An Empirical Study of Gender and Race in Trademark Prosecution

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Abstract

This article is the first to empirically analyze how race and gender impact success in filing trademark applications before the United States Patent and Trademark Office. We found that women regularly secure trademark registrations at a higher rate than men, and not all racial minorities are underrepresented in the trademark applicant population. Furthermore, while women and minorities have been underrepresented historically, the disparity is decreasing at a rate not seen in other IP registration systems. Our conclusions reveal that gender and racial representation in trademark prosecution stands in sharp contrast with copyrights and patents where systematic underrepresentation of women and minorities and bias has been well documented.

Our article situates trademark registration as a particularly important measure of entrepreneurial activity and progress of business, education, and the arts. We survey the intellectual property empirical literature documenting that women and minorities register patents and copyrights less frequently than white males. Next, we note that while leading journals have recently published empirical studies that significantly advance our understanding of trademark prosecution, no published studies consider the race and gender of trademark applicants. Our work fills that void. We derived our

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dataset from three decades of United States Patent and Trademark office registration data for individual trademark applicants. We cross-referenced the universe of individual applicants with census data to identify the applicants by race and gender. Based on well documented patterns of gender and racial bias in patent and trademark prosecution, we began our empirical analysis with the theory that one could expect the same pattern to hold when analyzing USPTO trademark data. However, the data showed significant differences from the other two federal IP regimes. Therefore, this article substantially contributes to our understanding of minority intellectual property ownership and a fertile new foundation for further research in intellectual property theory, policy, law, and reform.

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I. Introduction

This article is the first to empirically analyze how race and gender impact success in filing trademark applications before the United States Patent and Trademark Office ("USPTO"). The USPTO has worked to present itself as a federal agency that does not condone racial or gender bias. In the build-up to the 2017 Matal v. Tam decision, it invested substantial resources in fighting to uphold a federal law that permitted the USPTO to reject trademark applications that contained disparaging comments such as racial slur. It fought hard to avoid having to put its seal of approval on such content, and it lost. In the wake of that decision, the USPTO has an even greater incentive to provide registration services in a manner that does not discriminate on the basis of gender and race. This Article is the first to examine USPTO registration data to examine the extent to which gender and race impacts success before the USPTO.

Recent scholarly work has uncovered gender inequities, racial disparity, and bias in patent examination. That research uncovered certain biases against women in patent examination and underrepresentation of women and minority groups in both systems. In this Article, we examine whether these patterns are also reflected in trademark registration data. We theorized that one may expect to see similar patterns. This research tested that theory by empirically examining three decades of trademark registration data for individual applicants and cross-referencing this information with census and other data to identify the applicants by race and gender.

The article proceeds as follows. Part II provides an overview of the trademark registration process to explain why applications are increasing so dramatically as entrepreneurs, arts organizations and sole proprietors seek to launch new ventures. In this section, we discuss why the demand for federal trademark registration is strong and increasing. Part III situates this paper against the landscape of other recent empirical scholarship that explores how race and gender correlate with success in

seeking federal intellectual property protection. Part IV lays out the methodology we used to gather data on trademark registration success and explains how we analyze that data with regard to gender and race.

Part V sets forth our findings. We begin by identifying the respective success of corporate and individual trademark applicants. Next, we uncover the differences in success rates that correlate with gender and racial attributes. The study also explores how these attributes affect success in overcoming oppositions, obtaining publication, and ultimately, registration. Because trademarks may be prosecuted with or without a counsel, we also show the extent to which the assistance of legal counsel is used by various groups and the extent to which the assistance of counsel affects success rates. Our analysis of decades of trademark application data offers important insights into the following questions:

1. Are women and minority groups underrepresented in trademark filings and how have these trends changed over time?
2. Does the gender or race of an applicant correlate with success rates before the USPTO?
3. Does the gender or race of an applicant correlate with the likelihood that their application will be opposed by another trademark owner?

The data showed interesting differences from the patterns of bias and underrepresentation reported in other areas of intellectual property prosecution. Our most significant finding is that women secure trademark registrations at a higher rate than men. The data also reflect interesting nuances with respect to race. Not all racial minorities are underrepresented in the trademark applicant population. Furthermore, while women and minorities have been underrepresented historically, the disparity is decreasing at a rate not seen in other IP registration systems.

II. Trademark Registration

Unlike copyrights and patents which endure for a set term and then enter the public domain, trademarks, if properly tended, may last indefinitely as long as the marks continue to meet the requisite standards for use in commerce and distinctiveness.[2] Trademark owners must take some additional steps, such as periodically certifying continued use, in order to maintain federal registrations.[3] Marks may be licensed[4] or assigned[5] without losing protection. Both federal and state trademark law protect a mark, regardless of registration,[6] against various forms of unfair competition and harm to business reputation. Infringement liability may be asserted to defend against confusingly similar uses in the protected geographical area.[7]

Trademark law recognizes rights established through use even for marks that are not registered. However, U.S. common law trademark owners can significantly expand the geographic scope, protection mechanisms, and economic value of their marks by obtaining federal registration. Federal law defines a trademark as a symbol, such as a word, logo, design, or combination of these

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2 15 U.S.C. § 1064 (2018) (stating when a trademark may be cancelled); *id.* § 1058–59 (laying out the duration and renewal terms that govern federal trademarks); McAirlaids, Inc. v. Kimberly-Clark Corp., 756 F.3d 307, 310 (4th Cir. 2014) (stating that trademark law can provide indefinite protection unlike patent law which provides protection for only a limited period); W.T. Rogers Co. v. Keene, 778 F.2d 334, 337 (7th Cir. 1985) (explaining that, upon certain conditions, trademarks may provide "an indefinite term of protection"); Saratoga Vichy Spring Co. v. Lehman, 625 F.2d 1037, 1043–44 (2d Cir. 1980) (discussing the abandonment of a trademark); King-Seeley Thermos Co. v. Aladdin Indus., 321 F.2d 577, 579 (2d Cir. 1963) (noting that, through the holder's lack of care, the trademark "Thermos" became a generic term and entered the public domain); Bayer Co. v. United Drug Co., 272 F. 505, 510–15 (S.D.N.Y. 1921) (finding that the trademark "Aspirin" fell into the public domain due, in part, to the trademark holders' actions).

3 15 U.S.C. §§ 1058–59.

4 *Id.* § 1127; Yokum v. Covington, 216 U.S.P.Q. 210 (T.T.A.B. 1982); Dual Groupe, LLC v. Gans-Mex LLC, 932 F. Supp. 2d 569, 573–74 (S.D.N.Y. 2013) (discussing the license of unregistered trademarks).

5 15 U.S.C. § 1060; Clark & Freeman Corp. v. Heartland Co., 811 F. Supp. 137, 139–40, 139 n.2 (S.D.N.Y. 1993).

6 15 U.S.C. § 1125.

7 *Id.* § 1125(a)(1); Polaroid Corp. v. Polarad Elecs. Corp., 287 F.2d 492, 495 (2d Cir. 1961), *cert. denied*, 368 U.S. 820 (1961); Vitaroz Corp. v. Borden, Inc., 644 F.2d 960, 966–69 (2d Cir. 1981).

elements, that is used to identify one's goods or services and distinguish them from others.[8] In addition to source identifying indicia, such as product names[9] and service marks,[10] trademarks law provides the mean to register shared qualitative or organizational symbols. Certification marks signal geographic origin or quality, such as "champagne" or "organic"[11] while collective marks, such as AAA, refer to membership in an organization.[12] Trademark owners who use their marks in the U.S. need not register with the USPTO in order to gain many protections afforded by law. Use "in commerce" even without federal or state registration confers trademark rights within the geographic area of use if the mark is sufficiently distinctive and not barred.[13]

Although registration is not necessary to obtain some protection, mark owners often seek to buttress their rights by registering their marks with the USPTO.[14] Trademarks may be registered at the state level, nationally with the USPTO, or through international agreements.[15] In the U.S., the two-tiered system endures from the time when much commerce was limited to local exchanges. Mark owners may register their marks with individual states, but state protection extends only to the

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8 15 U.S.C. § 1127; *see also* Kellogg Co. v. Nat'l Biscuit Co., 305 U.S. 111, 120 (1938) (holding that "Shredded Wheat" could not be a trademark since it was "primarily associated with the article rather than a particular producer"); RESTATEMENT (THIRD) OF UNFAIR COMPETITION § 9 (AM. LAW INST. 1995).

9 15 U.S.C. § 1127; Coca-Cola Co. v. Koke Co. of Am., 254 U.S. 143, 145–46 (1920).

10 15 U.S.C. § 1127.

11 *See id.*

12 *Id.*; *see also* Prof'l Golfers Ass'n of Am. v. Bankers Life & Cas. Co., 514 F.2d 665, 670–71 (5th Cir. 1975) (discussing the PGA collective mark).

13 15 U.S.C. § 1052; Gen. Healthcare Ltd. v. Qashat, 364 F.3d 332, 335 (1st Cir. 2004) ("Trademark rights may arise under either the Lanham Act or under common law, but in either circumstance, the right is conditioned upon use in commerce.").

14 *See, e.g.*, 15 U.S.C. § 1057(b) (presumption of validity); *id.* § 1065 (incontestability); *id.* § 1117; *id.* § 1121; B & B Hardware, Inc. v. Hargis Indus., Inc., 575 U.S. 138, 142 (2015) ("Registration is significant. The Lanham Act confers "important legal rights and benefits" on trademark owners who register their marks."); In re Brunetti, 877 F.3d 1330, 1344 (Fed. Cir. 2017), *aff'd sub nom.* Iancu v. Brunetti, 139 S. Ct. 2294 (2019) (listing benefits).

15 *See* 15 U.S.C. § 1126; *Qashat*, 364 F.3d at 33.

boundaries of that state,[16] and therefore requires the filing and maintenance of multiple applications in order to gain even regional protection. Common law assigns trademark rights to the first user of a mark for a particular business.[17] If two firms use the same mark in the same geographic location, the first user will win a battle over the mark because it began using the mark first, and therefore has priority.[18]

The common law of trademarks is founded on both the idea of protecting business investment in symbols and minimizing consumer confusion or deception.[19] From these twin policy goals comes the rule that two users may develop the same mark on products in different locations, each can have rights in their mark limited to their geographic territory.[20] Only when the two overlap does the conflict arise. In such cases, courts must assess who used the mark first in the region to determine who has priority.

For the relatively modest cost of prosecuting an application, federal registration confers significant benefits on mark owners by minimizing costs and strengthening the economic value of a

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16 15 U.S.C. § 1065 (noting the existence of state trademarks); Dorpan, S.L. v. Hotel Melia, Inc., 728 F.3d 55, 62 (1st Cir. 2013) ("Trademark users may still gain state law rights to use a trademark either through registration with a state government or through use in that state."); 3 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 22.1, Westlaw (5th ed. database updated Mar. 2020) (explaining that the protection extended by state trademarks is limited to within the boundaries of the state or the geographic region of the marks use).

17 United Drug Co. v. Theodore Rectanus Co., 248 U.S. 90, 100 (1918) ("Undoubtedly, the general rule is that, as between conflicting claimants to the right to use the same mark, priority of appropriation determines the question."); Emergency One, Inc. v. Am. Fire Eagle Engine Co., 332 F.3d 264, 267 (4th Cir. 2003).

18 *See Emergency One*, 332 F.3d at 26. ("When more than one user claims the exclusive right to use an unregistered trademark, priority is determined by 'the first actual use of [the] mark in a genuine commercial transaction.'").

19 *See* 1 MCCARTHY, *supra* note 16, § 2:1 (discussing the dual goals of trademark law).

20 *See* Hanover Star Milling Co. v. Metcalf, 240 U.S. 403, 415 (1916) ("But where two parties independently are employing the same mark upon goods of the same class, but in separate markets wholly remote the one from the other, the question of prior appropriation is legally insignificant; unless . . . the second adopter has selected the mark with some design inimical to the interests of the first user . . . ."); *see also* 5 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 26:3, Westlaw (5th ed. database updated Mar. 2020).

mark in multiple ways. One advantage is that registration may confer nationwide rights in the U.S., regardless of whether the mark is actually being used nationwide.[21] Therefore, federal registration may be more cost effective and efficient than securing trademark rights even in a group of states. It minimizes priority battles by giving the first registrant nationwide priority without having to prove first use. A limited area exception does provide some protection to first users who fail to register.[22] A subsequent registration will confer nationwide priority to their competitor, but the senior user may continue to use the mark wherever their use preceded the federal application date.[23] Although federal law provides some protection to senior users who fail to register, it effectively locks them into their common law territory, giving the junior user who registered priority in the rest of the nation, regardless of their current geographic scope of business.[24]

Even before a brand is being used nationwide, federal registration empowers the brand owner to seek an injunction requiring later adopters to select another mark as soon as the brand owner expands into the junior user's geographic territory.[25] Therefore, the possibility of securing nationwide priority is a strong incentive for seeking federal registration even if a mark is not presently being used in commerce across the U.S..

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[21] 15 U.S.C. §§ 1072, 1057(c); Zirco Corp. v. Am. Tel. & Tel. Co., 21 U.S.P.Q.2d 1542 (T.T.A.B. 1991) (discussing constructive use and priority for intent-to-use filings).

[22] 15 U.S.C. §§ 1052, 1057(c).

[23] *See id.*; *see, e.g.,* Dudley v. Healthsource Chiropractic, Inc., 883 F. Supp. 2d 377, 389 (W.D.N.Y. 2012) ("Federal registration, however, does not give priority over persons who had used and had not abandoned the mark prior to filing. A senior user retains common law rights to exclusively use the mark within its territory of prior use.") (internal citations omitted).

[24] *See* 15 U.S.C. §§ 1052, 1057; *Dudley*, 883 F. Supp. 2d at 389.

[25] *See, e.g.*, Dawn Donut Co. v. Hart's Food Stores, Inc., 267 F.2d 358, 365 (2d Cir. 1959) (denying injunctive relief after finding no likelihood of confusion but clarifying that "the plaintiff may later, upon a proper showing of an intent to use the mark at the retail level in defendant's market area, be entitled to enjoin defendant's use of the mark").

Registration likewise constitutes prima facie evidence of the validity of the mark and all the information set forth in the application, including the date of first use and identity of the owner.[26] Owners can attach a statutory registration notice to their marks,[27] signaling that they understand their intellectual property rights and may be prepared to assert them. Federal registration also confers on mark owners the possibility of obtaining enhanced or statutory damages for counterfeiting.[28]

Trademark registration can serve as an effective deterrent to new entrants who might have considered adopting a similar brand in a competitive field. If a mark appears in the USPTO's online database, potential applicants will see that another entity has secured rights in the brand. If they too are seeking to maximize success and minimize obstacles in the registration process, the new entrant may eliminate any word, design or symbol that has already been registered by other similar organizations. In this way, a mark's appearance on the Principal Register confers potentially significant deterrent value. If a new entrant misses a registration that is confusingly similar, the USPTO may catch it and deny the application without the senior user taking any action at all. In such cases, trademark examiners stand ready to refuse to register any marks that are confusingly similar to those present on the Principal Register.

The trademark registration process proceeds as follows.[29] Before an application may be filed, the business must settle on a specific symbol for use in connection with a defined group of goods and services. Future mark owners may seek legal counsel in selecting a mark in order to increase the

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[26] 15 U.S.C. § 1057(b).

[27] *Id.* § 1111.

[28] 4 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 25:15, Westlaw (5th ed. database updated 2020) ("A counterfeit of a mark that is registered on the principal register in the United States Patent and Trademark Office for such goods or services sold, offered for sale, or distributed and that is in use, whether or not the person against whom relief is sought knew such mark was so registered.").

[29] *Trademark Process*, U.S. PATENT & TRADEMARK OFFICE, https://www.uspto.gov/trademarks-getting-started/trademark-process#step6 (last modified Feb. 15, 2020, 7:40 AM).

likelihood of obtaining approval for registration from the USPTO and to decrease the risk of their use or application prompting a litigious reaction from a third party. In this initial phase, the applicant must specify the symbol and the good or services with which the mark will be used. Before filing an application, the applicant will be more successful if thoughtful consideration is given to whether registration may be barred by one of the provisions in Section 2 of the Lanham Act. The most common bar is Section 2(d) which permits an examiner to deny registration if the mark is confusingly similar to another mark already present in the USPTO trademark database.[30]

Once the mark is selected, an applicant may prepare and submit an application. All applications must be submitted through the USPTO's online platform and require payment of an application fee in the range of $225 to $400 for each mark in each class of goods and services.[31] After the application is submitted, an examining attorney is assigned to review it.[32] During this phase an examination of the application materials will proceed and include a search for confusingly similar marks that are currently registered.[33] If the examining attorney decides that the mark does not meet the registration requirements or something else is defective in the application, she will issue an "office action" enumerating the applicable statutory bars or other defects.[34] The applicant will then be given six months to respond or repair the defect.[35] If no office action issues or if the applicant cures the defect, the mark will proceed to be published in the Official Gazette.[36] Publication marks USPTO approval of the application, but opens a thirty day window for third parties to oppose the registration before it

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30 *See Possible Grounds for Refusal of a Mark*, U.S. PATENT & TRADEMARK OFFICE, https://www.uspto.gov/trademark/additional-guidance-and-resources/possible-grounds-refusal-mark (last modified July 11, 2016, 6:07 PM).

31 *USPTO Fee Schedule*, U.S. PATENT & TRADEMARK OFFICE, https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Fees (last modified Mar. 1, 2020, 12:00 AM).

32 Trademark Process, *supra* note 29.

33 *See id.*

34 *See id.*

35 *Id.*

36 *Id.*

occurs.[37] While two out of every three applications receive an office action, only about 3% are challenged post-publication through opposition proceedings.[38]

If no opposition is filed or if the opposition is unsuccessful, a registration certificate will issue, if the application was based on current use.[39] If the applicant applied to register the mark based on a good faith intent to use the mark in commerce, the USPTO will issue a notice of allowance conditioned upon filing a statement of use within six months from the notice date or the request of an extension for the filing of such a statement.[40] Statements of use also undergo an examining attorney's review before a registration certificate is issued.[41] Trademarks must also be maintained with affidavits of continued use and filing fees at regular intervals.[42]

Overall, trademark registration can cost a few hundred to thousands of dollars when one considers all possible fees that can be applicable during the application process. Hiring a trademark attorney to handle the entire process can introduce additional costs to the process. While the costs are not as high as those of the patent application process, they do increase the cost moderately, and potentially significantly if the application confronts obstacles through multiple rounds of office actions or opposition proceedings.

A recent study by one of us (with Jon McClanahan) empirically examined whether lawyers make a difference in prosecuting federal trademark applications and, if so, how much.[43] After examining 5,489,586 federal trademark applications filed from 1984 to 2012, their study demonstrates that while trademark lawyers are not essential to prosecuting a successful trademark application,

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37 *Id.*
38 Deborah R. Gerhardt & Jon P. McClanahan, *Do Trademark Lawyers Matter?*, 16 STAN. TECH. L. REV. 583, 620 (2013).
39 Trademark Process, *supra* note 29.
40 *See id.*
41 *Id.*
42 *See* 15 U.S.C. § 1058; *Trademark Process*, *supra* note 29.
43 Gerhardt & McClanahan, *supra* note 38, at 622.

having an attorney, and especially an attorney with trademark experience, significantly increases success rates before the USPTO.[44] They also found that most applications had to overcome at least one office action before advancing to publication.[45] For example, their data shows that if an office action is issued, applications handled by lawyers had a 72% success rate compared to a 45% success rate of *pro se* applicants.[46]

Given this latter study and others demonstrating that many variables affect the trademark application process, we undertake the task to understand how race and gender play a role in the trademark registration process through the analysis of bulk trademark data. In examining the extent to which race and gender effect success rates, the following discussion will consider those variables against other literature that may explain differences in application success rates, such as the extent to which the presence of experienced counsel may affect any such differences.

III. Literature Review

In this Part, we provide a brief overview of recent literature on race and gender discrimination generally and then review legal scholarship on race and gender disparities in registering intellectual property rights, a common metric for measuring intellectual property ownership. This Part describes these effects by field, surveying a large body of social science literature and legal scholarship on the subject, and showing that compared to patent and copyright work, relatively little was previously known about gender disparities in trademark registration.[47]

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[44] *Id.* at 593, 622.
[45] *Id.* at 615, 622.
[46] *Id.* at 622.
[47] *See infra* Section III.B. *See generally* Ajanli Vats & Dierdre A. Keller, *Critical Race IP*, 36 CARDOZO ARTS & ENT. L.J. 735, 755 (2018).

A. Empirical Literature on Race and Gender Discrimination

Despite federal legislation designed to remedy gender inequality, discrimination against women has been well documented. Research shows that women suffer from discrimination at hiring and promotion.[48] Women experience pay inequity,[49] discrimination in receiving healthcare,[50] and in higher education admission and promotion. They also experience more sexual harassment than men.[51] Female led households experience discrimination in the rental business.[52] Discrimination has also been documented on online platforms such as e-bay, where female sellers are paid less than men and tend to get fewer bids in auctions.[53] Such inequities persist despite cultural movements like #MeToo that have dramatically increased awareness of sexual harassment and consequential discrimination.

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[48] Kim M. Blankenship, *Bringing Gender and Race in: U.S. Employment Discrimination Policy*, 7 GEND. SOC. 204 (1993); Susan Trentham & Laurie Larwood, *Gender Discrimination and the Workplace: An Examination of Rational Bias Theory*, 38 SEX ROLES 1 (1998); Donna Bobbitt-Zeher, *Gender Discrimination at Work: Connecting Gender Stereotypes, Institutional Policies, and Gender Composition of Workplace*, 25 GEND. SOC. 764 (2011); Kim Parker & Cary Funk, *Gender Discrimination Comes in Many Forms for Today's Working Women*, PEW RESEARCH CENTER, Dec. 14, 2017 (showing that there still exists gender discrimination in the US based on 42% of women surveyed reporting that they have suffered discrimination in their workplace in different forms such as income-based, unequal treatment in their work load, less support and discriminatory treatment in promotion); *Sex-Based Charges (Charges filed with EEOC) FY 1997 - FY 2019*, EEOC ,https://www.eeoc.gov/eeoc/statistics/enforcement/sex.cfm. (data compiled by the EEOC's Office of Enterprise Data and Analytics and summarizes the number of charges filed and resolved under Title VII alleging sex-based discrimination, going through FY 2019).

[49] Francine D. Blau & Lawrence M. Kahn, *Gender Differences in Pay*, 14 J. ECON. PERSPECT. 75 (2000); Casey B. Mulligan & Yona Rubinstein, *Selection, Investment, and Women's Relative Wages over Time*, 123 Q. J. ECON. 1061 (2008); Hadas Mandel, *Up the Down Staircase: Women's Upward Mobility and the Wage Penalty for Occupational Feminization, 1970–2007*, 91 SOC. FORCES 1183 (2013); Michelle J. Budig & Paula England, *The Wage Penalty for Motherhood*, 66 AM. SOCIOL. REV. 204 (2001).

[50] Diane E. Hoffmann & Anita J. Tarzian, *The Girl Who Cried Pain: A Bias Against Women in the Treatment of Pain*, 29 J.L. MED. & ETHICS 13 (2001).

[51] Gillian K. Steelfisher et al., *Gender Discrimination in the United States: Experiences of Women*, 54 HEALTH SERV. RES (2019); Remus Ilies et al., *Reported Incidence Rates of Work-Related Sexual Harassment in the United States: Using Meta-Analysis to Explain Reported Rate Disparities*, 56 PERS. PSYCHOL. 607 (2006).

[52] George Galster & Peter Constantine, *Discrimination Against Female-Headed Households in Rental Housing: Theory And Exploratory Evidence*, 49 REV. SOC. ECON. 76 (1991).

[53] Tamar Kricheli-Katz & Tali Regev, *How Many Cents on the Dollar? Women and Men in Product Markets*, 2 SCI. ADV. 1 (2016).

Discrimination against African-Americans has been extensively studied and documented.[54] Racial disparities have been shown in hiring and pay.[55] Additional surveys and studies document discrimination against other minority groups in the U.S., such as Latinx, Asians, and Native-Americans, although not as extensively as discrimination against African Americans. While only 29.61% of whites reported racial discrimination, 69.54% of African-American, 56.59% of Asians, and 45.01% of Latinx experience discrimination from time to time or regularly.[56] For example, a 2017 poll shows that at least half of African-Americans reported discrimination at work and by the police; one third of Latinx claim they have experienced discrimination at work and when seeking housing; one third of Native-Americans suffer from racial slurs, violence, and harassment in their workplace; and one quarter of Asians report being racially discriminated at work and in housing.[57] A recent study found that 63.10% of minorities report they have experienced racial discrimination.[58] Race-based bullying in workplaces has also been reported, with the Latinx group reporting the greatest amount of harm.[59] Next, we turn to how this general pattern is reflected in the prosecution of intellectual property rights.

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54 Devah Pager, *The Mark of a Criminal Record*, 108 AM. J. SOCIOL. 937 (2003).

55 Kevin Lang & Michael Manove, *Education and Labor Market Discrimination*, 101 AM. ECON. REV. 1467 (2011); Marianne Bertrand & Sendhil Mullainathan, *Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination*, 94 AM. ECON. REV. 991 (2004); Zvi Eckstein & Kenneth I. Wolpin, *Estimating the Effect of Racial Discrimination on First Job Wage Offers*, 81 REV. ECON. STAT. 384 (1999).

56 *Id.*

57 *Discrimination in America Polls* ,Harvard T.H. Chan School of Public Health, 2017 ,https://www.hsph.harvard.edu/magazine/magazine_article/discrimination-in-america-polls/

58 Randy T. Lee et al., *On the Prevalence of Racial Discrimination in The United States*, 14 PLOS ONE 1 (2019).

59 Suzy Fox & Lamont E. Stallworth, *Racial/ethnic Bullying: Exploring Links Between Bullying and Racism in the US Workplace*, 66 J. VOCAT. BEHAV. 438 (2005).

B. Gender and Race Disparities in Patent Prosecution

Patents are platinum level intellectual property rights. They are the most expensive to obtain and provide their owners with the strongest monopoly but for the shortest period of time. The USPTO does not collect demographic information (e.g., gender and race) for inventors. Nonetheless, through use of inventor names and cross-referencing other datasets, empirical scholarship to date has revealed significant race and gender underrepresentation.

Innovation is expensive. Inventors and entrepreneurs need patents to protect against free-riding on investments in their inventions as well as their investments in commercializing those inventions.[60] Patents also help to signal an enterprise's technological expertise and the innovative legitimacy of its products and services to potential investors and potential cross-licensing partners.[61] Patent owners can even use their patents to ward off infringement lawsuits by meaningfully threatening to countersue for infringement.[62] Importantly, patent applications and patents also increase the probability of obtaining necessary investment funding from various sources.[63]

Despite the economic importance of patents, research has repeatedly shown that women have less access to patent protections than men. Study after study, including a comprehensive 2016 World Intellectual Property Organization (WIPO) analysis of international patent application patterns, has

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60 Institute for Women's Policy Research, *IWPR Calculations of Data from the 2012 Survey of Business Owners Accessed through the U.S. Census Bureau's American Fact Finder* (2015). *See generally* Michael Abramowicz & John F. Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337 (2008) (discussing the commercialization of technology and its relationship to patents and profits). *But see* Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 343–47 (2010) (questioning whether the current patent system provides adequate protection for commercialization investments).

61 Stuart J. H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255, 1287–1309 (2009) (discussing the value of patents in the context of startup companies).

62 Ted Sichelman & Stuart J.H. Graham, *Patenting by Entrepreneurs: An Empirical Study*, 17 MICH. TELECOMM. & TECH. L. REV. 111, 113, 124–25 (2010) (and sources cited therein).

63 Graham et al., *supra* note 61, at 1262, 1276; Sichelman & Graham, *supra* note 62, at 122–23; JESSICA MILLI ET AL., THE GENDER PATENTING GAP 7 (Inst. for Women's Policy Research, 2016), https://iwpr.org/wp-content/uploads/2016/07/C441_Gender-Patenting-Gap_BP-1.pdf.

shown a sizeable gender gap in applications, grants and ownership of patents. Less than thirty percent of international patent applications list a female inventor, and fewer than five percent list only female inventors.[64]

Patented technologies invented by women have been shown to be comparable in quality and impact to those filed by men.[65] Nonetheless, patented inventions by women were more likely to be rejected or confront an obstacle in the application process, and were less likely to be appealed.[66] Patent applications by women inventors are twenty-one percent more likely to be rejected by the patent office than those submitted by men.[67] Examiners allowed fewer claims in women's patents and narrowed the claims that they did allow in scope and value more than those in men's applications.[68] Finally, patents granted to women are less frequently cited and less likely to be maintained by their assignees.[69]

This gender gap has consequences. Given the value of patents to technological advances and entrepreneurship, this gap presents an obstacle for women in commercializing their innovations. Empirical studies suggest that the patent gender gap stems in part from bias among USPTO

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64 Gema L. Martinez et al., *Identifying the Gender of PCT Inventors*, 33 WIPO ECON. & STAT. SERIES 8 (2016); *see also* INTELLECTUAL PROP. OFFICE, GENDER PROFILES IN WORLDWIDE PATENTING, AN ANALYSIS OF FEMALE INVENTORSHIP 30 (2016), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/567518/Gender-profiles-in-worldwide-patenting.pdf (UK). Academic patenting shows similar disparities, even in fields approaching gender parity (such as bioscience), and women tend to be listed as inventors less frequently than they publish. Rainer Frietsch et al., *Gender-Specific Patterns in Patenting and Publishing*, 38 RES. POL'Y 590, 595 (2009); Annette I. Kahler, *Examining Exclusion in Woman-Inventor Patenting: Comparison of Educational Trends and Patent Data in the Era of Computer Engineer Barbie*, 19 AM. U. J. GENDER SOC. POL'Y & L. 773, 776–78 (2011).

65 G. Steven McMillan, *Gender Differences in Patenting Activity: An Examination of the US Biotechnology Industry*, 80 SCIENTOMETRICS 683, 683 (2009); Kjersten Bunker Whittington & Laurel Smith-Doerr, *Gender and Commercial Science: Women's Patenting in the Life Sciences*, 30 J. TECH. TRANSFER 355, 364–67 (2005) (measuring patent quality based on its impact and usefulness for follow-up innovation, measured by forward and backward patent citations).

66 Kyle Jensen et al., *Gender Differences in Obtaining and Maintaining Patent Rights*, 36 NATURE BIOTECHNOLOGY 307, 307 (2018).

67 *Id.* at 307–08 (finding that "women inventors were 21% less likely than men inventors to have their application accepted, but that difference declined to 7% after technology-class fixed effects were included.").

68 *Id.*

69 *Id.* at 308.

examiners.[70] Gender gaps in patent grant rates were more pronounced when applicants had names easily recognizable as feminine.[71] A study by one of us analyzed more than 3.9 million U.S. patent applications and found that applications filed by women are less likely to be granted than those by men.[72] This difference was found to be independent of application quality and might be interpreted as evidence of subconscious discrimination against women in the patenting process.[73]

Studies of the intersection of IP law and gender have also identified gender disparities in the rights afforded by several intellectual property regimes.[74] These factors fall into three categories: the way IP doctrines apply to subject matter involving gender and sexuality; the gendered nature of the various IP doctrines themselves; and gender disparities in participation in IP systems.[75]

Many patent doctrines that appear facially neutral result in a masculine bias in practice.[76] The nebulous "PHOSITA" ("Person Having Ordinary Skill In The Art") standard for utility and nonobviousness in patentability is subject to cultural biases and assumptions about who is skilled in a given art.[77] Likewise, what counts as patentable subject matter depends on what counts as an

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70 *See* Jensen et al., *supra* note 66, at 308–09.

71 *Id.* at 309.

72 Michael Schuster et al., *An Empirical Study of Patent Grant Rates as a Function of Race and Gender,* 57 AM. BUS. L. J. (forthcoming 2020) ("Our analysis of more than 3.9 million patent applications provides evidence that patents are not equally available to some segments of society. Both women and minority inventors are less likely to have their patent applications granted.").

73 *Id.* ("Our results show—consistent with implicit bias theories, data on social stereotypes, and the existing literature on gender and patenting—some negative bias is introduced during prosecution of female inventor applications.")

74 *See generally* Kara W. Swanson, *Intellectual Property and Gender: Reflections on Accomplishments and Methodology*, 24 AM. U. J. GENDER, SOC. POL'Y & L. 175, 176, 183–84 (2015) (examining factors that lead to gender disparity in IP including barriers to women entering scientific fields and issues with how IP law is actually applied).

75 *Id.* at 176.

76 *Id.* at 185, 191; *see also* Fiona Murray & Leigh Graham, *Buying Science and Selling Science: Gender Differences in the Market for Commercial Science*, 16 INDUS. & CORP. CHANGE 657, 667–70 (2007).

77 Dan L. Burk, *Diversity Levers*, 23 DUKE J. GENDER L. & POL'Y 25, 42 (2015); Dan L. Burk, *Do Patents Have Gender?,* 19 AM. U. J. GENDER SOC. POL'Y & L. 881, 883–84, 907–09 (2011).

"invention," "technology," and "industrial application," categories that may be less charitable to inventive contributions in fields dominated by women.[78]

Female inventors face additional hurdles in accessing the patent system. Prosecuting a patent application successfully requires access to a patent agent and a substantial investment of time and money.[79] Women tend to have fewer financial resources, however, including access to venture capital and other funding.[80] Women have less access to networks of experienced professionals and other support structures that can aid them in navigating the patenting process.[81] Sexism from peers, industry contacts, customers, and even patent examiners also plays a role in whether women perceive their own work as patentable and whether others perceive that work as important.[82] In sum, substantial research documents why women secure patents far less frequently than men.

Racial and ethnic gaps in patenting have received less scholarly attention than gender, but nonetheless, multiple empirical studies confirm racial underrepresentation in patent prosecution. Cook and Kongcharoen conducted a study systematically examining patenting patterns and identified just over 1000 African-American inventors from a pool of approximately 1.2 million U.S. inventor

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78 Shlomit Yanisky-Ravid, *Eligible Patent Matter—Gender Analysis of Patent Law: International and Comparative Perspectives*, 19 AM. U.J. GENDER SOC. POL'Y & L. 851, 875–80 (2011).

79 *See* USPTO Fee Schedule, *supra* note 31.

80 Alicia Robb, Small Bus. Admin., Office of Advocacy, *Access to Capital Among Young Firms, Minority-Owned Firms, Women-Owned Firms, and High-Tech Firms* 31 (2013), https://www.sba.gov/sites/default/files/files/rs403tot(2).pdf; Paula E. Stephan & Asmaa El-Ganainy, *The Entrepreneurial Puzzle: Explaining the Gender Gap*, 32 J. Tech. Transfer 475, 480–81 (2007).

81 *See* Fiona Murray & Leigh Graham, *Buying Science and Selling Science: Gender Differences in the Market for Commercial Science*, 16 INDUS. & CORP. CHANGE 657, 667–70 (2007); Stephan & El-Ganainy, *supra* note 80, at 483–84; Wenpin Tsai & Sumantra Ghoshal, *Social Capital and Value Creation: The Role of Intrafirm Networks*, 41 ACADEMY MGMT. J 464, 473 (1998).

82 NATI'L WOMEN'S BUS. COUNCIL, INTELLECTUAL PROPERTY AND WOMEN ENTREPRENEURS: QUALITATIVE ANALYSIS 16–17 (2012), https://cdn.www.nwbc.gov/wp-content/uploads/2018/02/27192554/Qualitative-Analysis-Intellectual-Property-Women-Entrepreneurs-Part-2.pdf; Christine Wenneras & Agnes Wold, *Nepotism and Sexism in Peer-Review,* 387 NATURE 341, 341 (1997).

names.[83] Consistent with this finding, a recent study by Schuster and his co-authors has shown that minority inventors are less likely to secure patents compared to white male inventors.[84]

Additional studies add some interesting nuances. The Institute for Women's Policy Research found that Asians were the most likely to have applied for a patent in the past five years as compared to men and women in other racial and ethnic groups respectively, with Hispanic and Black inventors being the least likely to file patent applications.[85] The study also found that applications by inventors of color were also less likely to be granted, particularly among women of color.[86] While more empirical research is needed, the limited empirical data demonstrate the distributive effects of patents with regards to ethnicity and race.

These studies suggest that further research should be conducted to confirm whether patent examination at the USPTO offers a gender and racially unbiased examination process.

C. Gender, Race and Copyright Registration

From an international perspective, copyright registries are rare. Because the U.S. Copyright Office has maintained a copyright registry for decades, it provides a potential wealth of information on copyright ownership over time. Unfortunately, unlike USPTO data, the copyright office data is not publicly available in bulk format. Despite this challenge, Professors Brauneis and Oliar performed an extensive empirical study of gender, racial, and age patterns in U.S. copyright registration from 1978–

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[83] Cook & Kongcharoen, at 28; JESSICA MILLI ET AL., THE GENDER PATENTING GAP 7 (Inst. for Women's Policy Research, 2016), https://iwpr.org/wp-content/uploads/2016/07/C441_Gender-Patenting-Gap_BP-1.pdf.

[84] *See* Schuster et al., *supra* note 72.

[85] Jessica Milli et al., *Equity in Innovation: Women Inventors and Patents* 5 (Inst. for Women's Policy Research, Report #C448, 2016), https://iwpr.org/wp-content/uploads/wpallimport/files/iwpr-export/publications/C448%20Equity%20in%20Innovation.pdf. (finding that the gender gap in patent applications is narrower among people of color, particularly among Hispanic and Black graduates.)

[86] *Id.* at 6.

2012.[87] Their analysis shows interesting differences in both the types of works and registration rates for various groups.[88] They found that white authors are substantially overrepresented accounting for nearly 80% of registrations or 116% of their proportion of the general population.[89] Interestingly, black authors are even more overrepresented, accounting for 14-15% of all registrations,[90] or 120% of their proportion of the general U.S. population.[91] Latinx authors had the lowest registration rate, accounting for less than ten percent of all copyright registrations, a rate only 44.6% of their proportion of the general U.S. population.[92]

Brauneis and Oliar also found that members of different races and ethnicities differ substantially in the types of work they register.[93] For example, white authors predominate in dramatic works and software, while black authors predominate in music and drama, and Latinx authors predominate in music and movies. Asians and Pacific Islanders were the strongest in art and software and weakest in music and drama,[94] while those identified as Jewish were associated with a high per-capita rate of registrations, mainly of textual works.[95]

With regard to gender, Brauneis and Oliar found that two-thirds of registered authors were male but that this gender gap differs across types of works[96] and that female authors increased their representation over time.[97] The proportion of registered female authors nonetheless remained at less

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[87] Robert Brauneis & Dotan Oliar, *An Empirical Study of the Race, Ethnicity, Gender, and Age of Copyright Registrants*, 86 GEO. WASH. L. REV. 46 (2018).
[88] *Id.* at 59-60.
[89] *Id.*
[90] *Id.* at 62.
[91] *Id.*
[92] *Id.* at 60-61.
[93] *Id.* at 62-63.
[94] *Id.* at 63.
[95] *Id.* at 66-67.
[96] *Id.* at 73-77.
[97] *Id.* at 73.

than the proportion of women in the labor force.[98] The fields least dominated by male authors were art and text, while the fields most dominated by men were movies and software.[99] The degree to which female authors were increasing in representation varied by type of work[100] and was driven mainly by textual works.[101]

A number of scholars analyze the intersection of copyright law and gender from a feminist perspective, and some conclude that the doctrines and the institutions that apply it have done so in a way that undermines women's creativity. Professor Wright conducted an early feminist analyses of copyright law, focusing on two genres that were denigrated despite—or perhaps because of—significant contributions from women: the English novel and needlework.[102] She concludes that creative women have been marginalized by ideologies surrounding the artistic process such that women authors and artists are not recognized as creators of "art" but rather of "crafts" and "domestic arts" below the minimum threshold for legal protection.[103] Copyright law's economic and moral rights, by contrast, are more individualistic and patriarchal, such that protected categories of art become "masculinized."[104]

Other legal scholars have also suggested that copyright tends to exclude female forms of creativity and knowledge.[105] Copyright laws thus have an impact upon whether women are treated

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[98] *Id.*
[99] *Id.* at 75-76.
[100] *Id.* at 76.
[101] *Id.*
[102] *See* Shelley Wright, *A Feminist Exploration of the Legal Protection of Art*, 7 CAN. J. WOMEN & L. 59 (1994).
[103] *Id.* at 96.
[104] *Id.*
[105] Ann Bartow, *Fair Use and the Fairer Sex: Gender, Feminism and Copyright Law,* 14 AM. U. J. GENDER SOC. POL'Y & L. 551, 554-55, 557, 562 (2006); Dan L. Burk, *Copyright and Feminism in Digital Media,* 14 AM. U. J. GENDER SOC. POL'Y & L. 519, 546, 549 (2006); Emily Chaloner, Comment, *A Story of Her Own: A Feminist Critique of Copyright Law*, 6 I/S: J.L. & POL'Y FOR INFO. SOC'Y 221, 224, 226 (2010); Terra L. Gearhart-Serna, *Women's Work, Women's Knowing: Intellectual Property and the Recognition of Women's Traditional Knowledge,* 21 YALE J.L. & FEMINISM 372, 374, 380 (2010); Deborah Halbert, *Feminist Interpretations of Intellectual Property*,

equally to men in copyright-related contexts.[106] Copyright doctrine's focus on individual author control over works may also interfere with feminist use of collaborative authorship or relational structures[107] rather than ensuring dynamic audience participation in the creative process.[108] Similarly, copyright law provides lesser protections for derivative works, such as fan fiction and art, that are often produced by and for women.[109]

Feminist analyses of copyrights in pornographic works by scholars such as Professor Bartow,[110] question whether pornography should be protectable without taking into account the harms that pornography production can inflict on those portrayed,[111] particularly without a regulatory or other scheme to safeguard safety and well-being by requiring consent.[112] Professor Bartow further suggests that copyright could in fact be used to combat pornography by withholding protection to

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14 AM. U. J. GENDER SOC. POL'Y & L. 431, 438-44 (2006); Victoria F. Phillips, *Commodification, Intellectual Property and the Quilters of Gee's Bend*, 15 AM. U. J. GENDER SOC. POL'Y & L. 359, 360 (2007); Malla Pollack, *Towards a Feminist Theory of the Public Domain, or Rejecting the Gendered Scope of United States Copyrightable and Patentable Subject Matter*, 12 WM. & MARY J. WOMEN & L. 603, 607-09 (2006) (arguing that the choice not to protect food and clothing under copyright law is gendered and anti-feminine); Rebecca Tushnet, *My Fair Ladies: Sex, Gender, and Fair Use in Copyright*, 15 AM. U. J. GENDER SOC. POL'Y & L. 273, 275, 303-04 (2007).

[106] *See* Bartow, *supra* note 105.

[107] *See* Burk, *supra* note 105.

[108] *See* Sonia K. Katyal, *Performance, Property, and Slashing of Gender in Fan Fiction*, 14 AM. U. J. GENDER SOC. POL'Y & L. 461 (2006); *see also* Sonia K. Katyal, *Slashing Gender and Intellectual Property: A View from Fan Fiction*, in DIVERSITY IN INTELLECTUAL PROPERTY: IDENTITIES, INTERESTS, AND INTERSECTIONS 315 (Irene Calboli & Srividhya Ragavan eds., 2015).

[109] *See* Rebecca Tushnet, *The Romantic Author and the Romance Writer: Resisting Gendered Concepts of Creativity*, *in* DIVERSITY IN INTELLECTUAL PROPERTY: IDENTITIES, INTERESTS, AND INTERSECTIONS 294 (Irene Calboli & Srividhya Ragavan eds., 2015).

[110] *See* Ann Bartow, *Pornography, Coercion, and Copyright Law 2.0*, 10 VAND. J. ENT. & TECH. L. 799 (2008); *see also* Ann Bartow, *Copyright Law and Pornography: Reconsidering Incentives to Create and Distribute Pornography*, 39 U. BALT. L.F. 75 (2008-09); Ann Bartow, *Copyright Law and Pornography*, 91 OR. L. REV. 1 (2012); Ann Bartow, *Copyright Law and the Commodification of Sex*, in DIVERSITY IN INTELLECTUAL PROPERTY: IDENTITIES, INTERESTS, AND INTERSECTIONS 339 (Irene Calboli & Srividhya Ragavan, eds., 2015).

[111] *See* Bartow, *Copyright Law and Pornography*, *supra* note 110.

[112] *See* Bartow, *Pornography, Coercion, and Copyright Law 2.0*, *supra* note 110.

sharply reduce the economic value of these works.[113] Other scholars have also shown how copyright law treats sexual content differently than other works.[114]

The intersection of race and copyright law has been explored by scholars such as Professor Greene who has shown how the IP system disadvantages black artists and others who historically did not have the access to capital, expertise, or even education necessary to apply and meet the qualifications for copyright protection.[115] Professor Greene's work on black artists explains that the "convoluted and complex" legal requirements for protection,[116] under which authors could easily find their works injected into the public domain, resulted in the loss of economic rights for many people of color.[117] Inequality of bargaining power and broad social discrimination contribute to these inequities.[118] Professor Greene also shows how certain rather discretionary copyright doctrines, such as the idea/expression dichotomy and the originality requirement, have disadvantaged black creators.[119]

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[113] *See* Bartow, *Copyright Law and Pornography*, *supra* note 110.

[114] *See* Jennifer Rothman, *Sex Exceptionalism in Intellectual Property*, 23 STAN. L. & POL'Y REV. 111 (2012); *see also* Tushnet, *My Fair Ladies*, *supra* note 105.

[115] *See* K.J. Greene, *Intellectual Property at the Intersection of Race and Gender: Lady Sings the Blues*, 16 AM. U. J. GENDER SOC. POL'Y & L. 365 (2008); *see also* K.J. Greene, *Copyright, Culture & Black Music: A Legacy of Unequal Protection*, 21 HASTINGS COMM. & ENT. L.J. 339 (1999); Ann Bartow, *Women In the Web of Secondary Copyright Liability and Internet Filtering*, 32 N. KY. L. REV. 449 (2005).

[116] Greene, *Copyright, Culture & Black Music*, *supra* note 115, at 354.

[117] *Id.*

[118] *Id.* at 356–57.

[119] *Id.* at 380-89; *see also* Keith Aoki, *Distributive Justice and Intellectual Property*: *Distributive and Syncretic Motives in Intellectual Property Law*, 40 U.C. DAVIS L. REV. 717, 763 (2007); Lateef Matima, *Copyright Social Utility and Social Justice Interdependence: A Paradigm for Intellectual Property Empowerment and Digital Entrepreneurship*, 112 W. VA. L. REV. 97, 123 (2009); John Tehranian, *Towards a Critical IP Theory: Copyright, Consecration, and Control*, 2012 BYU. L. REV. 1237, 1241-44 (2012); David Dante Troutt, *I Own Therefore I Am: Copyright, Personality, and Soul Music in the Digital Commons*, 20 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 373, 395-434 (2009).

D. Gender, Race and Trademark Registration

Many studies explore trademarks as indicators of innovation as we discuss in greater detail in the following section, but the intersection of gender, race, and trademark registration has not yet been examined empirically.[120] While both patents and copyright law require some level of innovation to obtain legal protection, trademark applications merely need to show use. Nonetheless, a patented product will need a trademark to differentiate it from the competition once the patent expires. Accordingly, some studies have explored the relation between trademarks and other forms of intellectual property and show that trademarks often compliment patent protection.[121] Other studies show a correlation between trademarks and entrepreneurial activities, establishing that trademarks can help entrepreneurs benefit from knowledge spillovers associated with intellectual property rights. Trademarks have also been used to capture the flows of innovation by studying which trademarks are

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[120] *See Sandro* Mendonça et al.,*Trademarks as an indicator of innovation and industrial change*, 33 RES. POL'Y 1385, 1401 (2004) (arguing that trademark data can be analyzed as an indicator of marketplace innovation and therefore an empirical tool for measuring wider patterns of economic activity); Claes Malmberg, *Trademark statistics as innovation indicators?-A micro study* 34–35 (CIRCLE, Lund U., Electronic Working Paper Series No. 17, 2005) (finding, in a study of Swedish industry, that trademarks are less reliable as indicators of new products in the electromechanical and automotive industries, but are highly and steadily correlated with new product output in the pharmaceutical industry); Meindert Flikkema, Ard-Pieter de Man & Carolina Castaldi, *Are Trademark Counts a Valid Indicator of Innovation? Results of an In-Depth Study of New Benelux Trademarks Filed by SMEs*, 21 IND. & INNOVATION 310, 327 (2014) (finding that a majority of new trademarks registered by small- to medium-sized businesses in Belgium, the Netherlands, and Luxembourg refer to product or service innovation).

[121] *See* Frederico Munari & Simone Santoni, *Exploiting complementarities in IPR mechanisms: The joint use of patents, trademarks and designs by SMEs* 17 (2009) 4th Annual Conference of the EPIP Association, https://www.epip.eu/conferences/epip04/files/MUNARI_Frederico.pdf (finding, based on a sample of small- to medium-sized manufacturing firms in Italy, "that firms that jointly recur to patenting and registration of trademarks and/or designs are associated with higher economic performance . . . than matched firms which do not use [intellectual property rights]."); Nabil Amara, Réjean Landry & Namatié Traoré, *Managing the protection of innovations in knowledge-intensive business services*, 37 RES. POL'Y 1530, 1542 (2008) (finding, based on Canadian innovation data, that patents, trademarks, and other IP protections are used by knowledge-intensive firms to complement each other to protect innovations from imitation by rival firms).

being registered by entrepreneurs regarding innovative products under development.[122] Service marks have been studied as innovation indicators.[123] Other measures of innovation have also been shown to correlate with trademark registration such as market value gains;[124] increases in productivity and profitability;[125] firm survival;[126] and other performance-related metrics.[127]

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[122] *See* Christian Lechnera, Gianni Lorenzoni & Enrico Tundisa, *Vertical disintegration of production and the rise of market for brands*, 6 J. OF BUS. VENTURING INSIGHTS 1, 5 (2016) (finding a positive correlation between the vertical disintegration as a factor that facilitates entry into markets, access to technology, and new venturing opportunities); Rajeev K. Goel, James W. Saunoris & Xingyuan Zhang, *Intranational and international knowledge flows: Effects on the formal and informal sectors*, 34 CONTEMP. ECON. POL'Y 297, 308 (2016) (finding "that formal entrepreneurs respect domestic intellectual property rights, but benefit from foreign patents, especially patents granted. In contrast, entrepreneurs in the informal sector positively benefit from domestic knowledge flows, more so from patent applications than patent grants, and especially so in the case of higher quality innovations. The spatial knowledge spillovers are most pronounced in the case of patents granted and this is true for the formal and the informal sectors.").

[123] *See* Ulrich Schmoch, *Service marks as novel innovation indicator*, 12 RES. EVALUATION 149, 155 (2003) (finding service marks to be correlated with innovation, particularly in knowledge-intensive industries, based on a study of EU marks); Ulrich Schmoch & Stephan Gauch, *Service marks as indicators for innovation in knowledge-based services*, 18 RES. EVALUATION 323, 334 (2009) (finding marks to be appropriate indicators of innovation activity in service industries internationally); Matthias Gotsch & Christiane Hipp, *Measurement of innovation activities in the knowledge-intensive services industry: a trademark approach*, 32 THE SERV. INDUS. J. 2167, 2181 (2012) (finding, based on a survey of German knowledge-intensive business services, a statistically strong and significant interrelation of trademark registrations and innovation).

[124] *See* Richard Hall, *The Strategic Analysis of Intangible Resources*, 13 STRATEGIC MGMT. J. 135, 143 (1992) (finding that trademarks, among other intangible assets such as company reputation and employee know-how, are sources of sustainable competitive advantages); William M. Landes & Richard A. Posner, *Trademark Law: An Economic Perspective*, 30 J.L. & ECON. 265, 268–73 (1987) (arguing that trademark law works to promote economic efficiency through a reduction of consumer information costs and incentivizing expenditures to maintain the high quality of goods and services).

[125] See Meryem Duygun, Vania Sena & Mohamed Shaban, Trademarking activities and total factor productivity: Some evidence for British commercial banks using a metafrontier approach, 72 J. OF BANKING & FIN. 70, 79 (2016) (finding that positive growth in total factor productivity among trademarking banks pre-2008 financial crisis was suggestive "of a strong link between trademarking status and capability to innovate and introduce new products into the market"); Christine Greenhalgh & Mark Rogers, Trade Marks and Performance in Services and Manufacturing Firms: Evidence of Schumpeterian Competition through Innovation, 45 AUSTRALIAN ECON. REV. 50, 68 (2012) (finding a positive association between stock market value and trademark activity among UK service and manufacturing firms).

[126] *See* Christine Greenhalgh & Mark Longland, *Running to Stand Still? – The Value of R&D, Patents and Trade Marks in Innovating Manufacturing Firms*, 12 INT. J. OF THE ECON. OF BUS. 307, 310 (2005) (finding that, due to depletion and inability to stave off imitation, firms must continually renew IP assets to maintain market position).

[127] *See* Christian Helmers & Mark Rogers, *Does patenting help high-tech start-ups?*, 40 RES. POL'Y 1016, 1025–26 (2011) (finding that technology start-ups' decision to patent is association with higher yearly asset growth in a study of UK-based firms).

If there were any doubt that trademark registration has become an important topic in legal scholarship, it was dispelled in 2017 when the Harvard Law Review published Rebecca Tushnet's article *Registering Disagreement: Registration in Modern American Trademark Law*.[128] In this article, Professor Tushnet calls for renewed attention to the importance of trademark registration, explains why trademark registration decisions make important distinctions between types of marks, and suggests improvements that could benefit trademark owners, their competitors, and consumers.[129]

Empirical scholarship on trademark registration has accelerated since the USPTO made its bulk data publicly available to scholars in 2010.[130] Professors Gerhardt and McClanahan analyzed whether the assistance of legal counsel increases the likelihood of overcoming obstacles in the federal trademark applications, and, if so, how much, by empirically studying trademark applications from 1984 through 2012.[131] Professors Beebe and Fromer empirically studied clutter on the USPTO Principal Register and found that the supply of desirable trademarks is not inexhaustible[132] and has already reached what they term trademark depletion and congestion.[133] Gerhardt and McClanahan reached the opposite conclusion with respect to color, finding that colors are claimed as marks much

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[128] Rebecca Tushnet, *Registering Disagreement: Registration in Modern American Trademark Law*, 130 HARV. L. REV. 867 (2017).

[129] *Id.* at 875–78 (explaining the benefits of the trademark register).

[130] Shukhrat Nasirov, *The Use of Trademarks in Empirical Research: Towards an Integrated Framework* 11 (Dec. 26, 2018) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3296064.

[131] *See* Deborah R. Gerhardt & Jon P. McClanahan, *Do Trademark Lawyers Matter?*, 16 STAN. TECH. L. REV. 583, 622 (2013) (finding that trademark lawyers have a significantly higher likelihood of prosecuting successful trademark applications and successfully rebutting office actions and opposition than pro se applicants).

[132] *See* Barton Beebe and Jeanne Fromer, *Are We Running Out of Trademarks? An Empirical Study of Trademark Depletion and Congestion*, 131 HARV. L. REV. 945, 1041 (2018) (finding that firms will likely always find at least some minimally communicative unregistered mark, but that increasing depletion and congestion will impose greater costs and less benefit on firms and increase consumer search costs).

[133] *Id.* at 950–51 (defining "trademark depletion" as "the process by which a decreasing number of potential trademarks remain unclaimed by any trademark owner," and defining "trademark congestion" and "the process by which an already-claimed mark is claimed by an increasing number of different trademark owners.").

less frequently than their expressive potential might suggest.[134] Our study adds to this growing body of scholarship by providing a foundation for understanding race and gender and gender and racial disparities that have not previously been studied with respect to trademark registration.

While no empirical work analyzes gender, race, and trademark registration,[135] some legal scholarship has focused on the intersection of trademark doctrine with gender or race. Professor Bartow, for example, noted to the tendency of judges to rely on personal intuition and stereotypes in deciding trademark matters.[136] Others consider sexualization of trademark analysis,[137] pointing out that courts adhere to stereotypes in deciding whether "feminine" marks have been damaged through further sexualization.[138]

Some scholars have noted that trademarks reflect societal perceptions of race, ethnicity, and identity.[139] Historically, advertising and trademarks specifically are rife with stereotyped images.[140] This includes not just black men[141] and black women,[142] but also Native-Americans and Asian-Americans.

The USPTO has wrestled with this issue in two recent widely reported cases involving race and trademark registration. Federal trademark law provides bars to registration, and until recently prohibited registration of any mark that "may disparage . . persons. . . or bring them into contempt,

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134 *See* Deborah R. Gerhardt & Jon P. McClanahan Lee, *Owning Colors*, 40 CARDOZO L. REV. 2483, 2546–47 (2019) (citing support for the powerful cognitive signals that colors are capable of imparting on consumers and finding 221 registrations of color as a trademark alone out of millions registered since the U.S. Supreme Court ruled color alone trademarkable in 1995).

135 Swanson, *supra* note 74, at 183-84.

136 *See* Ann Bartow, *Likelihood of Confusion*, 41 SAN DIEGO L. REV. 721, 722 (2004).

137 Leigh A. Hansmann, *Sex, Selling Power, & Salacious Commentary: Applying the Copyright Fair Use Doctrine in the Trademark Context*, 2008 MICH. ST. L. REV. 843, 859-60, 864 (2008). *See also* Rothman, *supra* note 114, at 127-28, 132-36.

138 Hansmann, *supra* note 137, at 862.

139 *See* Llewellyn Joseph Gibbons, *Semiotics of the Scandalous and Immoral and the Disparaging: Section 2(A) Trademark Law After Lawrence v. Texas*, 9 MARQ. INTELL. PROP. L. REV. 187, 196 (2005); Deseriee A. Kennedy, *Marketing Goods, Marketing Images: The Impact of Advertising on Race*, 32 ARIZ. ST. L.J. 615, 615-17 (2000).

140 *See* Ross D. Petty et al., *Regulating Target Marketing and Other Race-based Advertising Practices*, 8 MICH. J. RACE & L. 335, 347-49 (2003).

141 Greene, *Intellectual Property at the Intersection of Race and Gender*, *supra* note 115, at 375-76.

142 *Id.* at 376-77.

or disrepute."[143] Based on this statutory bar, Native-American plaintiffs sought to cancel the federal trademark registration for the Washington "REDSKINS" asserting that the mark is a racial slur. The USPTO granted the request; but it was reversed on appeal.[144] In a second case with different plaintiffs, the "Redskins" mark was challenged again.[145] The Trademark Trial and Appeal Board (TTAB) voted to cancel six trademark registrations held by the football team as disparaging to a "substantial composite of Native Americans."[146] On appeal, the district court affirmed the TTAB's decision,[147] and the USPTO canceled the federal registration.[148]

The disparagement bar was at issue again in *Matal v. Tam,* in which an Asian-American electronic dance band sought to register the "THE SLANTS." Finding that the term was widely known as a disparaging reference to people of Asian descent, the USPTO refused to register the mark. The appeal ultimately reached the Supreme Court which unanimously held in favor of Simon Tam. The Court held that "the disparagement clause violates the First Amendment's Free Speech Clause. Contrary to the Government's contention, trademarks are private, not government speech."[149] Following this holding, the Redskins registration was reinstated.[150]

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143 *See* 15 U.S.C. § 1052(a) (2000); Stephen R. Baird, *Moral Intervention in the Trademark Arena: Banning the Registration of Scandalous or Immoral Trademarks*, 83 TRADEMARK REP. 661, 663 (1993). *See also* Rosemary Coombe, *Marking Difference in American Commerce: Trademarks and Alterity at Century's End*, 19 POL. & LEGAL ANTHROPOLOGY REV. 105, 111 (1996).

144 Pro-Football, Inc. v. Harjo, 567 F. Supp. 2d 46 (D.C. Cir. 2008).

145 Blackhorse v. Pro-Football Inc., Cancellation No. 92046185, 2014 TTAB LEXIS 231 (T.T.A.B. 2014).

146 Megan M. Carpenter, *Trademark Law Promotes Fair Competition, Not Morality*, N.Y. TIMES (May 4, 2016, 9:51 AM), https://www.nytimes.com/roomfordebate/2016/05/04/redskins-and-other-troubling-trademarks/trademark-law-promotes-fair-competition-not-morality.

147 Pro-Football, Inc. v. Blackhorse, 112 F. Supp. 3d 429 (E.D. Va. 2015).

148 Harjo v. Pro-Football Inc., 50 U.S.P.Q.2d 1705 (Trademark Tr. & App. Bd. 1999), *rev'd,* 284 F. Supp. 2d 96 (D.D.C. 2003); Pro-Football, Inc. v. Harjo, 415 F.3d 44 (D.C. Cir. 2005).

149 Matal v. Tam, 137 S. Ct. 1744, 1748 (2017).

150 *See* Ned Snow, *Free Speech and Disparaging Trademarks*, B.C. L. REV. 1639 (2016); Simon Tam, *First Amendment, Trademarks, and "The Slants": Our Journey to the Supreme Court*, 12 BUFF. INTELL. PROP. L.J. 1 (2018); Rebecca Tushnet, *The First Amendment Walks into a Bar: Trademark Registration and Free Speech*, 92 NOTRE DAME L. REV. 381 (2016).

While some scholars argued that trademark law should not be used to make moral decisions[151] and that barring registration of trademark on the basis of its content is an unconstitutional violation of free speech,[152] others asserted that trademark registration is a governmental seal of approval that should not be given to racist slurs, particularly where the applicant can protect its mark even without registration.[153] Still other scholars distinguished the Slants case from the Redskins cases and pointed to the differences between reclaiming a racial slur and using it offensively.[154]

The USPTO fought to keep the statutory bar in the Lanham Act so it would not have to put a federal seal of approval on marks that contained racist or sexist slurs. Since it lost that battle, it has a greater incentive to assure its services are provided equitably.

As noted above, trademark registration at the intersection of race, ethnicity and gender, has not been empirically studied. This Article, therefore, wishes to fill this important gap and advance our understanding of how gender, ethnicity and race affect trademark registrants. Our methodology for studying these questions is set forth in the part that follows.

IV. Methodology

In 2010, the USPTO partnered with Google, Inc. to make its data freely available for download.[155] Since the USPTO data became available online in an aggregate format, empirical data on trademark and patent registration in the U.S. has provided a rich foundation for empirical research

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[151] Ashutosh Bhagwat, *Banning Trademarks Called Offensive Violates Free Speech*, N.Y. TIMES (May 4, 2016, 3:21 AM), https://www.nytimes.com/roomfordebate/2016/05/04/redskins-and-other-troubling-trademarks/banning-trademarks-called-offensive-violates-free-speech.

[152] Christine H. Farley, *Trademark Restrictions Permit Free Speech Without Approving Offensive Speech*, N.Y. TIMES (May 4, 2016, 9:52 AM), https://www.nytimes.com/roomfordebate/2016/05/04/redskins-and-other-troubling-trademarks/trademark-restrictions-permit-free-speech-without-approving-offensive-speech.

[153] Sonia Katyal, *Trademark Intersectionality*, 57 UCLA L. REV. 1601, 1689–98 (2010).

[154] Sonia Katyal, *Trademark Officials Must Distinguish Between Irony and Offense*, N.Y. TIMES (May 4, 2016, 3:21 AM), https://www.nytimes.com/roomfordebate/2016/05/04/redskins-and-other-troubling-trademarks/trademark-officials-must-distinguish-between-irony-and-offense.

[155] *Id.*

based on registration data.[156] Each field in an application corresponds with codes. Accessible information includes an individual serial number for each application, the names of applicants, whether the mark has already been used or if the applicant merely intended to begin using it, if the application was submitted pro se or with the assistance of legal counsel and whether the mark advanced to publication and registration.[157]

Our empirical analysis began with this bulk data. Many trademark applications are filed by businesses entities, but a large number are also filed by individuals. In order to analyze demographic information, we initially identified all (1,053,127) applications filed by domestic individuals between 1986 and 2018.[158] As explained in more detail below, we applied models obtained from census data and prior scholarship to quantify the likelihood of the race and gender of the person who submitted each application.

A. Applications

After downloading the USPTO's bulk trademark application data, we narrowed it to applications filed between 1986 and 2018.[159] This dataset includes information for all applications and

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[156] *See* Press Release, U.S. Patent & Trademark Off., *USPTO Teams with Google to Provide Bulk Patent and Trademark Data to the Public* (June 2, 2010), https://www.uspto.gov/about-us/news-updates/uspto-teams-google-provide-bulk-patent-and-trademark-data-public [https://perma.cc/P3BU-K3EM] (describing the origins of the partnership between the USPTO and Google to offer bulk data to the public).

[157] *See USPTO Bulk Downloads: Trademarks*, GOOGLE, http://www.google.com/googlebooks/uspto-trademarks.html [https://perma.cc/WYB3-HMU5] (last visited May 24, 2019); *Bulk Data Products*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/learning-and-resources/bulk-data-products [https://perma.cc/D8VP-7S3X] (last updated Oct. 29, 2018, 7:08 AM).

[158] This data did include additional information (e.g., registration or opposition data) for as late as June 2019. Data from before 1986 was not used because preliminary analysis showed this information to have signs of potentially being incomplete or incorrect.

[159] Trademark Case Files Dataset, U.S. PATENT AND TRADEMARK OFFICE, https://www.uspto.gov/learning-and-resources/electronic-data-products/trademark-case-files-dataset-0.

owners, regardless of the type of applicant (e.g., corporation, individual, etc.), whether the owner was the original applicant or a subsequent assignee, and if the application was foreign or domestic.[160]

We isolated applications filed by individual applicants so that we could quantify average success rates for marks that were not filed by organizational entities. The USPTO assigns each owner of an application an "*owner type code*" to identify if that party is the applicant (code 10) or a subsequent owner. [161] Applicants are likewise given one of 24 "legal entity codes" associated with tax and legal classification of the owner; the code "1" is given to individuals. [162] We kept applications filed by at least one individual applicant (i.e., legal entity code 1 and owner type code 10). Because our demographic data was drawn from U.S. census sources, we next removed from our dataset all applications that were not filed by U.S. citizens.[163]

We then coded these applicants for demographic information. Prior work treated a single author or inventor in a group as a percentage of an entry (i.e., one divided by the total number of authors or inventors).[164] We adopted this approach as it maximizes the percentage of applications for which we have at least some information for the gender and race of applicants. As such, if an

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[160] *See* Graham, S. J. H., G. Hancock, A. Marco, and A. F. Myers, *The USPTO Trademark Case Files Dataset: Descriptions, Lessons, and Insights*, U. S. PATENT AND TRADEMARK OFFICE (2013). Available at http://ssrn.com/abstract=2188621 (describing the scope of the Trademark Case Files Dataset, which we used for this analysis).

[161] STUART GRAHAM, ET AL., *The USPTO Trademark Case Files Dataset: Descriptions, Lessons, and Insights* 55 (2013).

[162] *Id.* at 56. As of 2013, "[a]bout 63.8 percent of all records in owner cite corporation for *legal entity*. Individual owners [code 1] are the second most common but comprise only about 11.8 percent of observations in the data file." *Id.*

[163] Consistent with the practice conducted in other studies, we eliminated any application in which the first listed applicant did not input a U.S. address.

[164] Jensen et al., *supra* note 66, at 307 ("Because most applications listed multiple inventors, we calculated a 'proportion women' variable: the number of women inventors divided by the total number of inventors on each application."). The literature has, however, also coded an application as having the attributes of the first listed inventor or author. Juan Alcácer & Wilbur Chung, *Location Strategies and Knowledge Spillovers*, 53 MANAGEMENT SCIENCE 760, 767 (2007) (characterizing a patent as being filed by an applicant from wherever the first inventor lives, regardless of where other applicants are from).

application was filed by one man and one woman, it was coded as being 50% female and 50% male.[165] Identification of applicants' gender and race information is described below.

B. Race

To analyze application trends and success rates by race, racial information was identified from the individual's name. We employed data correlating names with the likelihood that an individual identifies as a particular race. These datasets associated individuals with the likelihood that they identify as White, Black, Asian/Native Hawaiian/Pacific Islander ("Asian"), or Hispanic/Latino ("Hispanic").[166] In making these categorizations, we employ a taxonomy presented by the U.S. Census Bureau[167] which was used in prior work.[168]

Racial information was initially gleaned from the applicant's first name and Konstantinos Tzioumis's *Demographic Aspects of First Names*.[169] In that article, Tzioumis presents probabilities that over 4,000 given names are associated with a certain race through information ascertained from

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[165] Likewise, if an application was associated with two individuals who were coded as 25% likely to be Hispanic and 75% likely to be Hispanic, the application was coded as 50% likely to be Hispanic.

[166] The 2000 Census does not treat Hispanic as a race; it received its own question asking if the individual was Hispanic and then was followed by a race question which didn't include Hispanic as a race. U.S. Department of Commerce Bureau of the Census, United States Census 2000 (see questions 5 and 6 under "Person 1" on page 3), https://www.census.gov/dmd/www/pdf/d02p.pdf. As such, an individual could identify as both Hispanic and white/black/Asian/etc. To account for this, "race data in this analysis is constructed so that any person identified as Hispanic is placed in that classification, regardless of reported race [and] race identification is used only for those persons who are not Hispanic." DAVID L. WORD ET AL., DEMOGRAPHIC ASPECTS OF SURNAMES FROM CENSUS 2000, at 4, https://www2.census.gov/topics/genealogy/2000surnames/surnames.pdf. Note that instances where the percent of people with a particular last name were omitted due to privacy concerns were treated as a zero.

[167] *See* JOSHUA COMENETZ, FREQUENTLY OCCURRING SURNAMES IN THE 2010 CENSUS (Oct. 2016), https://www2.census.gov/topics/genealogy/2010surnames/surnames.pdf. The Census Bureau also allows respondents to identify as multi-racial or American Indian/Alaska Native, but there were insufficient applicants identified in these categories to warrant analysis. Accordingly, the classification is not accounted for in our final results.

[168] Robert Brauneis, Dotan Oliar, *An Empirical Study of the Race, Ethnicity, Gender, and Age of Copyright Registrants*, 86 GEO. WASH. L. REV. 46, 59 (2018) (using a "governmental six-category taxonomy").

[169] Konstantinos Tzioumis, *Demographic Aspects of First Names*, 5 SCI. Data 180025 (2018).

applicant-reported data in domestic mortgage filings.[170] That article used the same racial taxonomy as the U.S. Census.[171]

Certain first names are highly specific to one race; *Yang* was almost exclusively associated with Asian applicants (99.2%).[172] In contrast, other names are multi-racial. A person with the name *Malik* is 40.0% likely to be White, 2.9% Hispanic, 34.3% Black, and 22.9% Asian.[173] All applicants in our dataset were coded with a percent likelihood that their first name was associated with each race.[174]

The U.S. census bureau employed information from the 2000 Census to create a database associating over 160,000 surnames with the probability an individual identifies as a particular race.[175] We used this information to code each applicant with a probability that they identify as a particular race, as per their last name. For example, an applicant with the second most common last name (Johnson) is 61.6% likely to be White, 33.8% Black, 0.4% Asian, 0.9% American Indian, and 1.5% Hispanic.[176]

Using first and last name racial associations, we assigned each applicant an aggregate racial probability. Where data was available for both the first and last name, the probabilities were averaged.

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[170] *Id.* Note that self-reporting of racial or ethnic data is accepted in the literature. *See* Office of Management & Budget, Recommendations from the Interagency Committee for the Review of the Racial and Ethnic Standards to the Office of Management and Budget Concerning Changes to the Standards for the Classification of Federal Data on Race and Ethnicity, Fed. Reg., 7/9/97, Billing Code 3110-01, Part II, 36873-36946 (1997); CHERYL ULMER ET AL., RACE, ETHNICITY, AND LANGUAGE DATA: STANDARDIZATION FOR HEALTH CARE QUALITY IMPROVEMENT, INST. MED. NAT'L ACAD. (2009).

[171] *Id.*

[172] Tzioumis, *supra* note 169.

[173] Tzioumis, *supra* note 169. This name was not (0%) associated with being multi-racial or American Indian.

[174] If a name did not appear in the dataset, the corresponding cell was coded as null. Additionally, if the first name was presented as an initial, the initial was disregarded and the middle name was analyzed. Otherwise, middle names were disregarded.

[175] U.S. CENSUS BUREAU FREQUENTLY OCCURRING SURNAMES FROM THE 2010 CENSUS, https://www.census.gov/topics/population/genealogy/data/2010_surnames.html. (using File "B: Surnames Occurring 100 or more times" linked to at bottom of page); Comenetz, *supra* note 167. Only surnames occurring at least 100 times in the census were included.

[176] Johnson is also associated with multi-racial people 1.8% of the time.

Where either name was not found in the relevant database, the applicant was coded as having the demographics associated with the first or last name for which data was available.

For example, Maurice Q. Gray would be considered 67.5% white, 27.5% black, .1% Asian, and 2.5% Hispanic by averaging the associations for his first and last names, with data for his middle initial being ignored. For a person named Maurice Q. Skywalker, their racial profile would be equal to that of their first name (64% white, 31% black, 2% Asian, and 4% Hispanic) due to the fact that the uncommon last name "Skywalker" does not appear in the relevant database. This approach allowed identifying race for 95.0% of all applicants and for at least one applicant in 96.9% of applications.

Our methodology accounted for applications filed by more than one claimant. For example, if an application was filed by one white individual and one black individual, the data for that application would be counted as half of a white applicant and half of a black applicant. However, applications were only coded with racial information if data reflective of race was available for at least one applicant (e.g., someone with the name *saldjfdfj* would not have race data).

The number of applications for which no race data is available is rising, up to 4.2% in 2018 from 1.6% in 1986. This trend might reflect an additional increase of "uncommon" or "foreign" sounding names. It is possible that many of these individuals are not white, but the data does not wholly support this conclusion. For example in 2018, out of 2,385 last names with no race data, the top 10 were: *[no entry]* (64 entries), *robert mcferrin* (27), ketchin (19), bonnardel (17), *charles runels* (17), chandani (16), sergey (15), teuk (15), margaliot (15), and petit-compere (12), with the italicized entries likely indicating some sort of mis-entry.

C. Gender

We identified applicant gender using information from Martinez, Raffo, and Saito's *Identifying the Gender of PCT Inventors*.[177] To determine a patent applicant's gender from applications in multiple countries, they produced a gender-name dictionary correlating an expected gender with the individual's first name and country of residence.[178] Because our analysis evaluates domestic applicants, we coded each individual with a binary gender by comparing their first name (or middle name if only given a first initial) with U.S. data from *Martinez, Raffo, and Saito*.

This method maximizes the percentage of applicants coded for gender. While such an approach loses nuance for gender ambiguous names like Riley (considered male) and Avery (no gender associated), it provides data for the substantial majority of individuals. This approach allowed identifying gender for 88.8% of all applicants and for at least one applicant in 93.3% of applications.

A later section of our study necessitated identification of applicants with names that appear to be androgynous to the average trademark examiner. To do so, we had to break applicants into those with common (gender obvious) names and those with rare, but gender-specific, names whose gender would not be obvious because examiners are not familiar with the name. Thus, we identified whether an applicant's name was common by comparing applicants' first names to the Social Security Administration's top 1,000 boy and girl names for the years 1901-2000. Names are considered common (and thus, gender identifying) if included in this list. This approach complies with methodologies previously used in the literature.[179]

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[177] Gema Lax Martinez et al., Identifying the Gender of PCT Inventors, Working Paper at 6 (Nov. 2016), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_econstat_wp_33.pdf

[178] *Id.*

[179] *See*, *e.g.*, Schuster, et al., *supra* note 72.

D. Other Data

Beyond demographic information associated with individual applications, we collected the identities of trademark examiners and applicants' attorneys associated with each application. Consistent with the approach described above, demographic data was assigned for these individuals. Attorneys' experience was also collected. For each application, we ascertained the number of applications filed by that attorney at the time of filing.[180]

Application-specific result data was also collected. We coded each entry for when (and whether) it was filed, published, opposed,[181] and registered. Applications were also identified as either an intent-to-use or use-based application.

V. Empirical Analysis

One may reasonably hypothesize that race and gender do not correlate with success before the USPTO, and start an analysis with the null hypothesis that race and gender have no effect on success in prosecuting trademarks. From that premise, it could be theorized that the percentage of each race and gender group who succeed in prosecuting trademarks would match that group's percentage of the U.S. population. This theory would be premised on the observation that there is no obvious reason why the percentage of women, for example, who file and succeed in trademark prosecution would not match the number of women in the U.S. population.

Alternatively, one might theorize that the USPTO application and success rates for each group would present patterns similar to those that were revealed in the patent and copyright studies noted

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[180] To do this, we matched the exact name of the attorney. This approach may undercount relevant applications if the attorney changed how they list their name (e.g., starts listing a middle initial) but avoids issues where two attorneys' share first and last names but one includes a differentiating name detail (e.g. a middle initial) that can be used to distinguish them.

[181] An application was deemed to have been opposed if it was coded with the USPTO's "OP.I" code for "OPPOSITION INSTITUTED NO. 999999."

above, namely that women and minorities would be systematically underrepresented vis a vis their presence in the population. The patent literature showed greater disparities than the copyright literature, and given that trademark applications fall closer to copyrights in terms of cost, expense and difficulty of obtaining registration, one might expect the trademark data to fall somewhere between copyright and patent data in the degree to which minorities are underrepresented. This theory could be based on the idea that access to capital is less available to women and minorities or that there may be some institutional governmental bias that disproportionately presents obstacles to women and minorities who seek to protect intellectual property rights. According to this alternative hypothesis, the success rates before the trademark side of the USPTO would fall somewhere between women and minority success rates before the patent side of the USPTO and before the copyright side of the United States Copyright Office. The following analysis shows that neither hypothesis explains all of the data. Instead, trademark law provides its own nuanced and unique landscape, especially with respect to gender.

In contrast to other fields of intellectual property, we find that trademark applicants who are women succeed at a higher rate than men in securing registrations before the USPTO. Also, in contrast to earlier work, no evidence supports institutional bias against women or minorities. The data does, however, reflect disparate success rates for several minority populations. Our specific findings are as follows.

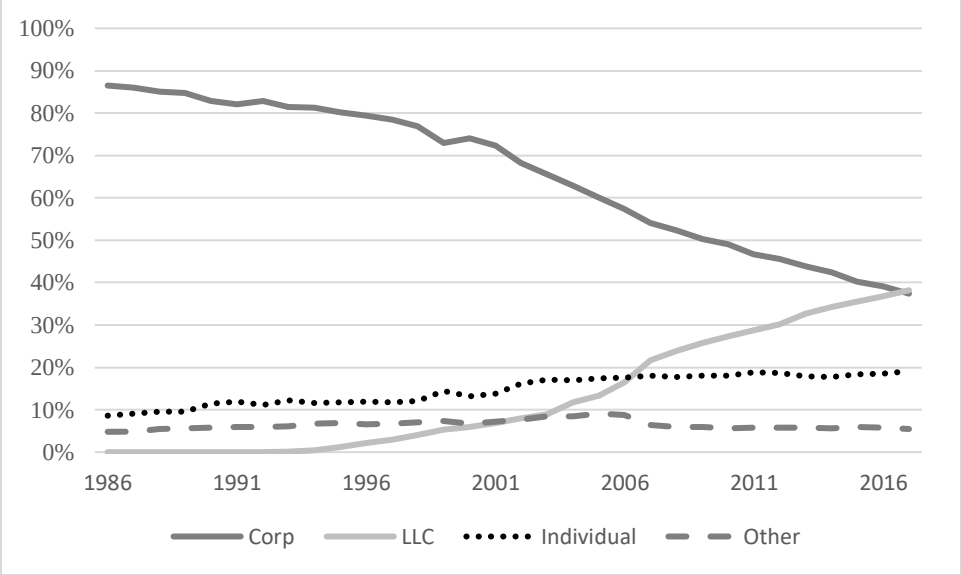
A. Descriptive Results

Before focusing on the set of trademark applications filed by individuals, it is important to note that the majority of trademark applications are filed by organizational entities.[182] As such, our

[182] The effects of race and gender on corporate applications are beyond the scope of this study. Insights on this topic may be found through consideration of the race and gender of the applicant's leadership at the

study captures only one part of the trademark landscape, as corporate applicants don't have inherent race or gender. Before turning to focus on individual applicants, we begin by situating them in the larger picture regarding people who file applications through corporate entities. Figure I shows the relative percentages of U.S. trademark applications filed by domestic individuals, corporations, and limited liability companies between 1986 and 2017. The solid lines depict organizational entities with the darker grey reflecting corporations and the lighter grey reflecting limited liability companies. The dotted line represents individual applicants. The dashed line represents applications filed by a variety of other entity types including, partnerships, limited partnerships, trusts, estates, and joint ventures.

Figure I: Percentage of U.S. Trademark Applications by Entity Type

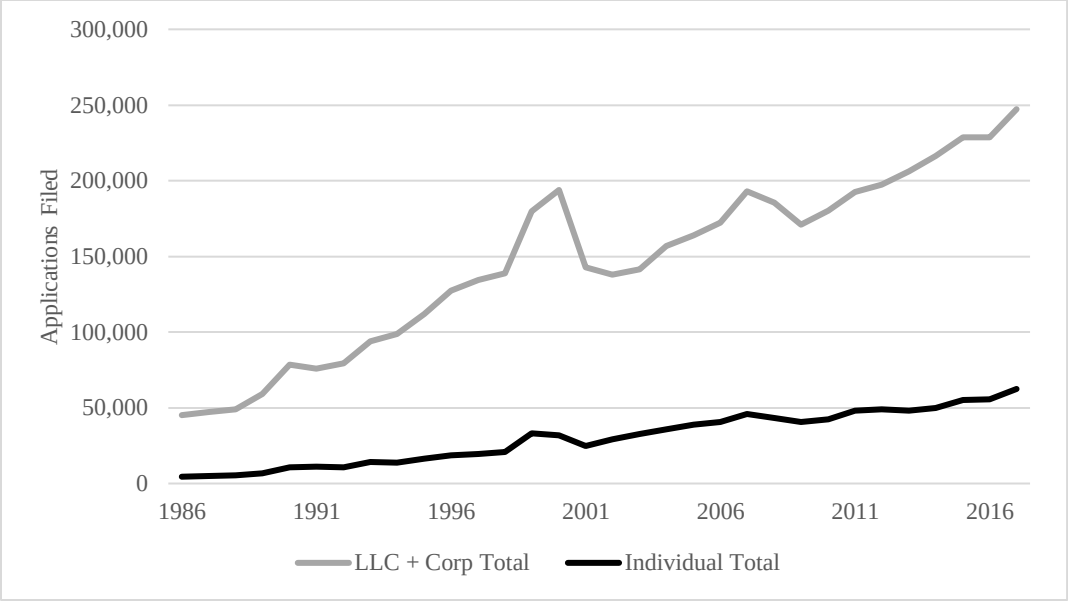


time each application was filed. Studying the gender and race of the applicant' counsel and the examiners who review each file may also yield interesting results. This topic would be fertile ground for future research and would provide interesting points of comparison with the findings described here.

The most dramatic increase reflected in Table I is seen in the number of applications filed by limited liability companies. A near mirror image of that trend can be seen in the simultaneous decrease in the number of corporations not organized as LLC's. In contrast, the percentage of trademark applications filed by individuals represents its own pattern, increasing, albeit less dramatically, over the past three decades. In 1986, only 8.6% of all applications were filed by individuals. The percentage rose steadily to 17% in 2003, and since then has hovered between 16-18% through 2018.

Because Figure I shows applications in percentages, it may lead one to conclude that the number of trademark applications has held steady. In fact, the data reflect a dramatic increase in the total number of trademark applications filed annually in aggregate and by individuals. To show this trend as well as an explanation of how combined corporate filings compare to those of individuals, Figure II displays LLC and corporate applications together, and instead of showing the results by percentages, depicts the number of applications that have been filed each year. Accordingly, Figure II shows that the quantity of both domestic individual and corporate applications have been steadily increasing.

Figure II: Three Decades of Corporate and Individual Trademark Applications



In 1986, 52,214 trademark applications were filed with the USPTO, and only 4,490 of those were submitted by individuals. By 2018, 337,689 were filed overall, and 64,836 of them were filed by individuals.[183] In three decades, the annual number of trademark applications filed by corporations had increased by a multiplier of 5, rising from 47,398 to 254,955 in 2018. At the same time, the number of applications filed by individuals increased by a multiplier of 14.

The entire pool of domestic trademark applications filed between 1986 and 2017 amounts to 6,370,829 separate files. Of this aggregate number, 1,053,127 applications were filed by individuals. While individual applications constitute only 16.5% of the entire trademark application pool over the past three decades, we are nonetheless able to conduct our analysis on all applications filed by individuals, giving our study a robust number of applications to examine. After identifying the entire set of trademark applications filed by individuals, we broke that data down further to see how gender and race correlated with success in the trademark registration process.

[183] Note that for current purposes an application was considered a single application, even if it sought protection in multiple classes of goods and services.

1. Race and Trademark Applications

From the population of applications filed by domestic individuals, we next determined the extent to which different racial groups filed trademark applications. If all races filed trademark applications at the same rate, one would expect the percentage of trademark applications to match each group's percentage of the U.S. population.

To get an idea of the trademark activities for each race, the percentage of trademark applications from that race must be compared to its percentage in the overall population. For example, white applicants filed 82.79% of the applications in 1999, but only represent 69.78% of the overall population, such that they are overrepresented in the population of trademark applicants for that year. Specifically, they are overrepresented by 19% (82.79% / 69.78% = 1.19). Both variables change each year. During the thirty-year period we examine, the population of the U.S. has changed substantially. Census data reflect a decrease in the percentage of residents identifying as white.

We accomplished the comparison by showing the racial percentages of trademark applications over time and comparing those percentages to census data. Initially, we obtained data of census percentages from 1980, 1990, 2000,[184] 2010,[185] and an estimate of 2018.[186] Changes in the population were estimated to occur at a linear pace between census dates, so that racial breakdowns could be quantified for each year. For example, the Hispanic population increased from 7.97% in 1990 to 12.55% in 2000; from this we estimate the Hispanic population in 1995 as 10.77% (i.e., half-way between the 1990 and 2000 percentages).

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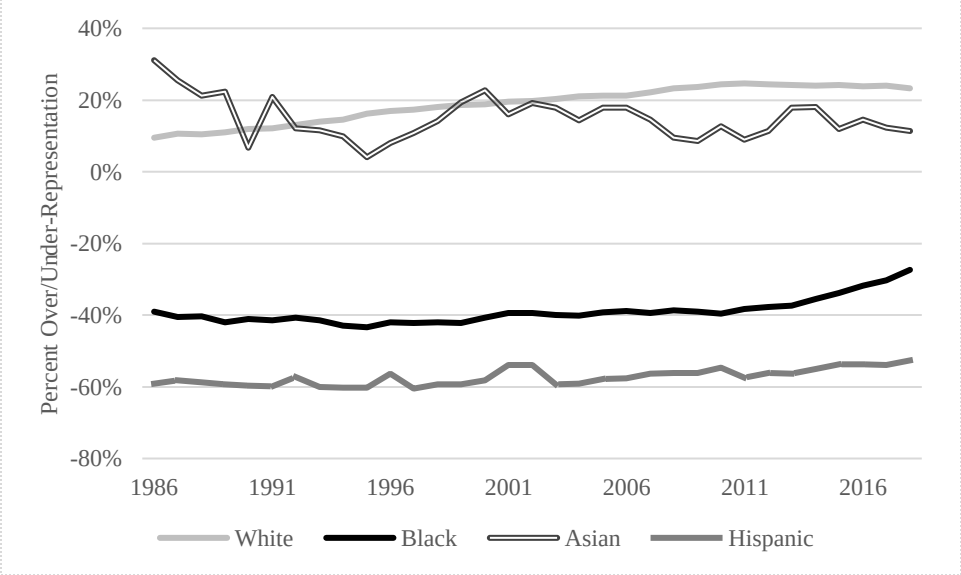
[184] *Population by Race*, CENSUSSCOPE.ORG, http://www.censusscope.org/us/chart_race.html

[185] *Modified Race Data 2010*, U.S. CENSUS BUREAU, https://www.census.gov/data/datasets/2010/demo/popest/modified-race-data-2010.html

[186] *Quick Facts United States*, U.S. CENSUS BUREAU, https://www.census.gov/quickfacts/fact/table/US/PST045218

Figure III shows the ratio of trademark applications filed by each racial group relative to that group's percentage of the U.S. population in that year. If, for example, the percentage of Asian trademark applicants matched the percentage of Asians in the U.S. population in any year, the data point for that year would rest on the "0" line, depicting no difference. Any line above "0" indicates that group's overrepresentation percentage. A data point on the 15% line (reflecting, for example, white application in 1994 and Asian applications in 2016) shows that in that year, the group's trademark applications exceeded the group's percentage of the population by 15%. Similarly, a data point below the 0 line shows an underrepresentation of applications compared to the population by the percentage indicated. An upward trend moving from left to right indicates that the group has increased their filings relative to their percentage of the U.S. population over time.

Figure III: Ratio of Trademark Applications to Percentage of Population by Race



The top two lines show that white and Asian applicants are overrepresented within this population, while the bottom two lines indicate that black and Hispanic applicants are underrepresented. The percentage of white applicants has decreased by approximately 11% during the

thirty-year period we examined but given disparate racial population trending (with the white population growing at a lower rate than the non-white population), the relative percent of white applicants has increased from a 9% overrepresentation in 1986 to a 23% overrepresentation in 2018. Blacks are underrepresented in the pool of trademark applicants throughout these three decades, but the relative representation of black applicants has increased significantly. In 1986 the number of black applicants constituted 39% less than their percentage of the population. That underrepresentation holds constant until 2010 when the black line begins to move up showing increases in trademark applications compared to population trends. By 2018, the black line has moved up to 27%, showing that African-Americans are filing more trademarks and are steadily closing the underrepresentation gap. Asian applications were overrepresented during the entire period, but as the double line illustrates, their overrepresentation decreased from 31% in 1986 to 11% in 2018. The greatest level of underrepresentation, depicted by the dashed line, remained constant among Hispanic applicants, but this group also showed significant progress in diminishing its underrepresentation from 59% in 1986 to 53% in 2018.

Once all these applications were filed, the aggregate publication and registration rates did not reflect racial differences in success. Between 1986-2018, the publication rates were 69.16% (white), 68.66% (black), 67.85 (Hispanic) and 67.07 (Asian). The registration rates (1986-2015) were 47.07% (white), 45.68% (black), 45.30 (Hispanic) and 46.95 (Asian). The non-white applications that published increased from 15.2% in 1986 to 25.4% in 2018,[187] and the percentage of non-white applications that registered increased from 15.1% in 1986 to 23.3% for 2015.[188] Across the 1986-2015 timeframe,

[187] Among published applications filed in 2015, 23.3% of individual applications were non-white.

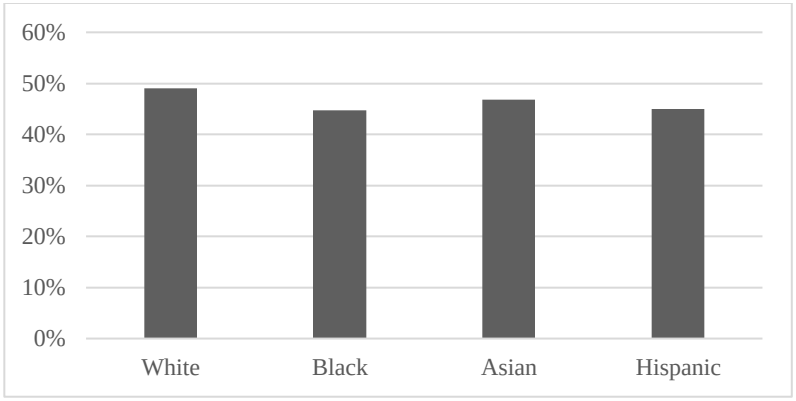
[188] 2015 was selected as an end point to allow sufficient time for most applications to go abandoned or be registered.

domestic corporate or LLC applications were registered at a rate of 58.28% and the publication rate was 76.35% (1985-2018).

The uniform disparity between registration and publication rates is consistent with other empirical trademark studies showing registration rates that are significantly lower than publication rates because many intent-to-use trademark applications are dropped for business reasons and not due to flaws in the application or other procedural issues. No obvious trend is apparent with regard to the year to year relationship among these groupings. Statistical significance of these deviations is addressed in the regression analysis below.

Given prior work indicating that the presence of counsel is correlated with higher success rates in trademark prosecution,[189] we examined whether applicants of certain races were more or less likely to have their marks filed by a lawyer. Figure IV depicts the representation rates for each racial group.[190]

Figure IV: Percentage of Applications Filed by an Attorney by Race of Applicant



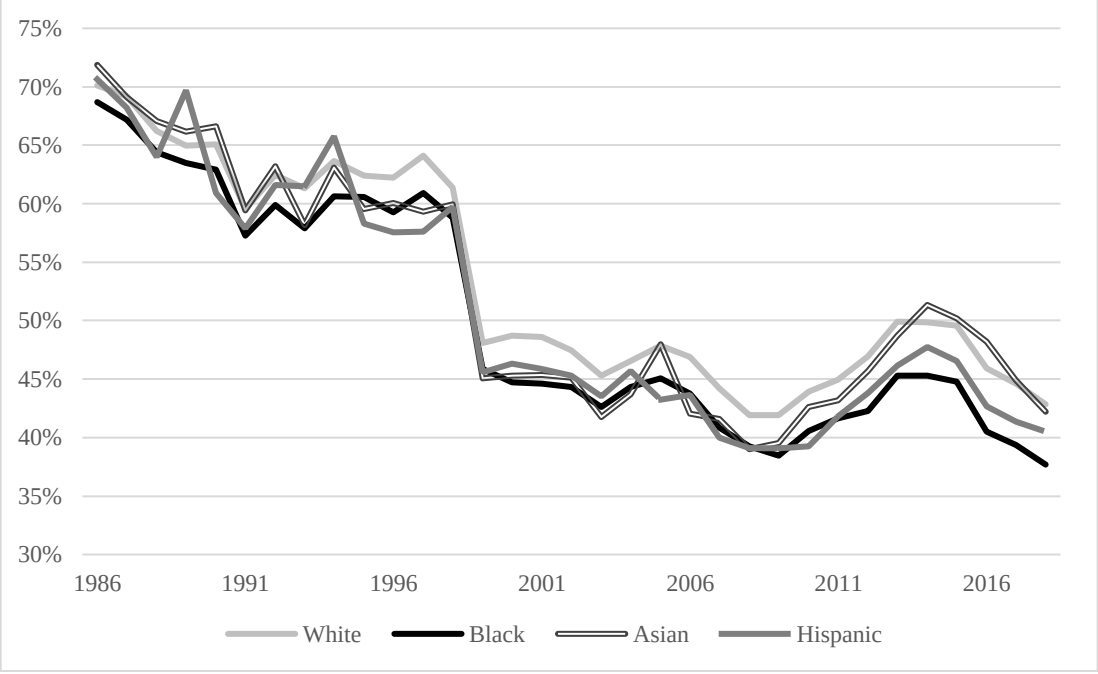
[189] Gerhardt McClanahan, *supra* note 38, at 620.

[190] Consistent with the balance of the article, for purposes of Figure IV and V, one application may be allocated as being filed by different races depending on the individual filer's name.

The percentage of applicants represented by counsel is never more than 50% for any group of individual applicants, and it ranges from 45% for Hispanic and blacks, 47% for Asians and 50% for whites. While these percentages show only modest differences, we also examined representation percentage over time to determine whether the data reveal any noteworthy trends.

Figure V depicts the percent of individual applicants represented by an attorney by race over time. Overall, the percentage of applications filed by legal counsel has plummeted from 70.2% in 1986 to 42.1% in 2018. All applicant groups demonstrate some consistency in that they are filing with the assistance of counsel less frequently. The most dramatic drop in the presence of counsel occurred after October 1998 when the USPTO first made it possible to file applications online.[191]

Figure V: Percentage of Applications Filed by an Attorney by Race of Applicant



[191] A PATENT AND TRADEMARK OFFICE REVIEW: FISCAL YEAR 1998 at 22, UNITED STATES. PATENT AND TRADEMARK OFFICE ("In October 1998, we expanded the pilot to make Internet filing available to all customers.").

Figure V demonstrates that white and Asian applicants are demonstrably more likely to prosecute trademarks with the assistance of counsel, and that Blacks and Latinx applicants are less likely. However, the percentages exhibit quite a bit of fluctuation from year to year. For example, Asian applicants were the most likely to file pro se in 2003 and the least likely, just two years later, in 2005. Given the general pattern of noteworthy differences but with apparent fluctuation along the way, our regression models will test whether race and the presence of counsel are variables that exert a statistically significant impact on success rates in prosecuting trademarks before the USPTO.

There is, however, one additional manner to quantify diversity in a single annual measure. To this end, we employ the Herfindahl-Hirschman Index ("HHI"). This measure originated as a measure to quantify market concentration,[192] but has previously been utilized to measure racial diversity in economic literature.[193] The index is calculated by summing the squares of the market share of each firm in the market.[194] For example, if there are four firms with market shares of 10%, 20%, 30%, and 40%, the HHI would be equal to 3,000 ($10^2 + 20^2 + 30^2 + 40^2$). The higher the HHI, the more concentrated the market is;[195] a perfectly concentrated market (only one firm) would have an HHI of 10,000 (100^2). The benefit of HHI utilization is that it assesses the aggregate diversity of an entire population in a given year, as opposed to presenting multiple discrete attributes of a population (e.g., 25% Hispanic, 25% black, etc.).

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[192] Matthew I. Danzig, *China's New Guidelines on the Assessment of the Effect of the Concentration of Business Operators on Competition*, 2011 CURRENTS: INT'L TRADE L.J. at 24, 27.

[193] Jessica B. Weiss & Paul M. Sommers, *Does Team Racial Composition Affect Team Performance in the NBA?* At l 37 Econ J. 119, 119 (2009) (measuring racial diversity among NBA players among five categories); Jennifer Patrice Sims, Whitney Laster Pirtle & Iris Johnson-Arnold, *Doing hair, doing race: the influence of hairstyle on racial perception across the US,* 2019 ETHNIC AND RACIAL STUDIES 7.

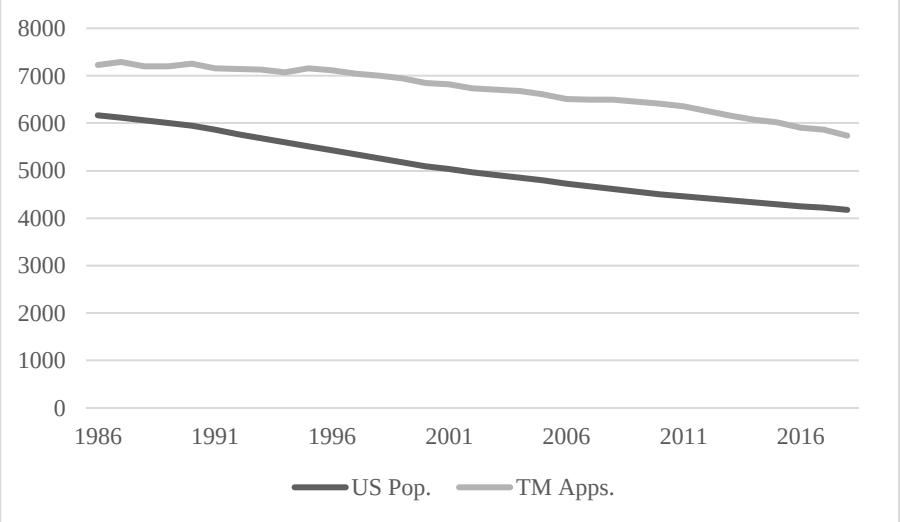
[194] Matthew I. Danzig, *China's New Guidelines on the Assessment of the Effect of the Concentration of Business Operators on Competition*, CURRENTS: INT'L TRADE L.J., Winter 2011, at 24, 27.

[195] Jon Fougner, *Antitrust Enforcement in Private Equity: Target, Bidder, and Club Sizes Should Matter*, 31 YALE J. ON REG. ONLINE 25, 30 n.27 (2013).

For current purposes, the index is calculated by squaring the percent of the U.S.' population identifying as part of each racial group. For instance, a U.S. Census Bureau estimate of the 2018 population finds a HHI of 4175 (60.4% white, 12.5% black, 5.7% Asian, 0.7% American Indian, 2.2% multi-racial, 18.3% Hispanic).[196] Comparing this to the HHI for the year 2000 (the first year multi-racial data was reported) of 5,098 shows an increase in overall diversity (i.e., a drop in HHI) over that 18 year period.[197]

Figure VI uses the HHI metric to show that the U.S. population[198] has increased in racial diversity faster than the increase in racial diversity among trademark applicants. The disparity peaked in the year 2010 (an HHI difference of 1,905) and has slowly begun to converge to 2018. The disparity remains, however, more substantial than it was in 1986.

Figure VI: Racial HHI by Year



[196] https://www.census.gov/quickfacts/fact/table/US/PST045218

[197] http://www.censusscope.org/us/chart_race.html (2000 was chosen here for a 1:1 comparison, as it is the first year to include multi-racial as a category).

[198] Note that the racial demographics of the US population was taken from the decennial census, with the racial breakdown of years between censuses linearly estimated therefrom.

Figures VII and VIII separate out the HHI by international class. Each trademark application is filed for particular goods and services.[199] Therefore, the following two charts show a rough approximation of industry categories that are more or less diverse.

Figure VII: Racial HHI by International TM Class in 2017

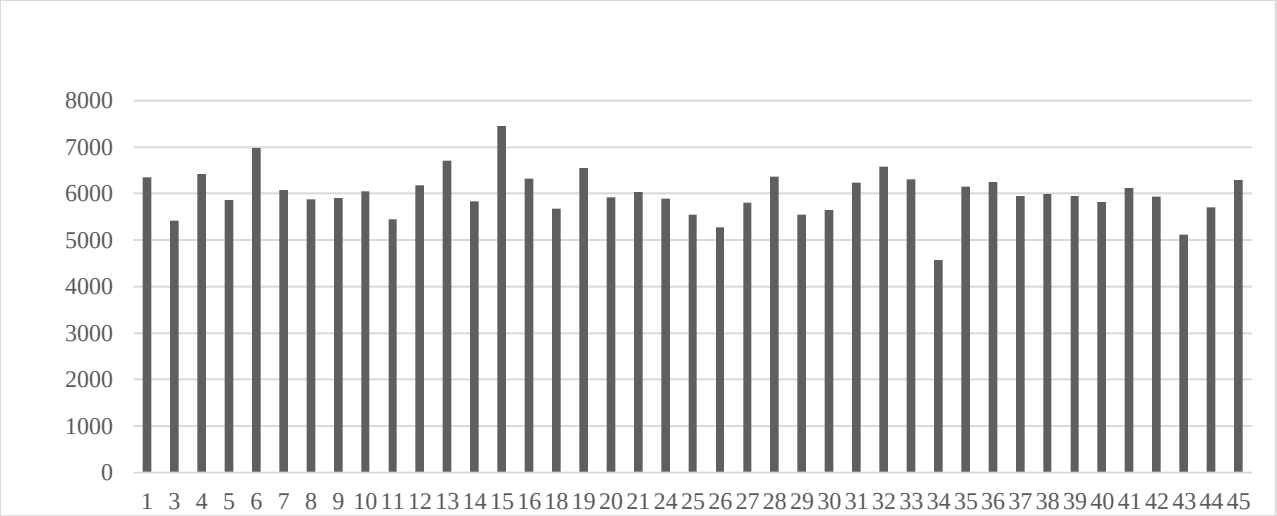


Figure VII, depicting the HHI for applications in each class filed in 2017, shows that classes 34 (Smokers' articles - 438 filings, 4569 HHI) and 43 (Hotels and Restaurants - 2130 filing, 5123 HHI) were the most diverse. Classes 15 (Musical Instruments - 157 filings, 7454 HHI) and 6 (Metal goods - 254 filings, 6981 HHI) were the least diverse. The finding for Class 15 was particularly interesting given the predominance of black and Latinx authors in copyrighted musical works.[200]

Figure VIII: Racial HHI by International TM Class (1986 - 2018)

[199] For a complete list of categories, see: https://www.oppedahl.com/trademarks/tmclasses.htm

[200] *Id.* at 63.

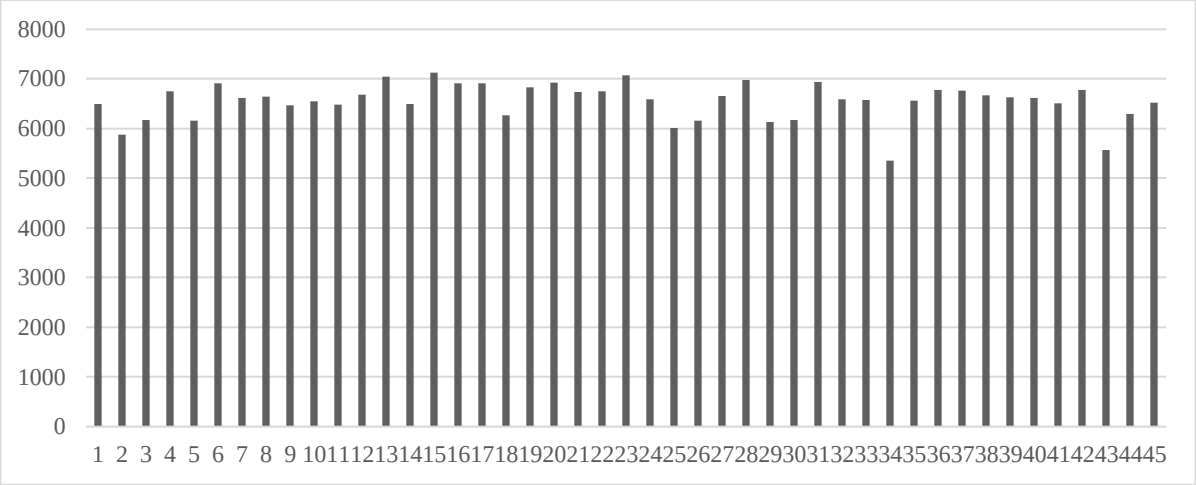


Figure VIII aggregates the HHI data by class from 1986-2018. Consistent with the snapshot depicted in Figure V (for 2017), we see that classes 34 and 43 are the most diverse. In this larger dataset, class 15 remains the least diverse.

With regard to oppositions, the rate of opposition for published applications was largely consistent among applicants of different races. Across the cadre, opposition rate were: white (3.02%), black (3.00%), Hispanic (3.24%) and Asian (3.46%). These rates are further explored in the regression analysis section.

2. Gender and Trademark Applications

Unlike data about race, the U.S. census data on gender has remained rather stable since 1980, with women forming a slight majority over men. For the entire time period in our study, women accounted for 51% of the U.S. population.[201] Although some U.S. citizens do not identify comfortably with one binary gender description, the census continues in 2020, as it has in past years, to ask that all

[201] Women made up 51.3% of the U.S. population in 1990, 50.9% in 2000 and 50.8% in 2010. *Gender 2000,* U.S. CENSUS BUREAU, https://www2.census.gov/library/publications/decennial/2000/briefs/c2kbr01-09.pdf; *Age and Sex Composition: 2010*, U.S. CENSUS BUREAU, https://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf

persons identify as either male or female.[202] Because our study relies on census data to sort applicants by gender, our work does not account for a more nuanced view of gender that may be explored in future work.

As with race, one might theorize that individual trademark applications filed by women would track their percentage in the U.S. population. The data unequivocally disprove that theory. In 1986, 23.7% of domestic, individual applicants for whom gender data was available were filed by women.[203] Over time, the gender disparity dissipated somewhat. The percentage of female applicants rose to 32.1% by 2018.

Pursuant to the methodology explained above, for gender identification, we counted only applications if the gender of at least one applicant could be identified. Therefore, our study excludes some applications for each year, amounting to 5.1% of the 1986 applications and rising to 8.9% of the 2018 applications. Some of the applications were discarded because the names were not common enough to yield a reliable gender identification percentage. Other applications were discarded because the first names of the applicants were gender neutral and could therefore yield no information about gender differences.[204] For the vast majority of applications which did yield gender identifying information, Figure VII displays the percentage of applicants filed by men over time.

Figure IX: Percentage of Applicants that are Male by Application

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[202] *The National LGBTQ Task Force's Guide to the 2020 Census: An Introduction*, NATIONAL LBBTQ TASK FORCE, https://www.thetaskforce.org/wp-content/uploads/2019/05/Guide-to-the-2020-Census-An-Introduction.pdf

[203] The percentage of applications without any gender data hover at about 4% for the balance of the 1980s.

[204] For example, in 2018, out of the 3,549 individual applicants with no gender data, 1,839 had no last name entered, the rest of the top 10 were gender-neutral: Kyle (288 entries), Jordan (215), Taylor (143), Tracy (131), Jamie (124), Robin (121), Casey (120), Leslie (111), and Jaime (87).

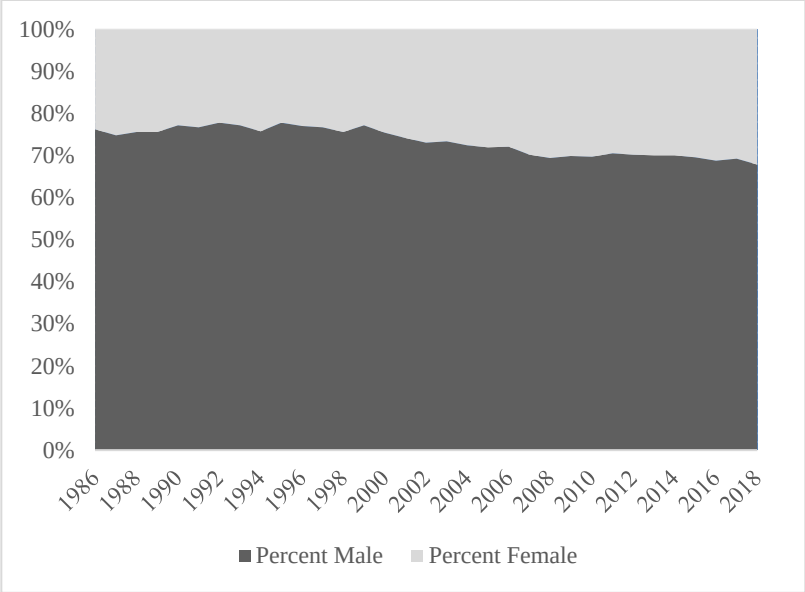


Figure IXA: Percentage of Applicants that are Male by Application, Zoomed In

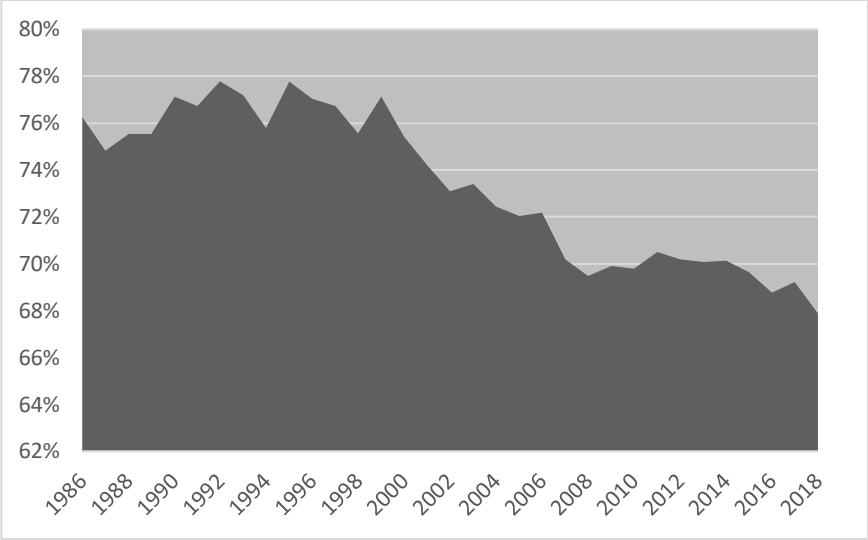
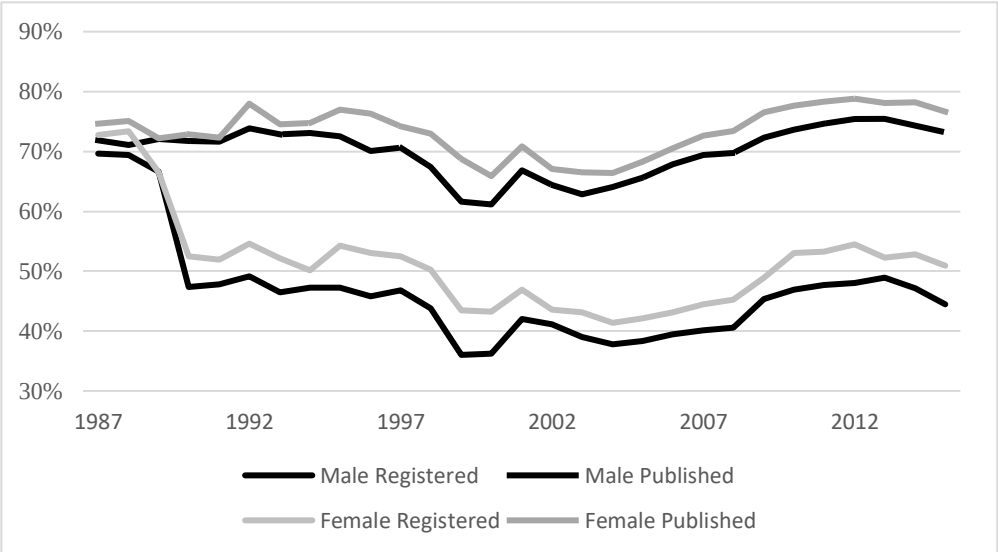


Figure IX demonstrates that men have filed many more trademark applications than women since 1986. Male applicants are represented by the darker field, and women by the lighter field. Figure IXA represents the same data but zooms into the 62-80% range so that differences are more apparent. The trend over the thirty-year period reflects a clear majority of male applicants for the entire period; however, the magnitude has been diminishing over time. The data demonstrates a constant moderate

decline in the number of male trademark filings over the years from more than 75% to less than 68% of applications. From 1986 to 2000, men filed 3 out of every 4 applications. In 2001, the percentage of male applicants dipped below the 75% line for the first time. The percentage of male filers dipped below 70% in 2008 and hit its lowest point of 68% in 2018. Although a greater percentage of women are filing trademark applications than ever before, men still file significantly more trademark applications than women.[205]

Figure X depicts the success rates of male and female domestic trademark applicants. The grey dotted line shows the publication success rate for women, and the grey solid line shows their registration rate. Similarly, the black dotted line depicts the male publication rate, while the black solid line depicts the male registration rate.

Figure X: Publication and Registration Rates Over Time by Gender



[205] This does not consider applications filed by men or women through business entities, as applications filed by non-individuals were not included in our dataset. This may warrant future research.

Figure X depicts one of the most significant findings of our research. As noted above, the percentage of women who file trademarks is substantially lower than men. When women do seek to protect their trademarks by applying to register marks with the USPTO, two significant metrics indicate that they succeed more frequently than their male peers.

In prosecuting a trademark application, the first measure of success is publication, marking the moment when the USPTO approves the application. Because 2/3 of applicants must overcome at least one pre-publication office action, the publication date is a significant moment because it indicates that all such barriers have been overcome. Over the entire 30-year time period, there was not a single year in which the percentage of male applicants whose marks published exceeded the percentage of successful women. The difference in success rate fluctuated between .11% (1989) and 7.12% (1999), with the annual difference averaging to 3.35%.

Many marks are filed based on previous use and proceed to registration almost automatically. Publication opens a 30-day window when a small number of marks may be opposed by parties. Only approximately 3% of marks are subject to such challenges, and therefore, marks that were already published in general proceed directly to registration soon after the publication window closes.

However, as Figure X indicates, the publication rates are noticeably higher than the registration rates, especially after 1989 when the publication and registration diverge dramatically. The reason for this difference results from a change to trademark registration practices in 1989 which created the possibility for applicants to seek registration based on a good faith intent to use a mark. For marks based on an intent to use, after publication, a notice of allowance issues, opening a 6-month time period in which the applicant may file a statement indicating that it has begun using the mark in commerce.

To assure that these significant findings would not be skewed by close approximations, the data in Figure X includes only individual applicants for which our methodology indicated the applicant was 100% female or male.

Figure X shows a similar pattern for registration rates. Again, women succeeded more than men, although men did succeed in registering .11% more of their marks than women in 1989, at a male rate of 66.64% compared to the women's success rate of 66.53% that year. However, overall 51.26% of marks filed by women proceeded to register compared to 46.44% of marks filed by men. On average, women succeeded in registering their marks 4.82% more frequently than men.

Explanations for the findings in Figure X will be a fertile ground for future research. We begin that work in the next section by running a regression to determine the degree to which the differences apparent in Figure X are statistically significant. Many possible explanations could be tested to determine the reasons for this difference. Some theories worth testing may consider gender differences in risk aversion, application quality (e.g. likelihood the applied-for mark will be confused with a senior mark), or access to capital, among others.

Because prior research shows that applications filed by an experienced counsel are being published and registered more frequently, we checked whether this difference may correlate with the presence of counsel. The data indicate that women are represented by counsel more frequently than men. Interestingly, the higher female success rate continues even when examining only applications reflecting the presence of an attorney. Below we will examine the effects of the presence of counsel and gender through a regression analysis to gain a better understanding of the extent to which each variable contributes to success before the USPTO in registering trademarks.

As noted above, the percentage of applications filed by legal counsel has declined dramatically over the years.[206] A substantial portion of this drop occurred around October of 1998, when the Trademark Office began accepting online applications.[207] From 1997 to 1999, the overall rate of attorney representation within our cadre dropped by 15.9%—accounting for more than half of the observed reduction over the 32 year period studied as shown below.

The gender-specific representation rate was similar by 2018 (women were 2.2% more likely to have an attorney), with male and female representation rates dropping to 26.4% and 23.6% during our study period, respectively.[208]

Another interesting finding involved the relatively small percentage of applications filed by two person who were of different genders. We evaluated the gender-pairings of two individual-applicant filings from the U.S. These applications comprised 28.4% (298,758 total) of individual applications from 1986-2018.[209] Of this group, 277,285 applications (90.1%) had gender data for both applicants (554,570 total applicants). The group included 151,265 women (27.3%) and 403,305 men. The pairings were women-women (25.7%), men-women (3.1%), and men-men (71.2%)—showing a dearth of cross gender filings.

Regarding oppositions, the rate of opposition for published applications was diverged between the genders by over half of a percent, with women having opposition filed against them less often. Across the cadre, opposition rates were: women (2.59%) and men (3.25%). These rates are further explored in the regression analysis section.

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[206] *See supra* Figure V.

[207] A PATENT AND TRADEMARK OFFICE REVIEW: FISCAL YEAR 1998 at 22, UNITED STATES. PATENT AND TRADEMARK OFFICE ("In October 1998, we expanded the pilot to make Internet filing available to all customers.").

[208] Including 95% confidence intervals, the representations rates were: men (41.8% ±.5%), women (44.0 ± .7%),

[209] The balance of individual, domestic applications were: single (29.0%), triple (36.6%), quadruple (2.5%), and five or more (3.5%).

Lastly, it is notable that we observed a substantial difference in the registration success rate by attorney gender. For domestic individual filings between 1986-2015 (inclusive), female attorneys secured registration 58.16% of the time, compared to 54.24% for male attorneys.[210]

B. Regression Analysis

This section tests the variables we describe above for statistical significance. We do so by presenting odds ratios from several regressions on our cadre of trademark applications. An odds ratio of 1.50 indicates that when that variable is present, the application is 50% more likely to succeed at registration. An odds ratio of .50 means that the application is 50% less likely to register. Given the binary nature of the independent variables analyzed, logistic regressions were employed.[211]

1. Registration

Model 1 in Table X evaluated the registration outcomes (registered or not) for applications filed before 2015. The time limitation was imposed to avoid pending applications included in our data. This model had independent variables for attorney representation, dummy variables for year filed, and dummy variables for international trademark code. The large number of dummy variables are not reported below, but were included to control for market and time fluctuations. Attorney representation was, unsurprisingly, found to be positive and statistically significant. The attorney representation odds ratio of 1.92 indicates that an application represented by an attorney was 92% more likely to be registered relative to the balance of applicants.[212]

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[210] Additionally, for domestic individual filings between 1986-2015 (inclusive), female examiners registered 46.19% of applications, compared to 47.09% for male examiners.

[211] *See* Scott DeVito & Andrew W. Jurs, *"Doubling-Down" for Defendants: The Pernicious Effects of Tort Reform*, 118 PENN ST. L. REV. 543, 583 (2014) ("Logistic regression, not linear regression, is generally preferred when the independent variable is categorical or binary.").

[212] A sub-one odds ratio indicates a lower chance of the dependent variable occurring. For example, and odds ratio of .5 indicates that if this particular independent variable is 1, then the dependent binary variable is 50% less likely to be positive (to equal 1).

Model 2 included a continuous variable representing the percentage of individual applicants that were identified as male. Consistent with our descriptive variables, male applicants were statistically significantly less likely to secure a registration. Models 3–6 added dependent variables for applicants' likely race (on a 0-1 scale) for white, black, Asian, and Hispanic, respectively.[213] These independent variables were run in distinct models to avoid collinearity issues. An unreported version of model 2 was run, which analyzed only applications filed by attorneys and included a binary variable for "experienced attorneys" (over 30 applications filed).[214] This independent variable had an odds ratio of 1.09 which was 99.9% statistically significant.

[213] Note that models 3-7 were also run without controlling for gender. Results were largely the same: white – 1.09 (0.012)***; black – 0.77 (0.019)***; Asian 1.08 (0.017)***; and Hispanic – 0.87 (0.013)***.

[214] The 30-application threshold for an experienced attorney was adopted from prior work. Deborah R. Gerhardt & Jon P. McClanahan, *Do Trademark Lawyers Matter?*, 16 STAN. TECH. L. REV. 583, 611 (2013).

Table 1: Registration Rates by Gender and Race

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Logistic Regression Presented Using Odds Ratios						
Attorney	1.92 (0.008)***	1.9 (0.008)***	1.9 (0.009)***	1.9 (0.009)***	1.9 (0.009)***	1.9 (0.009)***
Male		0.81 (0.004)***	0.81 (0.004)***	0.81 (0.004)***	0.81 (0.004)***	0.81 (0.004)***
White			1.08 (0.012)***			
Black				0.76 (0.02)***		
Asian					1.12 (0.02)***	
Hispanic						0.89 (0.014)***
Filed 1986-1990	1.85 (0.022)***	1.87 (0.023)***	1.87 (0.023)***	1.87 (0.023)***	1.88 (0.023)***	1.87 (0.023)***
Filed 1991-1995	1.06 (0.009)***	1.08 (0.01)***	1.08 (0.01)***	1.08 (0.01)***	1.08 (0.01)***	1.08 (0.01)***
Filed 1996-2000	0.85 (0.006)***	0.87 (0.006)***	0.87 (0.006)***	0.87 (0.006)***	0.87 (0.006)***	0.87 (0.006)***
Filed 2001-2005	0.85 (0.005)***	0.87 (0.006)***	0.87 (0.006)***	0.87 (0.006)***	0.87 (0.006)***	0.87 (0.006)***
Filed 2006-2010	referent					
Filed 2011-2015	1.26 (0.007)***	1.26 (0.008)***	1.26 (0.008)***	1.26 (0.008)***	1.26 (0.008)***	1.26 (0.008)***
46 Dummy Variables for International Classes						

Constant	0.52 (0.044)***	0.61 (0.054)***	0.57 (0.051)***	0.62 (0.055)***	0.6 (0.054)***	0.61 (0.054)***
	n = 924,113	n = 866,309	n = 855,481	n = 855,481	n = 855,481	n = 855,481
***p<0.001, **p<0.01, *p<0.05 Standard errors are displayed in parentheses.						

2. **Opposition**

Running a regression on the frequency at which applications confront opposition proceedings is one way to investigate whether women, men, and minorities are more likely to have their applications opposed. To address this question, we analyzed published applications, because it is only post-publication that third parties can file opposition proceedings. We also limited this regression to applications filed before 2015 to ensure ample time for an opposition to be filed. Model 1 in Table 2 analyzes whether an application was opposed (the dependent variable) controlling for attorney representation, international class, and year filed. Model 2 adds gender data; it finds that male applicants are significantly more likely to have an opposition filed.

Models 3-6 add race data for white, black, Asian, and Hispanic applicants, respectively.[215] It finds that white applicants are statistically significantly less likely to have an opposition filed against them. Black applicants are not significantly more or less likely to have an opposition filed, and Asian and Hispanic applicants are statistically significantly more likely to have an opposition filed.

It is notable that an additional series of regression were run where the cadre was limited only to attorney-represented applications, and the attorney independent variable was omitted. The results were white [0.69 (0.034)***], black [0.91 (0.111)], Asian [1.52 (0.111)***], and Hispanic [1.4

[215] One intermediate model was run before Model 3, not accounting for gender but including the white independent variable. There was little change, with the results for the white variable being 0.76 (0.025)***, as opposed to 0.77 (0.028)*** when gender was controlled for.

(0.091)***]. Accordingly, regardless of how attorney-representation was accounted for, the results were largely the same for all racial and ethnic minorities.

Table 2: Opposition Rates by Gender and Race

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Logistic Regression Presented Using Odds Ratios						
Attorney	0.97 (0.014)	0.97 (0.014)	0.98 (0.015)	0.97 (0.015)	0.97 (0.015)	0.97 (0.015)
Male		1.2 (0.021)***	1.2 (0.021)***	1.2 (0.021)***	1.2 (0.021)***	1.2 (0.021)***
White			0.77 (0.028)***			
Black				0.94 (0.082)		
Asian					1.41 (0.077)***	
Hispanic						1.23 (0.06)***
Filed 1986-1990	1.17 (0.042)***	1.14 (0.042)***	1.15 (0.043)***	1.15 (0.042)***	1.15 (0.043)***	1.15 (0.042)***
Filed 1991-1995	1.25 (0.033)***	1.23 (0.033)***	1.24 (0.034)***	1.23 (0.033)***	1.24 (0.034)***	1.24 (0.034)***
Filed 1996-2000	1 (0.024)	0.98 (0.024)	0.99 (0.024)	0.99 (0.024)	0.99 (0.024)	0.99 (0.024)
Filed 2001-2005	referent					
Filed 2006-2010	0.78 (0.016)***	0.79 (0.017)***	0.78 (0.017)***	0.79 (0.017)***	0.78 (0.017)***	0.78 (0.017)***
Filed 2011-2015	0.72 (0.015)***	0.72 (0.016)***	0.71 (0.016)***	0.72 (0.016)***	0.72 (0.016)***	0.72 (0.016)***
46 Dummy Variables for International Classes						

Constant	0.64 (0.054)***	0.03 (0.011)***	0.04 (0.013)***	0.03 (0.011)***	0.03 (0.011)***	0.03 (0.01)***
	n = 635,194	n = 598,914	n = 591,802	n = 591,802	n = 591,802	n = 591,802
***p<0.001, **p<0.01, *p<0.05 Standard errors are displayed in parentheses.						

Models 3-6 show us that white applicants are less likely to have their applications opposed, while Asian and Hispanic applications are more likely to have their applications opposed. These models, however, do not account for the quality of the application. Perhaps the applications associated with a certain set of demographics are lower in quality and as a result are simply more likely to be confused with earlier marks, despite being published.

We explore the issue of whether applications are being disproportionately opposed to the applicant's demographic attributes by analyzing a slightly different dataset, comprising all published and registered applications, including those that were never opposed and those that were unsuccessfully opposed. This allows us to identify demographic attributes associated with having a non-meritorious opposition filed. Again, only applications from before 2015 were analyzed.

Model 1 in Table 3 evaluated the likelihood that a registered mark was opposed during prosecution with regard to whether the applicant was represented by an attorney. We found that attorney representation positively correlated with having a non-meritorious opposition filed against the application. This is likely due to the attorney helping the applicant win the opposition (and thus, establish it as non-meritorious). Model 2 added gender data, finding that male applicants were statistically significantly more likely to have their applications opposed.

Models 3-6 controlled for racial attributes, with mixed findings.[216] Consistent with expectations from earlier models (e.g., Hispanic applicants had less success in trademark prosecution and Asian applicants had more), Hispanic applicants were statistically significantly more likely to have a non-meritorious opposition filed against them. Likewise, Asian applicants were statistically significantly less likely to face a non-meritorious opposition. Both findings were significant only to 95%. No significant findings were observed for white or black applicants.

[216] One intermediate model was run before Model 3, not accounting for gender but including the white independent variable. There was little change, with the results for the white variable being 0.98 (0.069), as opposed to 0.96 (0.073) when gender was controlled for.

Table 3: Non-Meritorious Opposition Rates by Gender and Race

.	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Logistic Regression Presented Using Odds Ratios						
Attorney	1.42 (0.043)***	1.4 (0.044)***	1.41 (0.044)***	1.41 (0.044)***	1.4 (0.044)***	1.41 (0.044)***
Male		1.11 (0.038)**	1.11 (0.038)**	1.11 (0.038)**	1.11 (0.038)**	1.11 (0.038)**
White			0.96 (0.073)			
Black				1.17 (0.203)		
Asian					0.77 (0.097)*	
Hispanic						1.22 (0.122)*
Filed 1986-1990	0.99 (0.064)	0.98 (0.065)	0.98 (0.065)	0.98 (0.065)	0.97 (0.065)	0.98 (0.065)
Filed 1991-1995	1.26 (0.064)***	1.25 (0.065)***	1.26 (0.065)***	1.26 (0.065)***	1.25 (0.065)***	1.26 (0.065)***
Filed 1996-2000	1.02 (0.047)	1.04 (0.049)	1.04 (0.049)	1.04 (0.049)	1.04 (0.049)	1.04 (0.049)
Filed 2001-2005	referent					
Filed 2006-2010	0.76 (0.032)***	0.77 (0.034)***	0.77 (0.034)***	0.77 (0.034)***	0.77 (0.034)***	0.77 (0.034)***
Filed 2011-2015	0.64 (0.028)***	0.65 (0.029)***	0.65 (0.029)***	0.65 (0.029)***	0.65 (0.029)***	0.65 (0.029)***
46 Dummy Variables for International Classes						
Constant	0.01 (0.007)***	0.01 (0.007)***	0.01 (0.007)***	0.01 (0.007)***		
	n = 426,700	n = 402,291	n = 397,545	n = 397,545	n = 397,545	n = 397,545
***p<0.001, **p<0.01, *p<0.05 Standard errors are displayed in parentheses.						

Similar to the above, we ran a second series of regressions controlling for attorney representation by only evaluating registered applications with attorney representation. The findings were similar to the above. Regression results were: male [1.13 (0.047)**], white [0.93 (0.087)], black [1.04 (0.232)], Asian [0.81 (0.126)], and Hispanic [1.31 (0.16)*]. Again, we found an increased likelihood that Hispanic applicants would have their application opposed, but the statistical significance disappeared for the finding that Asian applicants were less likely to have their application opposed.

3. Gender Bias in Examination

Prior research has found a negative bias to exist among female patent applicants who could be identified as a woman from their name (e.g., they had a feminine-sounding name).[217] Accordingly, we next analyzed whether the examiner's ability to identify the gender of an applicant influenced their decision regarding whether an application satisfied the statutory requirements to be published.

To do this, we had to identify a cadre of single-applicant filings submitted by women. This group would be broken down into two subsets: women with clearly feminine names and women that have rare names that could not identify their gender to the average trademark examiner. Comparing the publication rate for these tow subsets is a "like-to-like" (female applicant to female applicant) comparison, such that we can determine if an examiner's knowledge of the applicant's gender influences their review. We find no evidence of such a bias.

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[217] *See* Jensen et al., *supra* note 66, at 309. Their data showed that female applicants with an obviously feminine name secured a patent 8.2% less often than men, while women with androgynous names found this effect mitigated to a 2.8% disparity.

Consistent with past studies,[218] to identify female applicants on single-applicant filings with androgynous names, we located applications that listed only a single name (plus potentially an initial or title). That name was then compared to two datasets. First, we identified whether the applicant was a woman using *Martinez, Raffo, and Saito*. This allowed us to code for the substantial majority of female applicants. Then we compared the first name to our social security dataset to determine if it appeared on the Social Security Administration's top 1,000 boy and girl names for any year in 1901-2000.

Given the breadth of *Martinez, Raffo, and Saito*, we are able to identify a cadre of female applicants with rare, but gender-specific, names. Examples of rare feminine names from our dataset are Maluki, Elone, Dailey, and Ximena. From the dataset, we know these names are feminine, but the average examiner may not identify the applicant as a woman. This produced a cadre of 67,764 applications with 6,437 female applicants with rare, androgynous names. We created a dummy variable for whether the applicant had a rare name or not.

We ran logistic regressions with the independent variable being whether an application was published, controlling for international class, attorney representation, and year filed (broken into 5-year segments). Analysis found that the androgynous name was not statistically significant. For robustness purposes, we also ran the analysis looking only at attorney-represent filings and changing the year filed control to single year dummy variables. No change was identified.

Lastly, we ran the same analysis with regard to whether a published application was opposed. Again, we found no evidence that, among female applicants, having an androgynous name was statistically significant. This tested whether other trademark owners (as opposed to trademark examiners) were influenced by a feminine name among all female applicants.

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[218] *Id.* at 307; Schuster, et al., *supra* note 72

Both of the above analyses (publication and opposition) were likewise run for a cadre of 199,661 male applicants with 18,903 gender non-identifying names. Logistic regression again found no evidence of bias in publication or opposition rate.[219]

VI. Conclusion

We found that trademark applications reflect a unique and nuanced landscape relative to other intellectual property registrations. Our findings reflect that both women and minorities are substantially underrepresented in the trademark applicant pool of individual applicants. The presence of counsel generally contributes to the success of an application, and minorities are less likely to be assisted by counsel in prosecuting marks, while women are more likely. Regression analysis indicates that even when controlling for the presence of counsel, some racial minorities have been less successful than white applicants in succeeding at trademark publication and registration. In stark contrast, women are more likely to succeed than men at both publication and registration. Importantly, our analysis has not uncovered potential bias on the examiner's side during prosecution of trademarks with regards to both genders. These differences raise important questions for further research on the reasons for these gender disparities.

[219] We were unable to run a similar analysis with regard to race. There is no set of rare or uncommon names that are race-specific, but which are not common enough to identify the applicant's race to an examiner. Future research on this issue may be warranted.