

The Strategic Value of Trademarks:

Evidence from Maintenance Data

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June 2015

Abstract

U.S. trademark registrations can be maintained indefinitely so long as the mark remains in use. Yet, little research has been done on trademark longevity or what the observed maintenance data can tell us about how firms use trademarks. Importantly, the use requirement for trademark maintenance provides a unique window into trademark value. Provided that registration maintenance decisions are based on economic criteria, trademark owners will opt to maintain registrations only when the return accrued to the brand or goodwill from federal registration exceeds the costs of maintenance and enforcement. Thus, trademark maintenance decisions reflect firms' brand strength but also capture the success or failure of new product offerings by incumbents or entrants. Results indicate a "die or thrive" dynamic whereby class registrations face a high risk of death during the initial years of registration, particularly at sixth-year maintenance, but those that survive the second maintenance event are likely to be continuously renewed.

We employ nonparametric survival analysis to highlight significant differences in registered class survival across key trademark characteristics. Class registration survival curves show a heightened risk for novel marks filed on an "intent-to-use" basis compared to "incumbent" marks already in use in commerce, whether held by domestic or foreign owners. There is considerable variation in registration survival across Nice classes (both goods classes and service classes) and also for individual products. Classes and products associated with rapid technology change exhibit relatively lower maintenance rates. Results further suggest that so-called brand "association" marks may afford more value than "identification" marks, though the strength of association devices is conditional on some degree of existing brand awareness and the value of "senior" marks within the same

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portfolio. The volatility that new class registrations face points to high product-, firm-, and mark-turnover expected in competitive markets but also reflects strategic branding in terms of product expansion and mark experimentation. We estimate parametric survival models to consider the relative magnitude of these factors on maintenance decisions.

Keywords: Intellectual Property, Trademarks, Branding

JEL Classification Numbers: O3, L2, G1, G2, G3

1 Introduction

A U.S. trademark registration can be maintained indefinitely so long as the trademark remains in use. Yet, little is known about trademark longevity or the maintenance and renewal decisions of registrants. The few empirical studies using trademark data focus on trademark filings or registration stocks, paying little to no attention to the duration of registration lives. This paper is an initial investigation into the incentives for trademark renewal and the determinants of trademark value. Provided that registration renewal decisions are based on economic criteria, trademark owners will opt to renew registrations only when the return accrued to the brand or goodwill from federal registration exceeds the cost of renewal and enforcement.

This paper examines the outcomes of maintenance and renewal decisions using survival analysis. Our focus is on what the observed renewal data can tell us about how firms use trademarks and the distribution of the value of trademark rights. The 2014 release of the *USPTO Trademark Case Files Dataset* (hereafter “*Case Files*”), described in detail by Graham et al. (2013), provides a rich data source for exploring registration survival based on various mark characteristics.¹

Our intention in this paper is to initiate the dialogue and, thereby, stimulate further inquiry in noteworthy areas regarding trademark value, longevity, and relationship between renewal outcomes and innovation, competition, and branding.

2 Legal Background

In the United States, trademarks are subject to a *use requirement*, which requires that an entity use its mark on or in connection with the sales of goods or services in order to establish and maintain trademark rights. The use requirement derives from American common law and subsequent codification in federal statute.² An entity establishes and can enforce common law trademark rights solely by using a mark in commerce. A federal

¹ Case Files is available for download at http://www.uspto.gov/ip/officechiefecon/tm_casefiles.jsp. For a thorough description of these data, see Graham, S., Hancock, G., Marco, A. and Myers, A. (2013). “The USPTO Trademark Case Files Dataset: Descriptions, Lessons, and Insights.” SSRN working paper, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2188621 (“Case Files”).

² Under American 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 as to the source of the goods and services offered under the mark. An entity establishes trademark rights solely by using the mark on or in connection with goods and services. Registration at the state or federal level provides additional benefits but is not necessary for an entity to create and enforce common law trademark rights. The Lanham Act of 1946 established the modern U.S. federal trademark registration system, providing for protection of trademarks used in commerce and registered with the USPTO. 15 U.S.C. §1051 et seq.

U.S. trademark registration confers considerable benefits beyond common law, particularly national-scope rights and access to federal court.³

Upon filing for registration, each applicant must specify the goods and services on which he uses or intends to use the mark. Applicants must use goods and services identification statements (here after “IDs”) that meet statutory and regulatory requirements for specificity.⁴ Still, acceptable IDs can be specific (“Passenger and light truck tires”) or more general (“Tires”).⁵ The USPTO classifies IDs for administrative purposes. Since September 1, 1973, the USPTO has applied the International Classification of Goods and Services under the Nice Agreement (the so-called “Nice Classification”). There are currently 45 Nice classes, including 34 goods classes for goods marks (or “trademarks”) and 11 services classes for service marks.⁶ [Appendix I includes descriptions and sample IDs for each Nice class.] There is no international classification system for certification or collective marks. In general, a certification mark is used by an entity other than the owner to certify that goods or services originate in a specific geographic region or meet certain standards.⁷ For instance, the certification mark featuring the characters “GROWN IN IDAHO” is registered for use on “POTATOES” and certifies “...REGIONAL ORIGIN”.⁸ Collective membership marks are used by members of a cooperative, association, or other collective group to identify and distinguish membership.⁹ For example, “PGA PROFESSIONAL” is a registered collective membership mark “indicating membership in an association of golf professionals”.¹⁰ While other countries classify these types of marks in Nice Classes, the USPTO assigns unique U.S. Classes to certification and collective membership marks.¹¹ Collective marks that membership groups use to identify their goods and services are called “collective trademarks” and “collective service marks,” respectively. The USPTO applies Nice classes these marks in the same manner as goods and service marks.

Once issued, a U.S. trademark registration can be renewed indefinitely by the owner, so long as the mark remains in use for the goods and services identified in the registration and all appropriate fees have been paid. Figure 1 depicts the timeline for maintenance and renewal requirements. In the sixth year after issuance, a registrant must maintain the registration by filing an acceptable affidavit or declaration of continued use (or excusable

³ See Case Files §3.

⁴ IDs define the scope of the trademark registration protection and are, in general, akin to claims in a patent application. See TMEP § 1402.

⁵ See Case Files § 4.1.2 for a detailed treatment of IDs.

⁶ Prior to 1973, the United States used its own classification system. This paper examines only trademarks registered under the Nice Classification system. See Case Files § 4.1.2.2 for a detailed treatment of goods and services classification.

⁷ See TMEP § 1306.06.

⁸ U.S. Reg. No. 631499.

⁹ See TMEP § 1302-5.

¹⁰ U.S. Reg. No.1740430.

¹¹ See Case Files § 4.1.2.3 for a detailed treatment of certification and collective marks.

nonuse) with the USPTO.¹² Failure to do so results in cancellation because the mark is considered no longer in use for the listed goods and services. If maintained, the registration will remain in force for an additional ten-year period from the registration date. In the tenth year, and at each successive ten-year period thereafter, the registrant must again establish use to maintain the registration as well as file a renewal application to avoid expiration.¹³ Ten-year renewal terms have been effective for registrations issued on or after November 16, 1989 (hereafter “T10” registrations). Prior to that date, registrations were maintained and renewed at successive twenty-year periods. Registrations issued under the initial regime (hereafter “T20” registrations) retained the twenty-year term until the first renewal event following the change and were limited to ten-year renewal terms thereafter (see lower panel of Figure 1). Thus, all live registrations were subject to ten-year renewal terms as of November 16, 2009.

Registrants must pay separate maintenance and renewal fees for each class in which the goods or services are classified. The current fee is \$100 per class for filing an affidavit or declaration of continued use to maintain a registration and \$400 per class for filing a renewal application to renew the registration for an additional ten-year term.¹⁴ Maintenance and renewal are considered distinct requirements from a legal perspective. But failure to comply with either requirement results in the death of some or all classes in the registration. For simplicity sake, we refer to the sixth year event and each ten-year or twenty-year event as maintenance only.

3 Literature

The existing literature generally views trademarks through three different, but related, perspectives. First, the principal economic theory views a trademark as an information signal to promote market efficiency. As source-indicating devices, trademarks convey information regarding product quality and consistency to reduce information asymmetry (Akerlof 1970; Economides 1987) and search costs (Landes and Posner 1987). Trademark holders are thus incentivized to invest in goodwill to reap rewards from the

¹² 15 U.S.C. §§1058(a)(1) and (a)(3). This requirement applies to registrations issued under §1 and §44 of the Lanham Act or under the Trademark Acts of 1881 and 1905 for which the owner has claimed the benefits of the Lanham Act under §12(c). *See* TMEP §1604.01. With any affidavit or declaration filing, the owner must provide specimen(s) depicting use of the mark for the listed goods and services and pay the prescribed maintenance fees per class. If the affidavit does not cover all goods and services, it must specify those for which the mark is no longer in use to be deleted from the registration. To claim excusable nonuse for particular goods or services, the affidavit must indicate when use stopped and is expected to resume and show that nonuse is due to special circumstances. *See* 37 CFR §2.161. If the affidavit is not filed within the statutory time limit or does not meet statutory requirements, the registration is treated as cancelled. There is a six-month grace period during which registrants may file an affidavit for an additional fee.

¹³ 15 U.S.C. §1059(a). If the renewal application is not filed within the statutory time limit or does not meet statutory requirements, the registration expires as of the end of its term. There is a six-month grace period during which registrants may file a renewal application for an additional fee.

¹⁴ USPTO fee schedule effective March 19, 2013, *see* <http://www.uspto.gov/about/offices/cfo/finance/fees.jsp>.

reputational value exemplified by the mark (Landes and Posner, 1987). More recent literature asserts the potential for trademarks to transcend source-identifying uses. Trademarks can embody status goods that consumers employ to signal status or image (Beebe 2004) and become valuable intangible assets that owners apply to promote barriers to entry, market power, and rent-seeking behavior (Lemley 1999; Ramello, 2006).

A second perspective considers trademarks to be the legal foundation or counterpart of brand equity. The marketing literature provides two conceptual frameworks for examining brand equity (Keller and Lehman, 2006). The consumer-based framework assesses brand equity based on the differential effect that brand knowledge has on consumer behavior (Keller, 1993). The financial-market view emphasizes brand equity in terms of financial outcomes such as the impact of branding efforts on shareholder value (e.g., Kerin and Sethuraman, 1998). While some research aims to connect the two frameworks (e.g., Mizik and Jacobson, 2008; Shankar et al., 2008; Krasnikov et al., 2009), we focus on the consumer-based view because the financial view would require linking Case Files data to firm-level data. While we encourage such an endeavor, it is beyond the scope of this paper.

Within the consumer-based framework, brand equity has two components: awareness and associations. Brand awareness relates to the extent that consumers identify and distinguish the brand's products in the marketplace. So-called "identification (or identifying) trademarks," such as names and logos, serve to build brand awareness among consumers (Krasnikov et al., 2009). The brand value of an identification trademark depends on the extent to which they stimulate consumer recognition in a crowded product space (Henderson and Cote, 1998) and perform as a predictive signal of product performance to consumers (Erdem and Swait, 1998). Thus, identification trademarks are consistent with traditional economic theory, which treats trademarks as source-indicating devices to reduce information asymmetry and search costs.

Associations comprise the specific product characteristics that consumers connect with the brand and consumer perceptions of the brand's imagery or personality (e.g., Srinivasan et al., 2005; Mizik and Jacobson, 2008). So-called "association trademarks" capture the connotations consumers attach to brands through design elements (e.g., color, packaging, shape) or informational channels (e.g. slogans, imagery) (Krasnikov et al., 2009). The value of association trademarks lies in how they affect consumers' brand-related attitudes. Strong and complex associations give consumers greater confidence in their attitudes (Pullig et al., 2006), rendering them less prone to attitude change or dilution (Pham and Muthukishnan, 2002) and less susceptible to competitors' attempts toward that end (Pechmann and Ratneshwar, 1991). Firms may further capitalize on

strong brand associations to facilitate entry into new product markets through brand extension (e.g. Dacin and Smith, 1994) or expand licensing opportunities (Jacoby, 2001). Association trademarks conform to more recent theory regarding trademark use transcending source identification and serving to promote of market power.

We find the distinction between identification and association trademarks instructive as we consider survival distributions across key groups in Section 5. Trademarks deployed in the market to serve these separate objectives are likely to have differing value and registration longevity.

The third perspective, from empirical economic literature, largely focuses on the relationship between trademarks and innovation or firm performance. Schautschick and Greenhalgh (2012) provide a survey of empirical research in trademarks. Studies generally find that trademarks, often in combination with other forms of IP, are a useful measure of innovative activity, though more so for certain sectors and forms of innovation. In particular, trademark registration is positively and significantly associated with R&D intensity (Allegrezza and Guard-Rauchs, 1999) and the share of turnover achieved via innovative products in high-tech manufacturing and knowledge-intensive services (Schmoch, 2003; Gotsch and Hipp, 2012). Empirical literature on firm performance largely finds a positive relationship between trademark activity and stock market values (Seethamraju, 2003; Bosworth and Rogers, 2001; Griffiths and Webster, 2006), particularly in service sectors (Greenhalgh and Rogers, 2006; Greenhalgh and Rogers, 2012), as well as firm productivity (Greenhalgh and Longland, 2005); profitability (Griffiths, Jensen and Webster, 2011) and survival (Jensen et al., 2008; Buddelmeyer et al., 2010; Helmers and Rogers, 2010). Note that the vast majority of empirical literature on trademarks examines European or Australian data, and few studies utilize U.S. trademark data (see Graham et al. 2013).

Across these three perspectives, little attention is paid to trademark longevity or the maintenance and renewal decisions of registrants, especially as they relate to the firm's trademark portfolio. The empirical work, in particular, has largely focused on trademark filings or registration stocks without accounting for the duration of registration lives or what the outcome of renewal decisions conveys about trademark value. In contrast, patent renewal literature is extensive. Both Kortum (1997) and Lanjouw, Pakes, and Putnam (1998) provide a survey of patent renewal literature.

[marketing/brand strategy literature]

[brand/product turnover literature]

4 Data

Data for survival analysis come from the 2014 release of the USPTO Trademark Case Files Dataset (hereafter “*Case Files*”). We use a sample of [2.0 million registrations, comprising 2.4 million classes], issued between 1977 and 2006. We omit registrations issued prior to 1977 as both births and deaths are only fully observable in *Case Files* starting with registrations issued in that year.¹⁵ We also exclude registrations issued after 2006 because we have yet to observe the outcome of sixth year maintenance due to recordation lag (discussed in more detail below).

The vast majority of registrations are issued for a single class. Only about 12 percent of registrations in our data were issued for more than one class. Because maintenance and renewal requirements apply separately for each class, we examine survival at the registered class-level. In this context, the distinction between single and multiple class registrations is irrelevant as the same mark protection is achieved, and value thereby derived, through multiple single-class registrations or one multiple-class registration.

We ignore partial class cancellations where a subset of the goods or services listed is cancelled for nonuse but the remaining goods or services persist in use.¹⁶ While the incidence of a partial cancellation is observable in the *Case Files*, the timing of the cancellation for a particular good or service is not captured. Since only the duration from issuance to recorded class death is known, we focus on survival at the class-level.¹⁷

We estimate registered class survival from the date of issuance to the date a cancellation or expiration was recorded. The recordation date generally lags the legally effective date because the USPTO only updates records to show a class is cancelled or expired 30 days after the expiration of the six-month grace period.¹⁸ For example, a registration issued on January 1, 2000 would be subject to maintenance requirements in sixth-year of registration, i.e. between January 1, 2005 and January 1, 2006. If maintenance requirements are not met, the registration is effectively cancelled on January 1, 2006, but the Office may not update administrative records to reflect the cancellation until roughly seven months after that date. Thus, most cancellations are recorded between the sixth and seventh year of registration even though the class is effectively cancelled at the end of the

¹⁵ See Case Files §5.1.

¹⁶ At each maintenance event, the registrant must file an affidavit or declaration affirming continued use of the mark on the goods and services in the ID for each class. If the affidavit or declaration does not cover all of the goods and services in the ID, it must specify the goods and services to be deleted from the registration. Any deleted goods or services will appear in enclosed brackets in the ID in Case Files. For example, in the ID “[CHEWING GUM AND] CANDY,” the owner removed “CHEWING GUM” from the goods listed but maintained registration of the mark for use in connection with the sale of “CANDY”. U.S. Reg. No. 523876. See Case Files §5.2.5.1.

¹⁷ The date of partial cancellations may be inferred from the registration cancellation date field in the Case Files Dataset. However, if a full class cancellation occurs after a partial cancellation, the cancellation date will be revised to reflect the later date. The partial cancellation date does not appear to be captured elsewhere in the data.

¹⁸ See TMEP §1611.

sixth year. Note also that the recordation lag is time variant and may be longer (or shorter) for older cohorts in our sample.¹⁹ Accordingly, when discussing maintenance and renewal rates, we generally focus on the proportion of classes estimated to survive to the second year following the event.²⁰

5 Graphical Evidence

In this section, we examine maintenance and renewal outcomes using Kaplan-Meier survival curve estimation. Kaplan-Meier estimation is a nonparametric method of summarizing duration data for one or more groups. Survival curves show the proportion of subjects which have not yet experienced some event. In this case, the survival curve estimates the proportion of class-level registrations yet to experience death through cancellation or expiration. Survival analysis is appropriate in this context because data on the duration of registration lives are censored by the data upload date. We initially opt for a nonparametric approach to highlight significant differences in registered class survival across observable characteristics but still avoid making potentially questionably or problematic assumptions about the distribution of trademark registration value.²¹ Table 1 shows the frequency of registered classes by observable characteristics. While we discuss potential drivers of significant differences in class survival across groups, these hypotheses require further inquiry to be substantiated.

5.1 Renewal Term Regime

Figure 2 compares estimated survival curves at years from the registration issuance date for registered classes in T10 and T20 renewal term regimes. The sixth-year maintenance event (hereafter “M6”) and subsequent maintenance/renewal events (at the tenth year “M10”, twentieth year “M20”, and thirtieth year “M30”) are indicated in gray. Survival curves exhibit sharp declines following maintenance events, when the risk of death is highest, and are largely flat between such events, when the risk of death is relatively minimal. A registration, or a subset of classes within, may be cancelled voluntarily or as a result of court order or *inter partes* proceeding at any point following issuance. Yet, such

¹⁹ Prior editions of the TMEP, the most recent being the Fifth Edition issued October 2007, state that Office records are not updated show that a registration is cancelled or expired until *three* months after the expiration of the grace period. *See* TMEP archived editions http://www.uspto.gov/trademarks/resources/TMEP_archives.jsp.

²⁰ The effective date can be inferred when the cancellation or expiration is recorded following a maintenance or renewal event. However, when cancellations occur outside of these events, e.g. due to voluntary surrender or third-party challenge, the effective date cannot be inferred. We use the recorded cancellation or expiration date because it is captured in the Case Files dataset for all cancelled or expired classes. *See* Case Files § 4.2 and § 5.2.1.

²¹ For more details on non-parametric, semi-parametric, and parametric methods for survival regressions, *see* Box-Steffensmeier, J. M.; Jones, B. S. (2004). *Event History Modeling: A Guide for Social Scientists*. Cambridge: Cambridge University Press. Cleves, M.; Gutierrez, R. G.; Gould, W.; Marchenko, Y. V. (2010). *An Introduction to Survival Analysis Using Stata* (3rd edition). College Station: Stata Press. Chapter 1, 17.

deaths are rare, comprising only about 1.6 percent of dead classes in our sample, and have no observable impact the downward, step-like shape of the survival curves.²²

T10 and T20 curves are virtually the same until the tenth year from issuance and diverge considerably thereafter due to differences in the timing of maintenance events. Both curves decline considerably after the sixth year from issuance, indicating that roughly 46-47 percent of registered classes in each regime are expected to survive M6, on average. The drop in each survival curve after M6 is roughly equivalent, suggesting that the useful life of most registered classes is less than six years regardless of issuance date. Following M6, survival curves are largely flat until ten years after issuance for T10 classes and twenty years after issuance for T20 classes. At the end of the first term in year 20, roughly 18 percent of T20 classes, on average, are expected to survive M20 to a second (ten-year) term. By comparison, 31 percent of T10 classes are expected to survive M10 to a second term. Figure 1 shows that the vast majority of classes surviving through two terms are expected to be maintained for a third. This is evident by the small decline in the survival curve after year 20 for T10 classes and year 30 for T20 classes.

- *Registered classes exhibit a “die or thrive” dynamic whereby classes face a high risk of death at M6 and first renewal but those that survive are likely to endure.*

Figure 2 indicates a "die or thrive" dynamic whereby registrations face a high risk of death at M6 and first renewal (R10 for T10 classes and R20 for T20 classes). Those that survive the first renewal event are likely to be continuously renewed. This is consistent with our anticipation of a highly skewed value distribution for trademarks.

Since survival curves are largely flat between maintenance events, in the following sections, we focus on post-event survival, plotting only the survival estimates for the period following events. This allows for comparison of maintenance and renewal outcomes without muddling graphs with numerous survival curves. Additionally, because survival curves differ significantly after M6 for the two renewal term regimes, we plot survival estimates for T10 and T20 classes separately.

5.2 Mark Type and Classification

Figure 3 presents survival estimates at M6 and relevant renewal events for registered classes based on whether the mark is used on goods or services or consist of a certification or collective mark. Goods marks are registered in one of the 34 Nice goods classes and service marks in one of the 11 Nice service classes. We identify certification and collective marks using registration-level indicators in the *Case Files* dataset.

²² See Case Files § 4.2

- *Registered classes for certification and collective marks have the highest expected longevity.*

It is quickly evident in Figure 3 that registered classes for certification and collective marks have higher expected survival relative to marks registered in only goods or service classes. A sizeable majority of registered classes for certification and collective marks survive M6, and a relatively large proportion survives M6 and two renewal events.

Certification and collective marks are different and distinct devices.²³ Certification marks are used by parties other than the registrant to certify that goods or services originate in a specific geographic region, meet certain standards, or feature specified characteristics; whereas collective marks are owned by a collective group and used by its members to identify and distinguish membership and/or the goods and services of the group.²⁴ Still, the similarity, and relative dominance, of survival curves for these marks relative to other mark types is likely rooted in their commonalities. Both certification and collective marks are characterized by dispersed value and maintenance cost but concentrated ownership. Certification marks distinguish the entire product market (or a sizeable subset) rather than an individual supplier. Thus, competing parties share a collective interest in maintaining the mark's commercial use and cooperatively enhancing its brand value among consumers. A comparable argument may be made for collective marks that represent professional organizations, such as "REALTORS" and "FEDERAL BAR ASSOCIATION".²⁵ Certification and collective marks are typically owned by a single authority or association, which further supports mark longevity because administrative and enforcement activities are concentrated while costs are spread across multiple users or members.

- *Goods marks exhibit significantly higher survival than service marks.*

In Figure 3, class survival estimates for goods marks are persistently higher than those for service marks. The distance between estimates is not large in magnitude, though it is statistically significant and consistent across events and T10 and T20 classes. As we discuss in more detail in Section 5.2.1, there is considerable variation in survival estimates across Nice classes such that comparison at the macro goods- versus services-level may be of little value. Still, Figure 3 suggests a persistent difference in the value

²³ A mark registered as a certification mark is not registrable as any other type of mark. *See* TMEP §1306.05(a).

²⁴ Collective marks that identify and distinguish group members are termed collective membership marks. Marks that collective groups use to distinguish the group's goods and services are collective trademarks and collective service marks, respectively. All references to collective marks in this paper encompass collective membership marks, collective trademarks, and collective service marks. *See* Case Files §4.1.2.3.

²⁵ U.S. Reg. No. 515200 and U.S. Reg. No. 1765796, respectively.

derived from marks used on goods compared to those used on services. One possible explanation is that goods marks are superior in terms of identification and association value because they are more likely to be used directly on products or items tangible to consumers. Service marks, in contrast, tend to be used in a more indirect manner through sale or advertising channels.²⁶ Thus, service marks may be weaker source-identifying devices and highly limited as association marks.

5.2.1 Nice Classification

Before we examine survival by Nice classification, some caution is in order. Deciphering the potential drivers of variation in survival estimates across Nice classes is problematic for a number of reasons. First, individual Nice classes have broad coverage, encompassing numerous and diverse industries and product markets. Even those classes with relatively narrow coverage, such as class 13 (firearms), may contain multiple, distinct products (“*firearms; ammunition and projectiles; explosives; fireworks*”).²⁷ Second, Nice classification may reflect the channel through which goods and services are sold or marketed rather than the owner’s primary business activity. For example, class 35 (advertising and business) generally includes all retail activity, whether brick and mortar or electronic, no matter the actual goods or services sold. In this context, survival estimates will capture, to some extent, the efficacy of the channel through which the mark, and thereby the brand, is conveyed to consumers. Finally, due to periodic revisions in the Nice classification system, classes may not be directly comparable over time.²⁸ This is particularly germane to services classes which were substantially restructured in 2002 when classes 43, 44, and 45 were created to cover services previously included in class 42.²⁹ To simplify plots, we limit survival analysis by Nice classification to only T10 classes. [Appendix X contains a comparable plot of survival estimates by Nice classification for T20 classes.]

In Figure 4, we present survival estimates by Nice service class as well as for service certification and collective membership marks. We group class 42 (computer and

²⁶ A service mark specimen must show that the mark as actually used in the sale or advertising of the services identified in the application. 37 CFR §2.56(b)(2). See TMEP §1301.04.

²⁷ Nice class 13 explanatory note, see TMEP §1401.02(a).

²⁸ The WIPO Committee of Experts of the Nice Union decides on all changes to the international classification system. Registrations remain classified according to the system in force at the time of registration (unless the registrant request reclassification). For information on the current and prior editions, see http://www.wipo.int/classifications/nice/en/nice_archives.html.

²⁹ The 8th edition of the Nice Agreement, effective January 1, 2002, created classes 43 (hotels and restaurants), 44 (medical, beauty and agricultural), and 45 (personal) to cover services previously included in class 42 (computer and scientific) which served as a catch-all for “services that cannot be classified in other classes”. The 9th edition, effective January 1, 2007, transferred all legal services from class 42 to class 45.

scientific) with classes 43 (hotels and restaurants), 44 (medical, beauty and agricultural), and 45 (personal and legal) to preserve comparability with the other service classes.³⁰

- *Marks registered for use in connection with construction/repair and transportation/storage services endure while the majority of classes registered in telecommunication do not survive M6.*

Service marks registered in class 38 (telecommunications) are expected to be the shortest-lived. Estimates suggest that roughly one-third of T10 class 38 registrations survive M6 and only about 15 percent survive R20. Provided that the telecommunication industry is characterized by rapidly changing technology and highly competitive firms, it is not surprising that registrations in this class are relatively brief. However, estimated survival rates for T20 classes in class 38, while still the lowest, are more comparable to those of other service classes. We suspect, as deregulation and innovation largely transformed the telecommunications industry, two factors weakened mark survival. First, start-ups and new entrants, having a higher probability of exit than incumbent firms, increased registrant turnover.³¹ Second, as innovative firms gain comparative advantage, (incumbent) competitors engage in innovation to regain market share³², resulting in shorter product life cycles and an aggressive marketing environment that abbreviate the useful lives of many marks.

There is less inter-class variation in survival estimates among the other Nice service classes in Figure 4. Service marks registered in class 37 (building construction & repair), 39 (transportation and storage), and 40 (treatment of materials) appear more likely to survive M6, R10, and R20. While, with the exception of class 38, registrations in class 35 (advertising and business) have the lowest expected survival estimates. Still, the difference in estimates is small.

- *Marks registered in classes for use on firearms, musical instruments, raw materials, and durable goods show longevity while those used on toys and sporting goods are the shortest-lived.*

Figure 5 presents survival estimates by Nice goods class and for goods certification marks. Higher survival estimates for marks used on firearms, musical instruments, and even paints are not surprising given the established and enduring markets for such goods. They are likewise characterized by lengthy product life cycles, relatively slow changes in

³⁰ Survival estimates suggest that the new classes have higher maintenance rates though only a small subset issued prior to 2006 have been at hazard of cancellation for failure to establish use in the sixth year of registration.

³¹ See Haltiwanger et al. (2013).

³² [See Schumpeter]

technology, and consumer premiums on mature, established products or brands. Class 13 (firearms) registrations, in particular, show considerable longevity as more than 40 percent are estimated to survive R20. Other classes with relative higher survival estimates appear to cover various raw materials and durable goods, though each class includes consumer products (e.g. class 7 (machinery) includes vacuum cleaners). Still, this result points to higher survival of marks used by upstream entities and suggests potential differences in branding strategies within supply chains.

Classes with the lowest registration survival estimates – 28 (toys and sporting goods), 32 (light beverages), 25 (clothing), 26 (fancy goods) – consist predominantly of consumer goods. On the low end of the survival spectrum, and somewhat of an outlier, is class 28. Less than 40 percent of class 28 registrations are estimated to survive M6 and roughly 20 percent to outlive R20. A case can be made that consumer goods falling in class 28 (“*[g]ames and playthings; gymnastic and sporting articles...*”³³) are characterized by brief product life cycles and volatile consumer preferences. Such characteristics likely render building brand equity difficult and, accordingly, abbreviate the lives of most trademarks in those product markets.

5.3 Incumbent versus novel marks

Figure 6 presents class survival estimates at M6 and relevant renewal events by the following legal bases at filing: use of the mark in commerce (“use”); intent to use the mark in commerce (“intent-to-use” or “intended use”); a prior application or registration of the mark in a foreign jurisdiction (“foreign priority”); and a prior international registration (“international registration”).³⁴

- *Registered classes for “incumbent” marks already deployed in U.S. markets outlive those of novel marks filed based on intended use or foreign priority.*

Prior to 1989, use in commerce was required upon filing for registration (with one exception that we discuss below).³⁵ Launched in that year, intent-to-use applications permit applicants to file based on a bona fide intent to use the mark in commerce but require use be established before a registration is issued.³⁶ Marks registered by way of an

³³ Nice class 28 explanatory note, *see* TMEP §1401.02(a).

³⁴ For background on legal bases for filing, *see* Case Files §4.1.3. While applicants must state a legal basis for filing for each class, the Case Files dataset only captures these data at the application level and provides no means to link bases to individual classes.

³⁵ To apply for registration with the USPTO, an applicant must state a legal basis for filing for each class. To file under the use basis, the owner must submit a declaration stating that, as of the filing date, the mark is used in commerce that Congress can regulate, i.e., interstate commerce or commerce between the United States and foreign nations. *See* Case Files §4.1.3.

³⁶ Intent-to-use applications were introduced per the Trademark Law Revision Act of 1988 and implemented on November 16, 1989. 15 U.S.C §1051(b). Generally, the applicant’s sworn statement is sufficient evidence of good faith unless

intent-to-use application can be viewed as original marks newly introduced in the market for the identified goods and services, whereas those registered based on use denote mature marks already deployed in that product market. Thus, we can explore the value of new marks against that of mature counterparts by comparing the survival distributions of intent-to-use versus use classes in Figure 6. Not surprisingly, a considerably larger proportion of use T10 classes are expected to survive M6, R10, and R20 than intent-to-use T10 classes. We expect established marks to have higher brand identification and association value, and thus greater registration longevity, than novel marks with little to no consumer awareness prior to issuance. Likewise, a higher degree of volatility and experimentation associated with new marks may contribute to the relative brevity of intent-to-use registrations.

The survival of classes filed based on foreign priority or an international registration is particularly noteworthy because the use requirement does not initially apply. The U.S. trademark system allows for registration on the basis of a prior registration in a foreign jurisdiction under the Paris Convention³⁷ and an international registration under the Madrid Protocol.³⁸ Such mark owners must declare a bona fide intent to use the mark in U.S. commerce, but the mark is registrable without establishing actual use.³⁹ Registrants need only establish use at M6 or beforehand if the registration is challenged in an *inter-partes* proceeding.⁴⁰

- *Classes registered based on foreign priority consistently have the lowest survival estimates while those registered based on an international registration have the highest estimated M6 survival.*

Figure 6 suggests that only about one-third percent of foreign priority T10 classes survive M6, compared to over half of use and international registration T10 classes. Given that marks registered based on foreign priority and international registration are new entrants into U.S. markets, we might expect them to have comparable survival rates to prototype

evidence clearly indicates that the applicant does not have a bona fide intention to use the mark in commerce. An applicant filing based on intended use cannot obtain registration until i) the mark is actually used in commerce; ii) a verified statement or declaration to that effect is filed; and iii) a specimen of use is submitted. If an applicant fails to establish use prior to or within 36 months of being issued a Notice of Allowance, the application for registration is treated as abandoned. 37 C.F.R. §2.76(a). *See* Case Files §4.1.3.

³⁷ 15 U.S.C. §1126. For background on requirements for filing and registering an application filed based on a prior application or registration in a foreign jurisdiction under the Paris Convention, *see* TMEP §1000.

³⁸ For background on requirements for filing and registering an application filed based on an international registration under the Madrid Protocol, *see* TMEP §1900.

³⁹ Note an applicant can only use a foreign application as a basis for filing and to establish a priority filing date. Before the mark can be published for opposition, the applicant must assert use or intended use in U.S. commerce as its basis for publication or rely on a registration from its country of origin as its basis for registration in the United States. 37 C.F.R. §2.34(a)(4)(iii). *See* TMEP §1002.

⁴⁰ [cite relevant TMEP sections]

marks filed on intended use. Instead, M6 survival of international registration T10 classes is comparable to use counterparts; whereas foreign priority T10 classes have significantly lower M6, R10, and R20 survival estimates relative to intent-to-use counterparts.

We believe these divergent tendencies reflect selection into the Madrid system. Brand owners are more likely to seek international registration for marks that are widely deployed and/or they anticipate extending further in the global market. Thus, marks entering the U.S. system via the Madrid system are likely to be among the more valuable and exhibit relatively higher maintenance and renewal outcomes. While Figure 6 provides some support theory, because the U.S. only started accepting filings based on international registration in late 2002, we observe only M6 survival and only for relatively few classes filed based on international registration (see Table 2).

That foreign priority classes consistently have the lower survival estimates may suggest that foreign marks have an inherent disadvantage in U.S. markets relative to mature marks already in use as well as novel counterparts of domestic origin. We consider this particular hypothesis further in Section 5.4.1. Selection into intent-to-use filings may also play a part. We expect foreign applicants to favor intent-to-use over foreign priority filings for strategic purposes. Given the comparatively low trademark filing fees in the U.S., foreign applicants may file intent-to-use applications for potential marks to establishing priority at relatively low cost.⁴¹ Filing multiple applications within a home jurisdiction to enable foreign priority filing in the U.S. may entail greater investment and loss should applicants opt not to pursue registration. Such strategic filing behavior is particularly appealing to applicants seeking to register marks that require additional regulatory approval, such as those used on new pharmaceutical drugs, so as to hedge against the risk of refusal.⁴²

5.4 Origin

Section 5.3 highlights the potential differences between domestic and foreign applicant behavior and the value of novel versus incumbent marks they register. In this section, we explore these dynamics further by comparing registered class survival by origin, with and without controlling for legal basis at filing. Figure 7 depicts class survival estimates by the address of the first-named owner or, where the address field was unpopulated, the first-named owner's nationality.⁴³ We limit the plot to the five countries accounting for the largest shares of foreign classes as well as China. We include China so as to compare marks originating in established western economies with those from a rapidly advancing

⁴¹ [priority of use established at filing for intent-to-use applications; current filing fees]

⁴² [reference TMEP section on marks for medical drugs/treatments]

⁴³ [foreign priority established based on address]

economy. The five countries together account for roughly 59 percent of the foreign-owned classes in our sample.

Unsurprisingly, our sample contains few Chinese-owned classes, particularly T20 classes. Still, despite imprecise estimates, Figure 7 suggests relatively high maintenance and renewal rates for Chinese-owned classes. By contrast, survival estimates indicate that French-owned classes have the lowest maintenance and renewal rates relative to domestic- and other foreign-owned classes. It is somewhat surprising that, with the exception of Chinese- and Japanese-owned classes (and German- and U.K.-owned T20 classes), foreign-owned classes tend to have significantly lower survival estimates than U.S.-owned classes. We would expect foreign owners to extend more valuable marks and brands to U.S. markets and this selection to result in higher maintenance and renewal rates compared to U.S. registrations. As we touched on in Section 5.3, foreign applicants may pursue U.S. registration using different legal bases for various strategic purposes and based on the maturity (or novelty) of marks. Survival estimates aggregated at the country-level may not be capturing these nuances.

5.4.1 Origin controlling for legal basis

In Figure 8, we present M6 survival estimates by origin for T10 classes, controlling for legal basis at filing. Again, we consider marks filed based on use as incumbent marks already deployed in U.S. markets and those filed based on intent-to-use, foreign priority, or international registration as novel marks yet to be introduced in U.S. markets.

- *Registered classes for foreign-owned marks deployed in U.S. markets exhibit higher M6 survival than U.S.-owned counterparts, consistent with selection.*

Across countries, the M6 survival estimate for foreign-owned use classes is significantly higher than that of U.S.-owned use classes (represented by the solid line in Figure 8). This is more consistent with our assumption of selection, i.e. foreign marks in use in U.S. commerce are likely to be more widely deployed in global markets and, thus, more valuable than U.S.-owned marks used in domestic markets alone.

Turning to novel marks, Figure 8 shows M6 survival estimates for foreign-owned intent-to-use classes above and below that of U.S.-owned use and intent-to-use classes (indicated by the dashed line). This ambiguous result suggests that foreign novel marks do not necessarily have an inherent disadvantage in U.S. markets relative to domestic marks already in use or even novel counterparts of domestic origin. Figure 8 does provide some support for foreign applicant selection into intent-to-use and international registration filings over the foreign priority option.

- *For all foreign origins, except China, marks already in use are expected to outlive marks newly or yet to launch in U.S. markets.*

For all countries in Figure 8, except China, registrations filed based on use have higher M6 survival than those filed based on intended use. This result supports the hypothesis of incumbent advantage whether marks originate from the U.S. or abroad. Registrations issued to Chinese mark owners are the apparent exception to this incumbent advantage. While estimates are imprecise, Figure 8 indicates M6 survival does not differ significantly by legal basis at filing for Chinese-owned classes. Thus, Chinese marks established in U.S. markets do not appear to have an advantage over Chinese marks registered abroad and newly introduced in the United States. Still, this may be because Chinese brands are rare and relatively young in U.S. markets, having yet to achieve an incumbent advantage similar to that of longstanding marks originating in western economies.

5.5 Design

Registered marks take different forms, from a simple firm or product name with no stylized font or design elements to pure design marks with no words and even nonvisual marks consisting of sounds or a scent. Brand owners presumably deploy these distinct devices for different purposes. We expect pure design marks (lacking words) and nonvisual marks to generally be brand association marks, serving to establish and/or strengthen brand loyalty; whereas standard character (pure word) marks typically serve as brand or product identifiers. However, standard character marks afford owners considerable flexibility and broader protection because the owner's trademark rights reside in the wording itself regardless of how terms appear on or in connection with goods and services.⁴⁴ By contrast, owners have little to no flexibility in how they display other identifying marks like logos (words and designs) and stylized word marks (in a particular font, size, and/or color) while still preserving trademark rights. This is because owners can only claim rights in a logo or stylized mark as a whole, not the individual elements therein. Thus, within the subset of brand identifying marks, we expect standard character marks to be the most valuable but still afford less value to brand owners than brand association marks. To further examine the dynamics between mark forms and value, in Figure 9, we present class survival estimates at maintenance and renewal events across mark design categories.

⁴⁴ See *In re Viterra*, 671 F.3d 1358, 1363 (Fed. Cir. 2012); 37 C.F.R. §2.52(a).

- *Registered classes for brand association marks, particularly pure design marks, have significantly higher survival estimates at maintenance and renewal relative to those for brand identifying marks (standard character and design and character logos).*

Figure 9 shows significantly higher M6, R10, and R20 survival estimates for T10 classes registered for pure design marks relative to those for standard character, stylized character, and design and character logos. However, the differences between estimates are not very large, possibly indicating that the value derived from brand association marks is not much larger than that derived from identifying marks. Brand owners may also experiment more with brand association marks, abbreviating their useful lives relative to brand or product identifiers. Additionally, because word marks may consist of brand association slogans, the difference in survival estimates between pure design and word marks is a noisy indicator of the value differential between association and identifying marks.

By compelling a unique sensory response among consumers, nonvisual marks may prompt stronger and more complex brand associations. However, nonvisual marks are very rare in our sample (see Table 2), rendering survival estimation less precise. While point estimates for nonvisual marks are generally the highest, the wide confidence bands in Figure 9 indicate that nonvisual mark class survival is not significantly different from that of other mark forms.

The longevity of design marks is telling of their value as brand association marks but also of the strength of the overall brand. This is because the brand had to acquire sufficient reputational value for consumers to recognize a pure image without any reference to brand name. Thus, because the strength of association marks is conditional on consumer awareness, it is difficult to isolate their individual value from the brand value created by prior identification and association marks already deployed in the market.

5.6 Prior mark claims

Section 5.5 introduces the idea of mark brand equity being dependent on that of senior marks of the same brand. A unique feature of the *Case Files* dataset enables us to further explore variation in the value of marks within a brand portfolio. To help examining attorneys identify applicant-owned registrations that would otherwise block registration during relative ground examination, applicants may claim ownership of prior, senior registrations for the same or similar marks.⁴⁵ Any claimed prior marks are captured in the

⁴⁵ A mark owner cannot add new goods or services (whether in the same or different Nice classes) to an existing registration. To expand protection of a mark for use on other products, the entity must register the same or a similar mark identifying the additional goods or services. *See* Case Files §4.1.2.2. Applicants may list senior registrations or pending application (with an earlier priority date) for the same or similar marks in the application. *See* 37 CFR §2.36; Case Files §4.1.4.1; TMEP §812.

Case Files dataset and can be used to link related registrations. A note of caution, however, is in order. Applicants are not required to list prior registrations upon filing and, accordingly, there is a possibility of selection bias in survival estimates based on prior mark claims. A claim may be an indication of value of the claimed or claiming registration as well as learned behavior by applicants seeking to streamline examination.

With this potential bias in mind, we plot class survival estimates by the incidence of senior or junior mark claims in Figure 10. Specifically, we identify each registration as claiming a senior mark and/or being claimed by a junior mark. For now, we consider only the incidence of claiming or being claimed, disregarding the frequency of such claims or the length of backward and forward claim lags. We label the senior registration that is only claimed by junior marks as the “founder” as it is the initial registration for a portfolio of similar marks. We refer to junior registrations that claim a senior registration as “descendants” because they derive from the founder or another descendant that claimed the founder.

- *Senior claimed by marks show significantly higher survivability whether founding or subsequent registered class in brand portfolio.*

Figure 10 suggests that founding registered classes have considerably higher survival rates. However, descendants that claim a senior registration and are also claimed by junior registrations appear to have comparable or higher survival rates than founders. This suggests that registration longevity may not depend on the mark being the first in a brand portfolio but being sufficiently valuable to extend use to additional goods and services or with different design elements. Expanding use of the same or substantially similar mark may signal strategic behavior by owners for such purposes as creating licensing opportunities, intensifying consumer associations and confidence in a brand, or easing entry into new product marks by leveraging consumer brand associations (Schlicher, 1996; Krasnikov et al., 2009). Survivorship bias also may contribute to this result as those registrations surviving maintenance and renewal events have greater opportunity to be claimed in junior applications.

Descendants that are not claimed by a subsequent junior registration have yet to precipitate expanded use. We would expect such marks to be relatively less valuable to brand owners and, thus, exhibit lower survivability. Indeed, Figure 10 indicates significantly lower maintenance and renewal event survival for classes that only claim senior marks. Still, descendants are more likely to survive events than classes that cite no senior marks, suggesting that more value is derived from marks within a brand portfolio than in isolation.

6 Parametric Evidence

Graphical evidence indicates significant differences in class maintenance and renewal event survival across multiple observable class and mark characteristics. To examine the relative importance of these characteristics, we adopt two parametric approaches. First we examine binary outcomes at each maintenance and renewal event. Second we use parametric survival analysis to estimate survival distributions over the life of registered classes. Again, survival analysis is appropriate because class lives, as well as certain explanatory variables, are right censored.

For independent variables, we use the following categorical variables discussed in Section 5: mark type, Nice classification, legal basis at filing, origin, mark design form, and prior mark claims. We also construct additional variables from the *Case Files* dataset.

Applicants typically record with USPTO the date the applied for mark was first used in commerce.⁴⁶ The first use date generally falls prior to filing date for use applications and after filing date for intent-to-use and foreign priority applications. Thus, we use the duration from this first use date to registration date to capture the mark’s time in use at registration and better identify the impact of incumbency (or novelty) on class maintenance and renewal.

Since prior mark claims require common ownership, we can employ the *Case Files* data on claiming and claimed registrations to identify “family” relationships between marks. For instance, junior registrations that claim the same founding registration are deemed related “children” of the founder. Subsequent junior registrations that claim a child are “grandchildren”, and so on. Replicating the method used in Graham et al. (2013), we construct trademark “families” of related registrations using all possible links, or set of intervening registrations, in the *Case Files* dataset.⁴⁷ Because prior registrations claims are not mandatory nor necessarily verified during examination, this method does not perfectly identify all marks in every possible trademark family. Nevertheless, it provides a means of grouping related registrations without introducing the complexity of owner name disambiguation. Based on the families identified for the entire *Case Files* dataset, we construct a set of variables to capture whether a mark is part of a brand, the value of that brand when the mark enters, and the value of the mark within the brand.

⁴⁶ [First use in commerce dates are not always provided.]

⁴⁷ For example, if registration G claims prior registrations E and F, and registration E claims registrations B and C, the network would include registrations B, C, E, F, and G. If registration B claims registration A, the network would include registrations A, B, C, E, F, and G.

To capture overall brand value we use the size and age of the trademark family when the class entered. We calculate family size at entry as the number of registrations that had claimed the family founder or a senior descendent (whether in our sample or not) within the family prior to the class's registration date. The family size at entry will be zero for founders as well as registration not claiming any senior registrations (i.e. those not in a family). We calculate family age at entry as the duration between the registration date of the founding member (whether in our sample or not) and the class's registration date.

To capture within brand value, we construct three dummy variables to indicate whether the class is the family founder, claimed any senior mark, or was claimed by any junior mark. We expect those classes claiming seniors to be relatively less valuable than family founders as well as classes claimed by juniors. We also use the number of senior marks claimed and the number of claims by junior marks to more precisely capture relative value within brand. We expect classes that claim many senior marks to be less valuable within a brand; whereas those that are claimed by many junior marks to be relatively more important. Because the incidence and number of claims by junior marks are time-variant and right censored, in binary analysis, we calculate founder and claimed by junior dummy variables and the number of claims by junior marks as of the maintenance or renewal event.

The main variables used in parametric analysis are as follows (see Table 2 for summary statistics):

LegalBasis: a categorical variable indicating the legal basis at filing, using use classes as the base.

Time_In_Use: duration (in years) from date of first use in commerce to registration date.

Design: a categorical variable indicating the mark design form, using standard character marks as the base.

InFamily: a dummy variable equal to 1 if the class is claims a senior mark at registration or is claimed by a junior mark as of a designated event date.

FamilyFounder: a dummy variable equal to 1 if the class is only claimed by junior marks in the same family as of a designated event date.

FamilySizeEntry: number of senior mark registrations (whether in sample or not) in family as of class registration date.

FamilyAgeEntry: age of family, based on registration date of family founder (whether in sample or not), as of class registration date.

ClaimsSenior: a dummy variable equal to 1 if the class owner claimed a senior mark registration at filing.

NoSeniorClaims: number of senior mark registrations claimed at filing.

ClaimByJunior: a dummy variable equal to 1 if class was claimed as a related prior mark by a junior registration as of a designated event date.

NoJuniorClaims: number of junior mark registrations claiming class as of a designated event date.

MarkType: a categorical variable indicating the mark type, using goods marks as the base.

USAddr: a dummy variable equal to 1 if the first-named owner of class has a U.S. address.

[variables to capture product and/or registrant turnover]

6.1 Binary

To examine the outcome of individual maintenance and renewal events, we estimate a probit model of the probability of class c being maintained, conditional on class survival to the event, as a function of a vector of class characteristics X :

$$[\Pr(\text{Maintained} = 1|X) = \Phi(X'\beta)]$$

Because most registered class deaths occur at M6, we focus binary analysis on a model of M6 outcomes. Table 3 examines the relationship between the probability of maintenance at M6 and class characteristics. We begin in column (1) by using only categorical variables. Estimated marginal effects generally support the results of graphical analysis (in Section 5) related to legal basis at filing, mark design form, mark type and domestic versus foreign origin. Adding *Time_In_Use* to the model in column (2), estimated marginal effects remain largely unchanged except for *LegalBasis*. Controlling for mark time in use, intent-to-using filings are associated with a significantly higher probability of M6 maintenance relative to use applications, though the magnitude is small. Time in use appears to have a large impact on class maintenance, consistent with mature marks having an incumbent advantage over novel marks.

In columns (3) and (4), we add brand-related variables but again omit *Time_In_Use*. Column (3) examines the relationship between maintenance and being in a brand, accounting for variation in the age and size of that brand at entry. Estimated marginal effects on categorical variables are largely similar to those in column (1). Again, results are consistent with those of graphical analysis. Being in a trademark family is associated with significantly higher probability of maintenance, though the estimated marginal effect indicates a very low effect. Being in a family and the founder appears to have a much larger effect. Consistent with expectations, entering larger families is associated with lower probability of maintenance but entering older families is associated with higher maintenance. In column (4), we add the prior mark claim variables to capture the

marks value within the brand. Including brand variables and *Time_In_Use*, in column (5), mark time in use continued to have the largest impact on the probability of M6 maintenance.

6.2 Parametric Survival

7 Conclusions and implications

Our objective in this paper is to stimulate further inquiry in noteworthy areas regarding trademark value, longevity, and relationship between renewal outcomes and innovation, competition, and branding. We employ nonparametric survival analysis to highlight significant differences in survival curve distributions across key trademark characteristics. Results indicate a die or thrive dynamic whereby registrations face a high risk of death during the initial years of registration, particularly at sixth-year maintenance, but those that survive the first renewal event are likely to be continuously renewed. This is consistent with our anticipation of a highly skewed value distribution for trademarks. The volatility that new registrations face points to high product-, firm-, and mark-turnover expected in competitive markets. The longevity of registrations surviving this initial period is consistent with healthy market dynamics but also suggests that the most valuable trademarks may serve to secure market power.

One implication of the die or thrive dynamic is unused marks remaining as “deadwood” or “clutter” on the register. From an administrative perspective, the existence of deadwood on the federal register may have considerable policy implications. Unused marks can impose private and social costs by restricting the terms (and other eligible subject matter) available for trademark protection within a product space. Yet, third-party cancellation proceedings provide a means to clear unused marks from the register. This is an area warranting further inquiry, particularly the extent to which unused marks remain on the register, the degree to which such marks impose private and social costs by crowding available naming space, and the optimal timing of maintenance to minimize such costs.

8 Tables and Figures

Table 1: Registered class frequency by observable categories

	Frequency	Proportion
Renewal Term Regime		
Ten-year term (T10)	1,878,171	0.773
Twenty-year term (T20)	550,842	0.227
Mark Type		
Goods	1,505,899	0.620
Services	690,084	0.284
Collective (goods, services, membership)	3,454	0.001
Certification (goods, services)	2,688	0.001
Legal Basis at Filing		
Use	1,544,034	0.636
Intent-to-Use	625,838	0.258
Foreign Application/Registration	100,101	0.041
International Registration	20,289	0.008
Origin (first-named owner address)		
U.S.	2,005,463	0.826
Germany	66,391	0.027
Canada	58,175	0.024
France	44,652	0.018
U.K.	44,528	0.018
Japan	34,493	0.014
China	3,647	0.002
Other non-U.S.	171,664	0.071
Mark Design Form		
Standard Character	1,627,263	0.670
Design & Character	518,926	0.214
Stylized Character	169,328	0.070
Design	113,313	0.047
Nonvisual	168	0.000
Prior Mark Claims		
Claimed by Junior (Founder)	315,688	0.130
Claims Senior	220,194	0.091
Claims Senior & Claimed by Junior	202,608	0.083
None	1,690,523	0.696

Notes. Sample of 2,429,013 classes registered for period 1977-2006. Data coverage varies across variables.

Table 2: Summary Statistics

	Mean	Std. dev.	Min	Max
Maintained_M6	0.492	0.500	0	1
Maintained_R10	0.206	0.404	0	1
Maintained_R20	0.086	0.281	0	1
Maintained_R30	0.018	0.131	0	1
Time_In_Use	4.656	8.067	-13.77	226.24
InFamily_M6	0.265	0.441	0	1
InFamily_R10	0.286	0.452	0	1
InFamily_R20	0.301	0.459	0	1
InFamily_R30	0.304	0.460	0	1
FamilyFounder_M6	0.057	0.232	0	1
FamilyFounder_R10	0.072	0.258	0	1
FamilyFounder_R20	0.083	0.275	0	1
FamilyFounder_R30	0.085	0.278	0	1
FamilySizeEntry	5.485	38.504	0	1049
FamilyAgeEntry	5.298	16.977	0	135.78
ClaimsSenior	0.174	0.379	0	1
NoSeniorClaims	0.392	1.381	0	121
ClaimByJunior_M6	0.157	0.364	0	1
ClaimByJunior_R10	0.188	0.391	0	1
ClaimByJunior_R20	0.209	0.407	0	1
ClaimByJunior_R30	0.213	0.409	0	1
NoJuniorClaims_M6	0.379	1.904	0	316
NoJuniorClaims_R10	0.503	2.411	0	421
NoJuniorClaims_R20	0.633	2.917	0	563
NoJuniorClaims_R30	0.668	3.116	0	563
USAddr	0.826	0.380	0	1

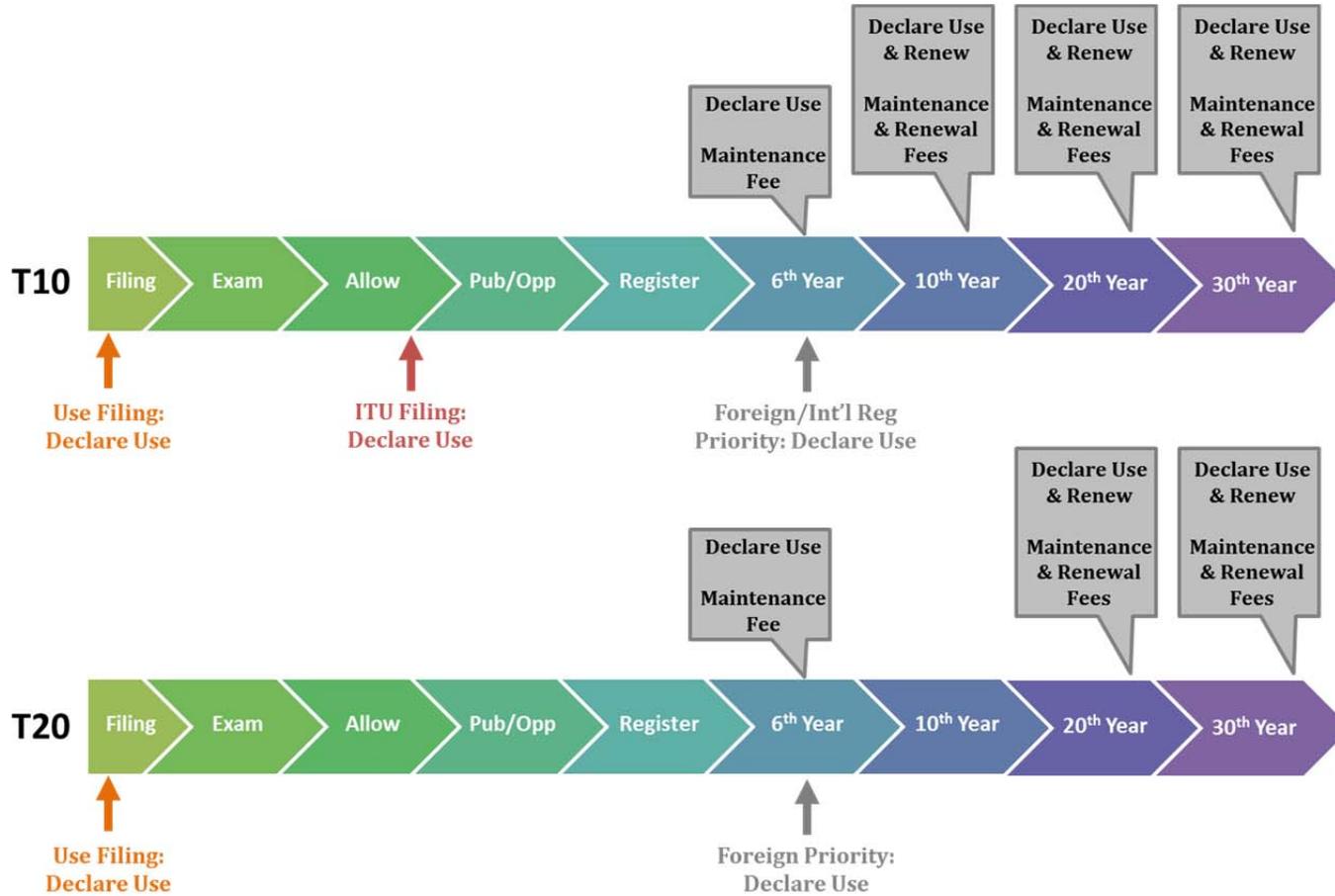
Notes. Sample of 2,402,906 classes registered for period 1977-2006. Data coverage varies across variables. Maintained_* = 1 if class maintained at event, allowing for a 1 year lag in recordation of cancellation. Time_In_Use = duration (in years) from date of first use in commerce to registration date, exclude outliers resulting from dates recorded in error. InFamily_* = 1 if class claims a senior mark at registration or is claimed by a junior mark as of event. FamilyFounder_* = 1 if oldest class (based on registration date and serial number sequence) in Family as of event. FamilySizeEntry = number of senior marks in Family as of class registration date. FamilyAgeEntry = age of Family, based on registration date of FamilyFounder, as of class registration date. FamilySizeEntry and FamilyAgeEntry exclude one outlier family of over 8,000 classes that appears to be the result of false positive family links. ClaimsSenior = 1 if owner of class claimed senior related prior mark at registration. NoSeniorClaims = number of senior classes claimed at registration. ClaimByJunior_* = 1 if class was claimed as a related prior mark by a junior class as of event. NoJuniorClaims_* = number of junior claims as of event. UsAddr = 1 if first-named owner of class has U.S. address.

Table 3: Impact of characteristics on M6 maintenance

Dependent variable	(1) Maintained	(2) Maintained	(3) Maintained	(4) Maintained	(5) Maintained
LegalBasis (base=use)					
Intent-to-use	-0.022 *** (0.001)	0.050 *** (0.001)	-0.021 *** (0.001)	-0.024 *** (0.001)	0.041 *** (0.001)
Foreign app/reg	-0.164 *** (0.002)	-0.095 *** (0.023)	-0.159 *** (0.002)	-0.160 *** (0.002)	-0.089 *** (0.023)
Intl reg	0.092 *** (0.004)		0.093 *** (0.004)	0.092 *** (0.004)	
log(Time_In_Use)		0.149 *** (0.001)			0.137 *** (0.001)
Design (base=standard char)					
Logo (design & char)	-0.036 *** (0.001)	-0.037 *** (0.001)	-0.048 *** (0.001)	-0.048 *** (0.001)	-0.049 *** (0.001)
Stylized characters	-0.014 *** (0.001)	-0.019 *** (0.001)	-0.021 *** (0.001)	-0.022 *** (0.001)	-0.025 *** (0.001)
Design	0.022 *** (0.002)	0.007 *** (0.002)	0.024 *** (0.002)	0.025 *** (0.002)	0.011 *** (0.002)
Nonvisual	0.076 ** (0.038)	0.033 (0.041)	0.084 **	0.084 ** (0.037)	0.040 (0.041)
InFamily_M6			0.063 *** (0.002)		
FamilyFounder_M6			0.085 *** (0.002)	0.069 *** (0.002)	0.065 *** (0.002)
log(FamilySizeEntry)			-0.010 *** (0.000)	-0.013 *** (0.000)	-0.009 *** (0.000)
log(FamilyAgeEntry)			0.024 *** (0.000)	0.031 *** (0.000)	0.024 *** (0.000)
ClaimsSenior				0.010 *** (0.002)	-0.002 (0.002)
log(NoSeniorClaims)				-0.002 *** (0.000)	-0.002 *** (0.000)
ClaimByJunior_M6				0.027 *** (0.002)	0.029 *** (0.002)
log(NoJuniorClaims_M6)				0.009 *** (0.000)	0.010 *** (0.000)
MarkType (base=goods)					
Service	-0.021 *** (0.001)	-0.028 *** (0.001)	-0.015 *** (0.001)	-0.016 *** (0.001)	-0.023 *** (0.001)
Certification/Collective	0.162 *** (0.006)	0.104 *** (0.007)	0.155 *** (0.006)	0.156 *** (0.006)	0.102 *** (0.007)
USAddr	-0.031 *** (0.001)	-0.027 *** (0.001)	-0.029 *** (0.001)	-0.029 *** (0.001)	-0.027 *** (0.001)
Reg. year effects	No	No	No	No	No
Nice class effects	No	No	No	No	No
Registered classes	2,402,906	2,099,308	2,402,906	2,402,906	2,099,308

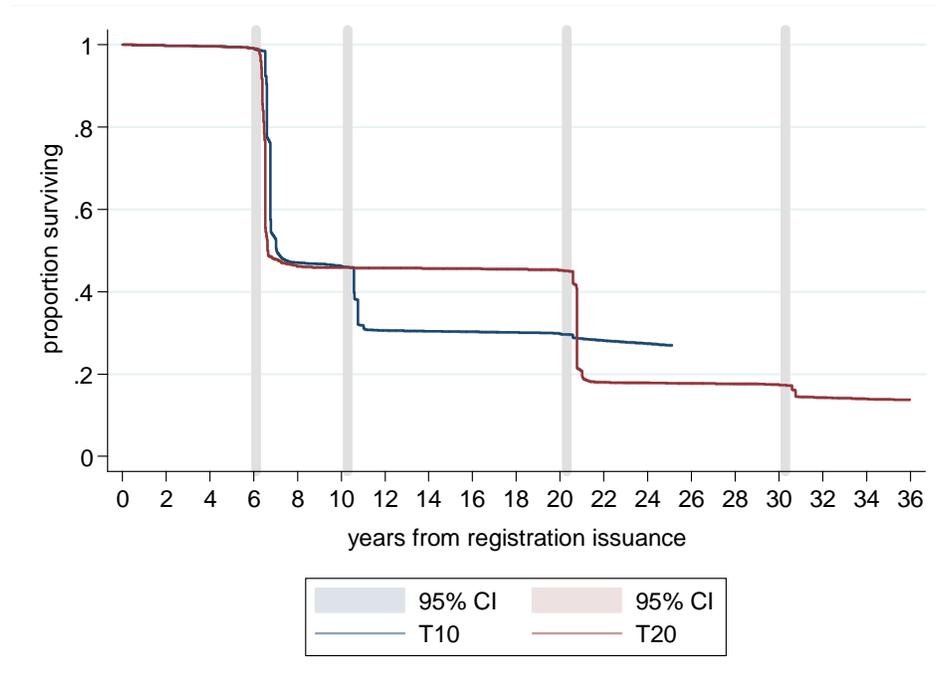
Notes. * significant at 10%, ** significant at 5%, *** significant at 1%. Robust standard errors are reported in parentheses. Maintained= 1 if class maintained at M6, allowing for a 1 year lag in recordation of cancellation. Time_In_Use= duration (in years) from date of first use in commerce to registration date. InFamily_M6=1 if class claims a senior mark at registration or is claimed by a junior mark as of M6. FamilyFounder_M6= 1 if oldest class (based on registration date and serial number sequence) in Family as of M6. FamilySizeEntry= number of senior mark registrations in Family as of class registration date. FamilyAgeEnty= age of Family, based on registration date of FamilyFounder, as of class registration date. ClaimsSenior= 1 if owner of class claimed senior related prior mark at filing NoSeniorClaims= number of senior mark registrations claimed at filing ClaimByJunior_M6= 1 if class was claimed as a related prior mark by a junior registration as of M6. NoJuniorClaims_M6= number of junior mark registrations claiming class as of M6. UsAddr= 1 if first-named owner of class has U.S. address. We add 1 to logged measures to include classes with zero values.

Figure 1: Maintenance and renewal event timeline by renewal regime



The views expressed are those of the individual authors and do not necessarily reflect official positions of the Office of Chief Economist or the U. S. Patent and Trademark Office.

Figure 2: Class survival by renewal term regime



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Figure 3: Class survival by mark type

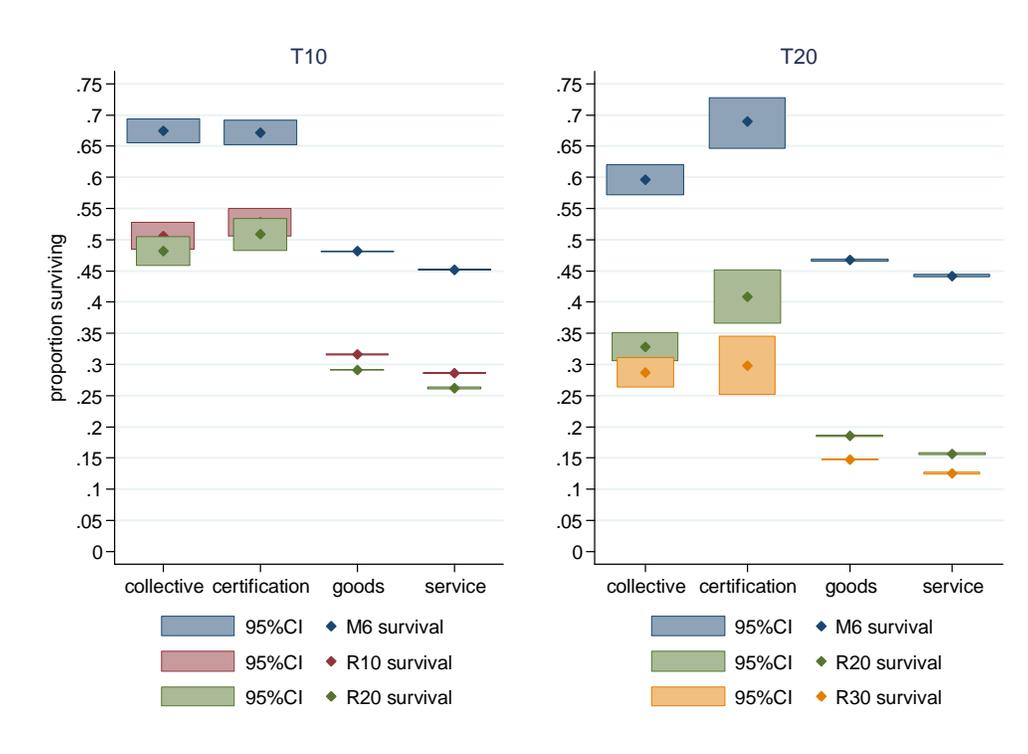


Figure 4: Class survival by Nice service classification

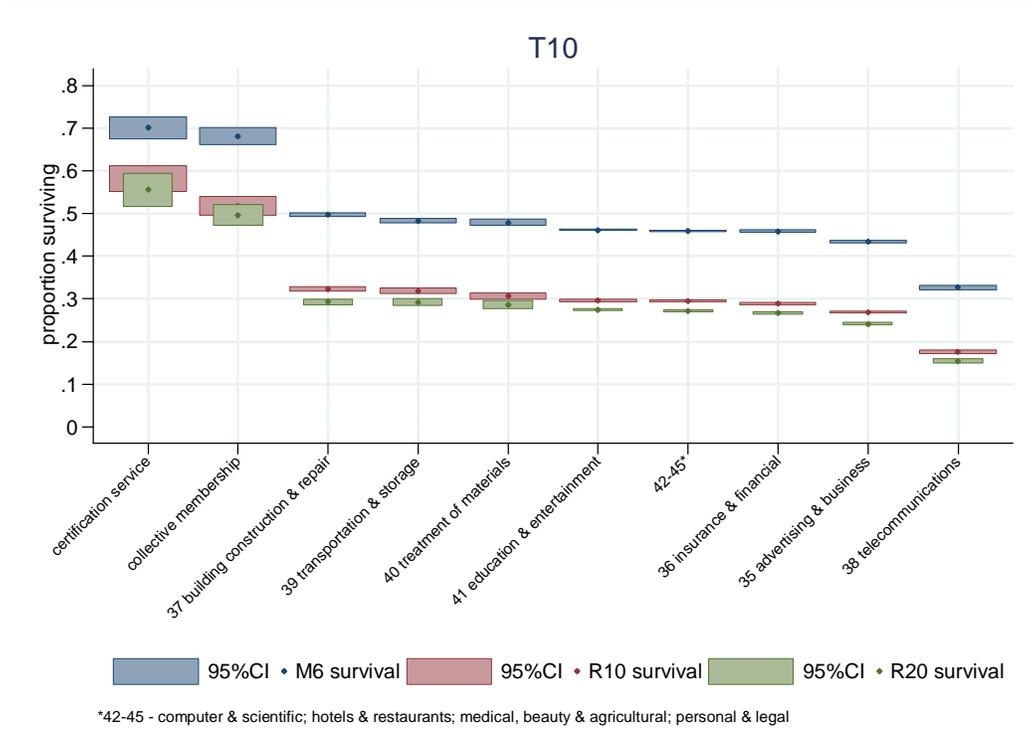


Figure 5: Class survival by Nice goods classification

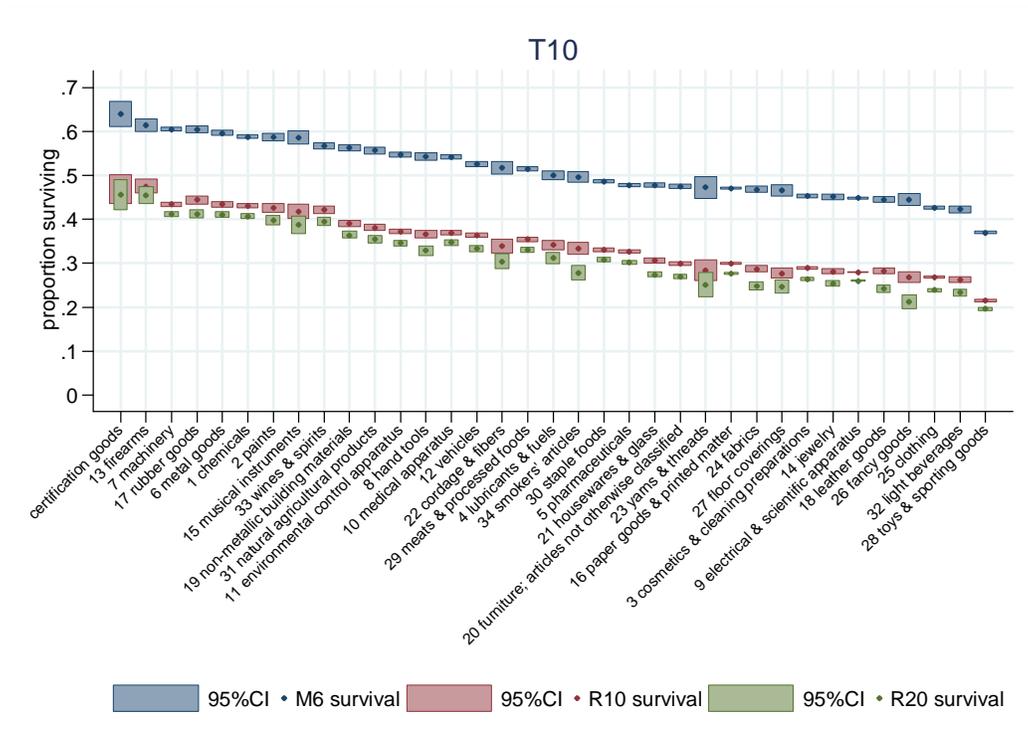


Figure 6: Class survival by legal basis at filing

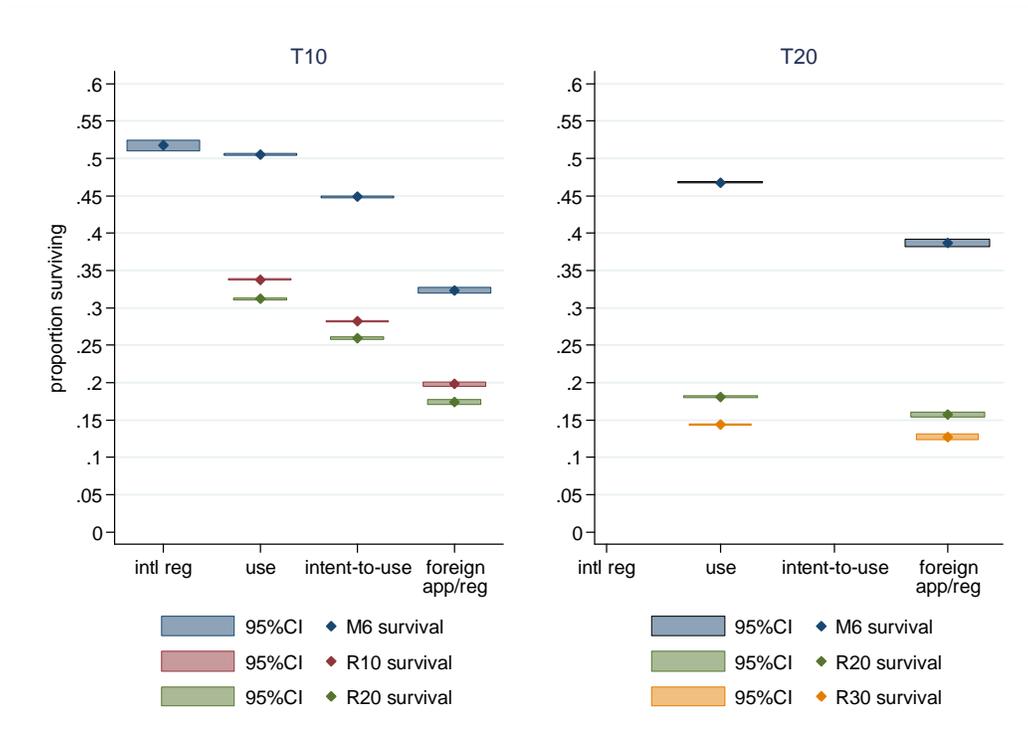


Figure 7: Class survival by owner origin

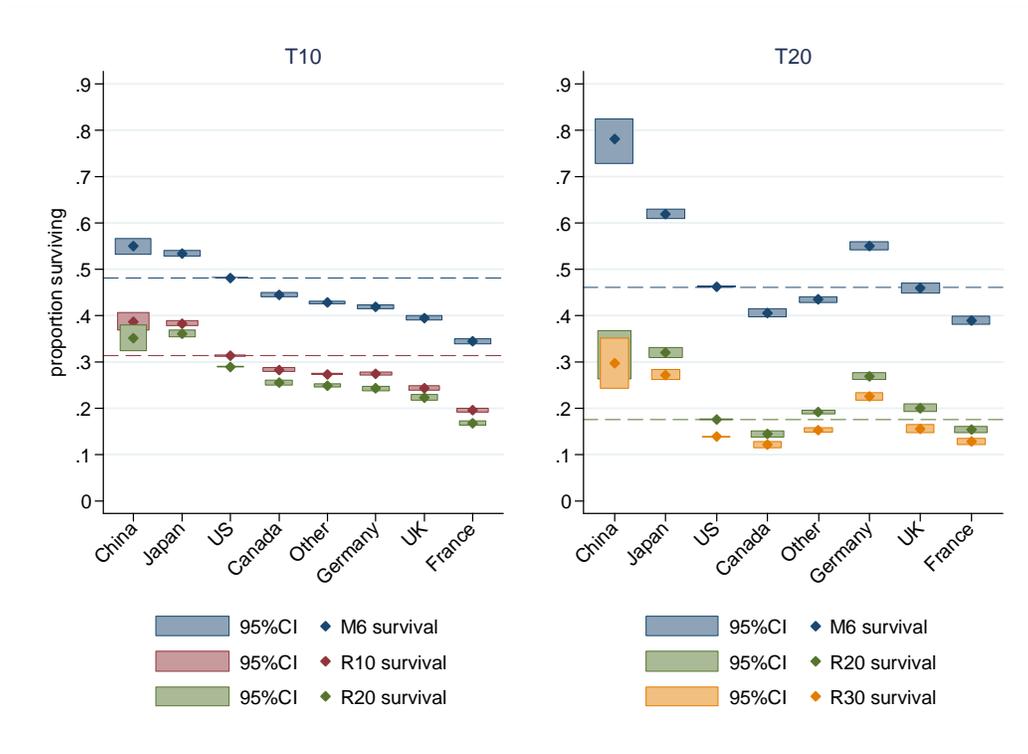


Figure 8: M6 survival for T10 classes by owner origin and legal basis at filing

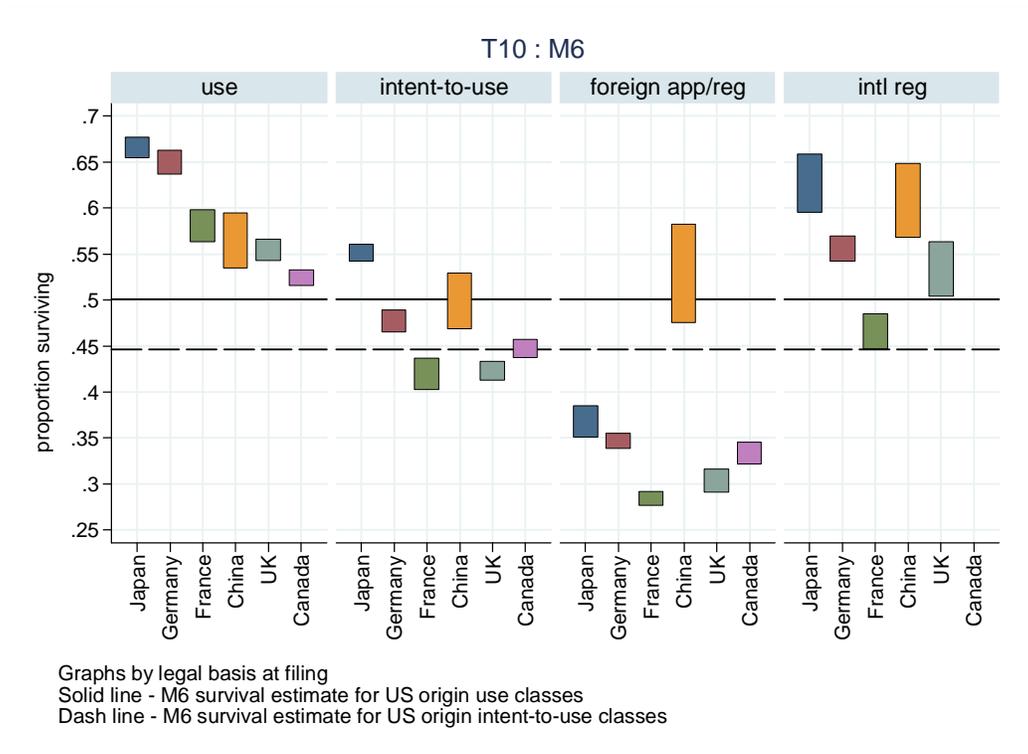


Figure 9: Class survival by mark design

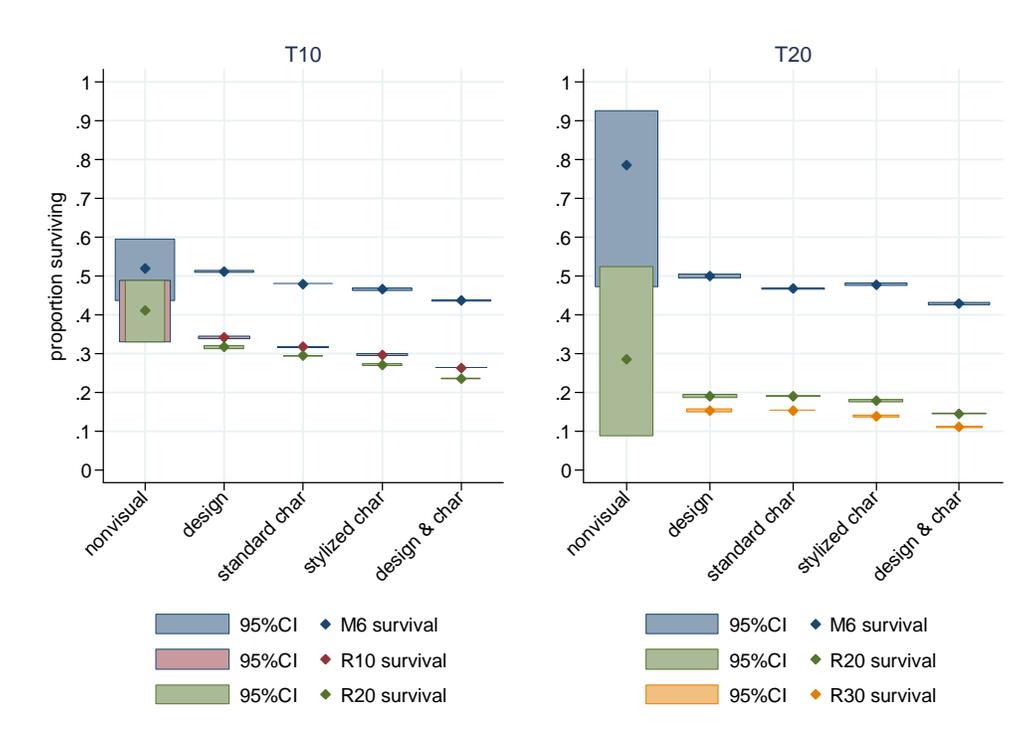


Figure 10: Class survival by prior mark claims

