarks include a generic product name or merely descriptive term.³⁷ Trademarks with such components are of arguably lower value because they are less distinct. Thus, we expect disclaimers to be relatively less prevalent among submarine trademark applications, which Table 4 also supports.

To proxy the value of the product the trademark serves to protect, we construct several variables. First, we create an indicator variable that is equal to one if a trademark covers both product and service classes (*Product & Service*).³⁸ Trademarks that cover both products and services tend to apply to products that are broader and therefore often more valuable. For example, the *Google Chrome* submarine trademark is registered in goods class 9 (Electronic and scientific apparatus) as well as service classes 35 (retail store services) and 42 (Computer and scientific). The second variable counts the total number of Nice classes covered by the trademark (*Nice class count*). Here again the assumption is that more valuable products are covered by trademarks across more classes although this does not necessarily need to include both goods and services classes. Table 4 shows that trademarks in the SUB category have a larger share of trade-

³⁶We identify design only trademarks based on the mark drawing code.

³⁷Merely descriptive term, such as *DIET*, may be deemed unregistrable matter to which the applicant disclaims rights. See TMEP 1213.

³⁸The Nice classification has 45 classes where classes 1-34 cover goods and classes 35-45 services.

Table 4: Descriptive statistics

Variable	Submarine		Non-submarine		SUB		NSUB		N/SUB-SUB		N/SUB-NSUB	
	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
Trademark-level												
Design only (0/1)	0.159	0.366	0.048	0.214	0.174	0.379	0.048	0.215	0	0	0.028	0.168
Disclaimer (0/1)	0.121	0.327	0.184	0.388	0.123	0.329	0.186	0.389	0.101	0.302	0.017	0.131
Prior related mark (0/1)	0.288	0.453	0.250	0.433	0.275	0.447	0.249	0.432	0.414	0.495	0.335	0.473
Nice class count	1.855	2.066	1.471	1.314	1.794	1.667	1.463	1.298	2.484	4.397	2.046	2.126
Madrid filing (0/1)	0.456	0.498	0.075	0.263	0.449	0.497	0.072	0.259	0.525	0.501	0.260	0.439
Share Madrid filing in China	0.536	0.413	0.166	0.339	0.534	0.414	0.163	0.337	0.552	0.404	0.406	0.412
Product & Service (0/1)	0.264	0.441	0.126	0.331	0.261	0.439	0.124	0.330	0.303	0.461	0.242	0.430
Acquired distinctiveness (0/1)	0.022	0.147	0.007	0.087	0.016	0.128	0.007	0.083	0.080	0.273	0.052	0.222
Observations	13,761		1,118		1,019		13,588		99		173	
Trademark-class-level												
Prior opposition rate [†]	0.022	0.004	0.023	0.006	0.022	0.005	0.023	0.006	0.022	0.055	0.022	0.006
ln Length of G/S [‡]	5.937	1.232	5.193	1.515	5.917	1.212	5.183	1.514	6.082	1.368	5.764	1.422
2d rejection rate [¶]	0.148	0.022	0.143	0.023	0.148	0.022	0.143	0.022	0.143	0.022	0.147	0.025
Observations	20,243		2,075		1,829		19,889		246		354	

Notes: The table shows descriptive statistics for trademark filings with the USPTO between 2002-2016. Submarine trademarks are defined as filings with the USPTO by a given applicant that claim priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Tonga, or Trinidad and Tobago. Non-submarine trademarks are filings by a given applicant that are filed directly with the USPTO. SUB: submarine only filing or first submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; NSUB: non-submarine only filing or first non-submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; N/SUB-SUB: submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark; N/SUB-NSUB: non-submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark; † Computed at the class-level as 5-year moving average. ‡ G/S: goods and services list; ¶ 2d rejection due to likelihood of confusion computed at the class-level 1 year prior to filing date.

marks that cover both goods and services and a larger Nice class count compared to trademarks in the NSUB category. This also holds for subsequent filings (N/SUB-SUB vs. N/SUB-NSUB).

A third variable of product value is constructed directly from the goods and services identification (or “ID”) text in the application.³⁹ An applicant has to specify the particular goods and/or services on (or in connection with) it uses or intends to use the trademark. This owner-provided ID text must comply with various requirements regarding specificity, accuracy, and clarity.⁴⁰ Consequently, it is much more granular than the Nice classification and may disclose detailed information regarding the product markets an applicant is entering. Some applicants pursue strategies to avoid revealing particular goods and services of interest to competitors by embedding or disguising them within lengthy IDs.⁴¹ Since these strategies serve to preserve secrecy, we expect them to be more prevalent in submarine trademark applications. We use the log of the length of the ID text (*ln Length of G/S*) to proxy the use of such strategies and hence product value. As Table 4 indicates, IDs in submarine applications tend to be longer than those of regular applications, though the magnitude of the mean difference is less than one word.

To capture the importance of ‘marketing thunder’ associated with a brand name, we include an indicator for whether a mark has prior related marks and hence is likely to have been disclosed in some form. The prior related mark indicator (*Prior related mark*) designates when the application identifies some prior registrations of similar marks owned by the applicant (Graham et al., 2013). If coordinating the timing of when a new product is revealed to the public and associated marketing activities is important, we would expect the trademark to be less likely to have any related prior filings. Furthermore, we include an indicator for acquired distinctiveness (*Acquired distinctiveness*). This indicator identifies marks that normally would be too descriptive to be registrable as a trademark (e.g. *iCloud*) but the applicant claims that it should nevertheless be registered because customers have come to associate the mark with a specific product or services through exclusive use in commerce. As Table 4 shows, submarine trademarks applications, both initial and subsequent filings, are more likely to have acquired distinctiveness relative to the comparison group of regular applications.

To proxy the risk of congestion or dispute in the trademark space, we construct

³⁹The USPTO uses the ID text to assign an application to the appropriate Nice class(es). Generally, the applicant designates the Nice class(es) for the ID upon filing. If the applicant fails to identify a class or inputs an improper class, the USPTO examining attorney will correct the classification during examination (Graham et al., 2013).

⁴⁰See TMEP 1402.

⁴¹See <https://www.lexology.com/r.ashx?l=7ZPHBA4> for an example of trademark practitioners recommending such strategies.

two class-level metrics. The first measure captures congestion based on the within-Nice-class rate of rejections under Section 2d of the Trademark Act due to the applied for trademark being confusingly similar to a previously registered mark (*2d rejection rate*).⁴² Specifically, it is the proportion of class-level applications subject to a likelihood of confusion refusal filed the period prior to a given application filing in the same class.⁴³ Higher 2d rejection rates, across both classes and time, indicate a more congested trademark register as it is more difficult for applicants to secure unclaimed register name space for a select product. The second measure captures the risk of dispute based on the prior opposition rate (*Prior opposition rate*), which is calculated as the proportion of class-level published applications subject to a third-party proceeding in the period prior to a given application filing in that class.⁴⁴ The opposition rate indicates the extent to which third parties challenge applied for registrations in the class the applicant is filing. A high rate suggests more intense competition among firms for trademark register name and product space. Table 4 indicates that, overall, submarine trademark applications have a slightly higher 2d rejection rate and slightly lower prior opposition rate, on average, than regular non-submarine applications. This is not particularly surprising given that there is considerable variation in these rates across Nice classes and filing years such that pooled statistics are less informative.

Lastly, we investigate whether the applicant extends the U.S. application to obtain protection abroad via the Madrid Protocol (*Madrid filing*). This is more likely to occur with a valuable trademark and/or product, as part of a global marketing strategy. Through an early submarine filing followed by a Madrid application, a firm can mitigate the risk of trademark disputes resulting from accidental shoulder rubbing and squatting outside of the US. We therefore expect submarine trademark applications to be extended to Madrid at a much higher rate than regular applications. Within our sample, roughly 45% of submarine trademark (SUB) applications are extended to Madrid, compared to only 7% of regular (NSUB) applications (see Table 4). The geographic dispersion of applications via the Madrid system (Figure A-3 in the appendix) indicates that submarines outnumber regular applications among Madrid international filings in most countries, with a few exceptions.⁴⁵ To capture an applicant's perceived

⁴²See TMEP 1207.

⁴³The 2d rejection rate is calculated as the proportion of class-level applications (based on filing year cohort) that received an office action with a 2d rejection (regardless of the eventual outcome of prosecution). For a given incoming trademark application, the 2d rejection is calculated at the class-level one year prior to the filing date.

⁴⁴The opposition rate is calculated as the proportion of published class-level applications (based on publication year cohort) subject to at least one instituted inter partes opposition proceeding (regardless of the outcome). For a given incoming trademark application, the prior opposition rate is calculated at the class-level as the 5-year moving average including the year of filing.

⁴⁵In appendix Figure A-3, the nodes represent the difference between the share of all Madrid filings

risk of trademark squatting more directly, we construct a variable that measures the share of an applicant's Madrid filings in China in a given year (*Share Madrid filing in China*). This variable, therefore, captures the importance of the Chinese market to a company's brand protection strategy. Anecdotal evidence suggests that trademark squatting has been relatively more common in China (Mostert and Wu, 2017), which was also noted by the U.S. Trade Representative in a 2016 report to Congress (USTR, 2017). We expect that companies that rely more on brand protection in China are further exposed to squatting risk and therefore more likely to resort to a submarine strategy. This is confirmed by the statistics shown in Table 4 for both the initial (SUB) and subsequent (N/SUB-SUB) filing.

To test the empirical predictions of our theory further, we specify a logistic regression model of the probability of a submarine trademark filing on our set of metrics. Table 5 presents in columns (1) and (2) the results for the full sample of class filings including both initial (N/SUB) and subsequent filings (N/SUB-N/SUB). Columns (3) and (4) in contrast only includes initial filings (N/SUB). The table reports two specifications: the first specification in columns (1) and (3) includes filing year dummies and applicant-level fixed effects and the specification in columns (2) and (4) also includes Nice class dummies. Both specifications, therefore, rely on within-firm variation consistent with our theoretical framework presented in Section 2 above to estimate the propensity to file a submarine instead of a regular trademark.

Focusing on results shown in columns (1) and (2) first, we see that the coefficients on most measures of trademark and product value - the Nice class count, the product and service class indicator, and G/S ID text length - are positively associated with filing a submarine trademark application. Similarly, the disclaimer indicator, which reflects less distinct marks, is negatively and statistically significantly associated with a submarine filing, as expected. The only value proxy not showing a statistically significant coefficient is the *Design only* variable. One explanation for this result may be the lower risk of disputes for this category of trademarks, as the available design space is vastly more open than the available word space, thus lowering the risk of accidental should rubbing and squatting.⁴⁶

Table 5 also shows that trademarks with prior related marks are less likely to be submarine filings. This confirms the fourth empirical prediction that marks for which a

in a given country that are for submarine trademarks and that of regular trademarks in the comparison set. Blue nodes occur in countries where the submarine share outnumbers the non-submarine share, red where the opposite is true.

⁴⁶The more frequent occurrence of *Design only* trademarks for submarine filings in Table 4 entirely reflects differences in applicant characteristics; in particular, Apple has the highest number of submarine trademarks and also has a high share of *Design only* trademarks. The inclusion of applicant fixed-effects controls for these differences in applicant characteristics.

public product announcement and associated marketing ‘splash’ is important are more likely to be filed using the submarine strategy. Similarly, the acquired distinctiveness indicator is negative and statistically significant, indicating that firms are less likely to use a submarine filing for previously disclosed marks within their trademark portfolio.

Results in Table 5 provide mixed support for the second and third empirical predictions that the likelihood of filing a submarine trademark increases with competition as well as the risk of trademark-related congestion or dispute. The corresponding coefficient on the 2d rejection rate is positive but statistically indistinguishable from zero. This suggests that firms are less concerned by the risk of being blocked by a prior filing when pursuing secrecy through a submarine filing. That said, the opposition rate is positive and significant indicating that, within their trademark portfolios, firms use submarine filing to mitigate the risk of dispute. The coefficients on the Madrid filing indicator and share of Madrid filings in China are positive for both specifications, although in columns (1) and (2), the latter variable is not statistically significant. These marginal effects still suggest that firms are more likely to use submarine filings for trademarks that are part of an international filing strategy.

When we restrict the sample to initial filings in columns (3) and (4), we see that they are largely the same as those in columns (1) and (2), with the exception that the coefficient on Nice class count is insignificant across specifications while that on the share of Madrid filings in China is now statistically significantly different from zero.

For a robustness check, we ran the same logistic regressions for subsamples excluding Apple and Mattel (Table A-1), as filings from both firms make up a large share of the full sample. Results excluding Mattel and Apple are largely the same as in Table 5.⁴⁷

To explore the different trademark types described in Section 5.2 further, we estimate a multinomial logit model and report the marginal effects in Table 6. The results for the SUB and NSUB trademark categories are very similar to Table 5. A first or only submarine filing strategy is more likely for more valuable trademarks, if marketing thunder is important, as part of an international filing strategy, and where exposure to China is higher. The results in columns (3) and (4) show the marginal effects for the N/SUB-SUB and N/SUB-NSUB categories. The marginal effects are very small in magnitude in both columns. Since both categories consist of marks that are associated with multiple trademarks, it is not surprising that more valuable trademarks are more likely to fall into one of the two categories. They also tend to be in more congested classes as indicated by the 2d rejection rate. Interestingly, submarine filings that fol-

⁴⁷The only difference is that the coefficient on the acquired distinctiveness indicator is no longer statistically significant when we exclude Apple from the sample. This is explained by the fact that only a single submarine filing that claims acquired distinctiveness is left in the sample.

Table 5: Determinants of submarine TMs

Variable	Submarine 0/1		SUB v. NSUB	
	(1)	(2)	(3)	(4)
Design only (0/1)	-0.003 (0.006)	-0.004 (0.006)	-0.0002 (0.006)	-0.001 (0.006)
Nice class count	0.003*** (0.001)	0.002** (0.001)	0.001 (0.0009)	0.0002 (0.0008)
Product & Service (0/1)	0.009* (0.005)	0.009* (0.005)	0.013*** (0.004)	0.013*** (0.004)
ln Length of G/S [‡]	0.005*** (0.001)	0.007*** (0.001)	0.005*** (0.001)	0.006*** (0.001)
Disclaimer (0/1)	-0.019*** (0.003)	-0.019*** (0.003)	-0.015*** (0.003)	-0.015*** (0.003)
Prior related mark (0/1)	-0.017*** (0.003)	-0.016*** (0.003)	-0.017*** (0.003)	-0.017*** (0.003)
Acquired distinctiveness (0/1)	-0.018*** (0.006)	-0.017*** (0.006)	-0.015** (0.007)	-0.014** (0.006)
Prior opposition rate [†]	1.171*** (0.336)	5.349*** (1.466)	1.259*** (0.302)	5.294*** (1.166)
2d rejection rate [¶]	0.0006 (0.078)	0.039 (0.133)	-0.010 (0.072)	0.0005 (0.120)
Share Madrid filing in China	0.008 (0.008)	0.009 (0.008)	0.013** (0.006)	0.014** (0.006)
Madrid filing (0/1)	0.037*** (0.008)	0.035*** (0.008)	0.034*** (0.008)	0.031*** (0.007)
Nice class	NO	YES	NO	YES
Filing year	YES	YES	YES	YES
Company	YES	YES	YES	YES
Obs	21,133		20,461	
Submarine	2,075			
SUB			1,808	

Notes: The table shows the marginal effects of a logit regression. The dependent variable is equal to one for all submarine trademark filings. Submarine trademarks are defined as filings with the USPTO by a given applicant that claim priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Tonga, or Trinidad and Tobago. Non-submarine trademarks are filings by a given applicant that are filed directly with the USPTO. SUB: submarine only filing or first submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; NSUB: non-submarine only filing or first non-submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; † Computed at the class-level as 5-year moving average. ‡ G/S: goods and services list. ¶ 2d rejection due to likelihood of confusion computed at the class-level 1 year prior to filing date. The unit of observation is a trademark-class combination. Robust standard errors are clustered at the trademark-level; * p<0.10, ** p<0.05, *** p<0.01.

low previous (non-)submarine filings are positively associated with our variables that capture squatting risk.

Table 6: Determinants of TM types – Multinomial Logit

Variable	SUB	NSUB	N/SUB-SUB	N/SUB-NSUB
	(1)	(2)	(3)	(4)
Design only (0/1)	0.021** (0.009)	-0.015* (0.009)	-0.002*** (0.0005)	-0.003*** (0.001)
Nice class count	0.0007 (0.0009)	-0.001 (0.001)	0.0001*** (0.00003)	0.0003** (0.0001)
Product & Service (0/1)	0.009* (0.005)	-0.011** (0.005)	0.00006 (0.0003)	0.002 (0.001)
ln Length of G/S [‡]	0.009*** (0.001)	-0.010*** (0.001)	0.0001** (0.00005)	0.0006* (0.0003)
Disclaimer (0/1)	-0.014*** (0.004)	0.022*** (0.003)	-0.0008*** (0.0002)	-0.007*** (0.0009)
Prior related mark (0/1)	-0.006* (0.003)	0.004 (0.004)	0.0007 (0.0004)	0.001 (0.001)
Acquired distinctiveness (0/1)	0.007 (0.015)	-0.021 (0.017)	0.003 (0.002)	0.010 (0.007)
Prior opposition rate [†]	0.079 (0.307)	0.144 (0.325)	-0.019 (0.013)	-0.204** (0.094)
2d rejection rate [¶]	0.167* (0.097)	-0.264** (0.101)	0.008** (0.004)	0.085*** (0.022)
Share Madrid filing in China	0.039*** (0.004)	-0.044*** (0.004)	0.0008** (0.0004)	0.004*** (0.001)
Madrid filing (0/1)	0.070*** (0.009)	-0.076*** (0.010)	0.002* (0.001)	0.003 (0.002)
Filing year	YES	YES	YES	YES
Obs			22,318	
Obs by trademark type	1,829	19,889	246	354

Notes: The table shows the marginal effects of a multinomial logit regression. Submarine trademarks are defined as filings with the USPTO by a given applicant that claim priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Tonga, or Trinidad and Tobago. Non-submarine trademarks are filings by a given applicant that are filed directly with the USPTO. SUB: submarine only filing or first submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; NSUB: non-submarine only filing or first non-submarine filing among multiple subsequent (submarine and/or non-submarine) filings for the same mark; N/SUB-SUB: submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark; N/SUB-NSUB: non-submarine filing for a given mark that was preceded by a submarine and/or non-submarine filing on the same mark; † Computed at the class-level as 5-year moving average. ‡ G/S: goods and services list. ¶ 2d rejection due to likelihood of confusion computed at the class-level 1 year prior to filing date. The unit of observation is a trademark-class combination. Robust standard errors are clustered at the trademark-level; * p<0.10, ** p<0.05, *** p<0.01.

6 Conclusion

While submarine trademarks are still small in number, they relate to some of the most prominent products and services introduced in the tech sectors in recent history. They are also growing rapidly. The evidence we presented in this paper shows, first of all, that submarine filing strategies work. Submarine trademarks see fewer Google searches than non-submarine trademarks before underlying products are publicly announced. In addition, we offer evidence on what makes firms adopt submarine filing strategies. They do so for more valuable goods and services, for trademarks that are more likely to be opposed by third parties and for trademarks for which they will eventually seek protection in international markets. Submarine strategies seem especially important when companies first present new brands to the public and pursue high-profile launches seeking emotional responses from potential buyers. However, they also seem to play a role in keeping the nature of their upcoming products secret from competitors.

As argued in the introduction, the presence of submarine filing practices suggests that brand owners derive private benefits from delaying the disclosure of their trademark applications. If as a result they face fewer legal conflicts and less risk when investing in new product launches, at least part of the private benefit translates into a social benefit. But there is a potential social cost as well: submarine trademarks could reduce the transparency of the trademark register which increases uncertainty for other users of the system. In particular, legitimate trademark applicants may face conflicts with surfacing submarines when they have already sunk substantial investments in developing their brand.

Whether the benefits of delayed disclosure exceed its costs is an empirical question to which our analysis does not offer any guidance. But it is worth noting that different answers may lead to radically different policy conclusions. If the benefits outweigh the costs, it may be desirable to explicitly introduce a delayed disclosure option in the trademark application process. Most countries offer such an option for industrial design applications (or design patent applications in U.S. parlance). Delayed disclosure in this case precisely seeks to enable design applicants to file for exclusive rights before disclosing their new product designs to the public. However, in contrast to trademarks, industrial designs have to be new to qualify for protection, which arguably reduces the risk of two applications accidentally rubbing shoulders.

If the costs of delayed trademark disclosure outweighs its benefits, submarine practices should be banned. In economic terms, countries that do not promptly disclose incoming trademark filings impose a negative externality on the rest of the world. Given that most of the current submarine jurisdictions are developing economies, this

externality could be internalized by helping IP offices in those jurisdictions put in place searchable online trademark databases.

In the current environment, submarine strategies introduce a delayed disclosure option for the most sophisticated and resourceful applicants. Even if delayed disclosure were to offer societal benefits, submarine strategies are unlikely the most efficient policy response to help brand owners solve the dilemma they face when timing their trademark applications. More empirical research aimed at better understanding the social costs of delayed disclosure would be helpful in charting a better policy response.

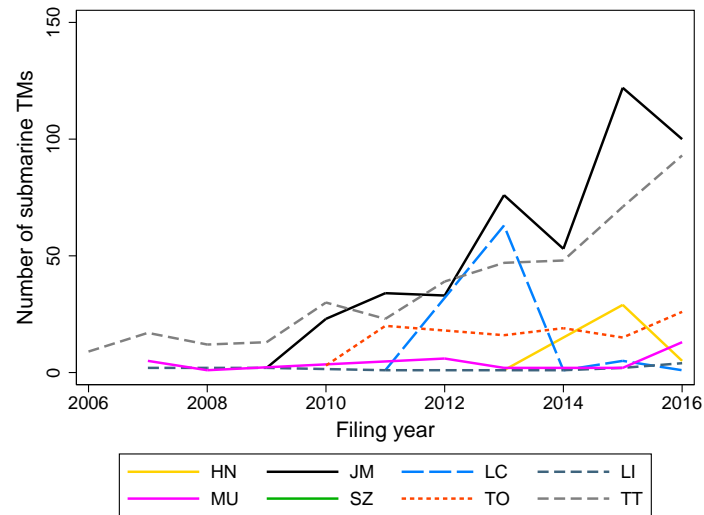
References

- [1] Beebe B. and J. C. Fromer (2018): 'Are we running out of trademarks? An empirical study of trademark depletion and congestion,' *Harvard Law Review*, Vol. 131 (4), pp. 945-1045.
- [2] Block J., G. De Vries, J. Schuman, P. Sandner (2014): 'Trademarks and venture capital valuation,' *Journal of Business Venturing*, Vol. 29(4), pp. 525-542.
- [3] Bronnenberg B.J. and J.P Dube (2017): 'The Formation of Consumer Brand Preferences,' *Annual Review of Economics*, Vol. 9, pp. 353-382.
- [4] Dinlersoz E., N. Goldschlag, A. Myers, and N. Zolas (2018): 'An Anatomy of U.S. Firms Seeking Trademark Registration,' *USPTO Economic Working Paper No. 2018-02*.
- [5] Edeling A. and M. Fisher (2016): 'Marketing's impact on firm value: Generalizations from a meta-analysis,' *Journal of Marketing Research*, Vol. 53(4), pp. 515-534.
- [6] Ertekin L., A. Sorescu, M.B. Houston (2018): 'Hands Off My Brand! The Financial Consequences of Protecting Brands Through Trademark Infringement Lawsuits,' *Journal of Marketing*. In-Press.
- [7] Fazio C., J. Guzman, F. Murray, and S. Stern (2016): 'A New View of the Skew: A Quantitative Assessment of the Quality of American Entrepreneurship,' In *Kauffman Foundation New Entrepreneurial Growth*, Kansas City, MO.
- [8] Fosfuri A. and M. Giarratana (2009): 'Masters of War: Rivals' Product Innovation and New Advertising in Mature Product Markets,' *Management Science*, Vol. 55(2), pp. 181-191.
- [9] Fink C., C. Helmers, C. Ponce (2018): 'Trademarks Squatters: Theory and Evidence from Chile,' *International Journal of Industrial Organization*, Vol. 59, pp. 340-371.
- [10] Gentzkow M., B. T. Kelly, and M. Taddy (2017): 'Text as Data,' *NBER Working Paper No. 23276*.
- [11] Graham S., G. Hancock, A.C. Marco, A. Myers (2013): 'The USPTO Trademark Case File Dataset: Descriptions, Lessons, and Insights,' *Journal of Economics & Management Strategy*, Vol. 22(4), pp. 669-705.
- [12] Greenhalgh C. and M. Rogers (2012): 'Trade Marks and Performance in Services and Manufacturing Firms: Evidence of Schumpeterian Competition through Innovation,' *Australian Economic Review*, Vol. 45(1), pp. 50-76.

- [13] Guiltinan J.P (1999): 'Launch Strategy, Launch Tactics, and Demand Outcomes,' *Journal of Product Innovation Management*, Vol. 16(6), pp. 509-529.
- [14] Hall B., C. Helmers, M. Rogers, V. Sena (2014): 'The choice between formal and informal intellectual property: a review,' *Journal of Economic Literature*, Vol. 52, pp. 1-50.
- [15] Krasnikov A., S. Mishra, D. Orozco (2009): 'Evaluating the Financial Impact of Branding Using Trademarks: A Framework and Empirical Evidence,' *Journal of Marketing*, Vol. 73(6), pp. 154-166.
- [16] Mostert F. and G. Wu (2017): 'The importance of the element of bad faith in international trade mark law and its relevance under the new Chinese trade mark law provisions,' *Journal of Intellectual Property Law & Practice*, Vol. 12(8), pp. 650-659.
- [17] Rindova V.P. and A.P. Petkova (2007): 'When is a new thing a good thing? Technological change, product form design and perceptions of value for product innovations,' *Organization Science*, Vol. 18(2): pp. 217-232.

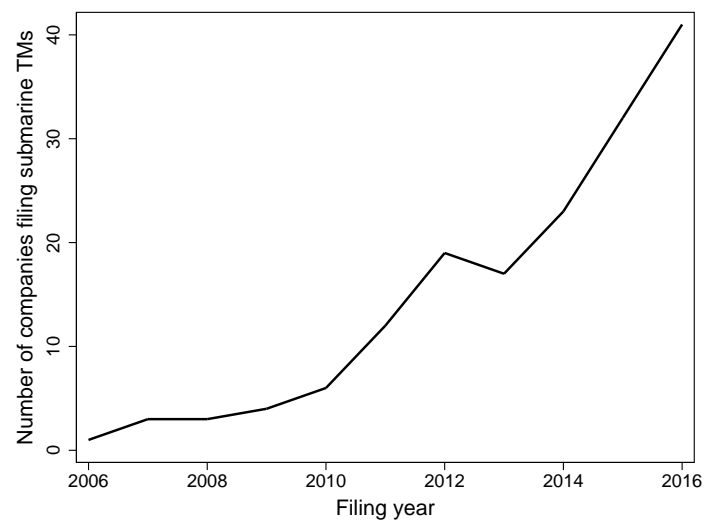
APPENDIX

Figure A-1: Submarine filings by submarine jurisdiction



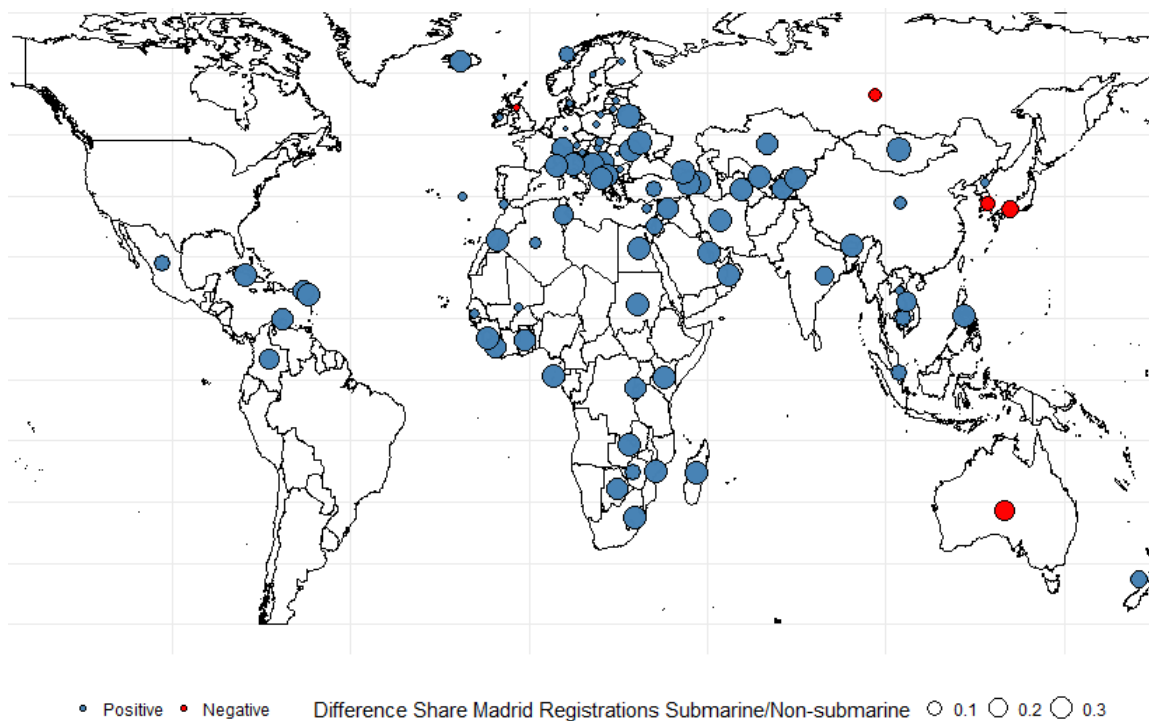
This figure shows the total number of trademark filings with the USPTO between 2002-2016 by a given applicant that claim priority in Honduras (HN), Jamaica (JM), Liechtenstein (LI), Mauritius (MU), Saint Lucia (LC), Swaziland (SZ), Tonga (TO), or Trinidad and Tobago (TT).

Figure A-2: Number of companies filing submarine trademarks



This figure shows the total number companies that filed at least one trademark with the USPTO between 2002-2016 that claims priority in Honduras (HN), Jamaica (JM), Liechtenstein (LI), Mauritius (MU), Saint Lucia (LC), Swaziland (SZ), Tonga (TO), or Trinidad and Tobago (TT).

Figure A-3: Madrid filings



This figure shows the distribution of trademark filings via the Madrid system across offices where trademark protection was sought via a Madrid filing.

Table A-1: Determinants of submarine TMs

Submarine 0/1	Excl. Apple		Excl. Mattel	
	(1)	(2)	(3)	(4)
Design only (0/1)	0.0007 (0.006)	0.0002 (0.006)	-0.006 (0.008)	-0.006 (0.007)
Nice class count	0.002*** (0.001)	0.002** (0.001)	0.004*** (0.001)	0.003** (0.001)
Product & Service (0/1)	0.014*** (0.005)	0.013*** (0.005)	0.014** (0.007)	0.013** (0.007)
ln Length of G/S [‡]	0.005*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.007*** (0.001)
Disclaimer (0/1)	-0.022*** (0.003)	-0.021*** (0.003)	-0.023*** (0.005)	-0.023*** (0.005)
Prior related mark (0/1)	-0.015*** (0.003)	-0.015*** (0.003)	-0.021*** (0.005)	-0.020*** (0.005)
Acquired distinctiveness (0/1)	-0.012 (0.017)	-0.012 (0.015)	-0.023*** (0.008)	-0.022*** (0.008)
Prior opposition rate [†]	0.932*** (0.292)	4.565*** (1.272)	1.311*** (0.432)	6.418*** (1.974)
2d rejection rate [¶]	0.021 (0.067)	0.071 (0.116)	0.007 (0.100)	0.056 (0.176)
Share Madrid filing in China	0.001 (0.006)	0.002 (0.006)	0.012 (0.010)	0.013 (0.010)
Madrid filing (0/1)	0.025*** (0.008)	0.023*** (0.007)	0.047*** (0.010)	0.043*** (0.010)
Nice class	NO	YES	NO	YES
Filing year	YES	YES	YES	YES
Company	YES	YES	YES	YES
Obs	20,114		16,832	
Submarine	1,577		2,005	

Notes: The table shows the marginal effects of a logit regression. The dependent variable is equal to one for all submarine trademark filings. Submarine trademarks are defined as filings with the USPTO by a given applicant that claim priority in Honduras, Jamaica, Liechtenstein, Mauritius, Saint Lucia, Tonga, or Trinidad and Tobago. Non-submarine trademarks are filings by a given applicant that are filed directly with the USPTO. [†] Computed at the class-level as 5-year moving average. [‡] G/S: goods and services list. [¶] 2d rejection due to likelihood of confusion computed at the class-level 1 year prior to filing date. The unit of observation is a trademark-class combination. Robust standard errors are clustered at the trademark-level; * p<0.10, ** p<0.05, *** p<0.01.