AN EMPIRICAL STUDY OF GENDER AND RACE IN TRADEMARK PROSECUTION

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ABSTRACT

This Article is the first to empirically examine the extent to which women and minorities succeed in prosecuting trademark applications before the United States Patent and Trademark Office ("USPTO"). Trademark registration is an important measure of entrepreneurial activity and progress in business, education, and the arts. To explore how women and minorities are succeeding in this domain, we compared 1.2 million trademark applications over thirty years with demographic information on race and gender.

We analyze whether trademark prosecution reflects systematic underrepresentation of women and minorities similar to those reported in patent and copyright prosecution. We found that trademark data showed significant differences from the other two federal intellectual property ("IP") regimes. Our analysis reveals that women regularly secure trademark registration at a higher rate than men. Women are underrepresented in the pool of trademark applicants compared to their presence in the population, but not all minority groups are underrepresented. For women and underrepresented

minorities, the disparity is decreasing at a rate not seen in other IP registration systems.

While recent work has significantly advanced our understanding of trademark prosecution, no published studies consider the race and gender of trademark applicants. By filling that void, this Article substantially contributes to our understanding of minority intellectual property ownership and provides a new foundation for policy shifts and further research to assure that intellectual property ownership paths, theory, law, and reform are grounded in equality.

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INTRODUCTION

This Article is the first to empirically analyze how race and gender correlate with 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 Supreme Court's 2017 decision in *Matal v. Tam*, the USPTO invested substantial resources fighting to uphold a federal law which allowed it to reject trademark applications seeking federal registration of disparaging words such as racial slurs. It lost, meaning that offensive trademarks can be approved and earn the USPTO seal of approval. 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 analyze USPTO registration data to examine the extent to which demographic attributes correlate with success before the USPTO.

Recent scholarly work has uncovered gender inequities, racial disparity, and potential bias in patent examination. Studies have found some evidence of biases against women in patent examination and underrepresentation of women and minority groups in the patent and copyright systems. In this Article, we examine whether these patterns are reflected in trademark registration data. We hypothesize that one may expect to see similar disparities. 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 estimate the race and gender of trademark applicants.

The Article proceeds as follows. Part I provides an overview of the common law and federal trademark protection and the benefits of federal registration. Part II 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 III 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 IV sets forth our findings. We begin by dividing the data into corporate and individual trademark applicants and describing the respective success rates of each group. Next, we shift focus to the subset of applications filed by individuals and uncover the differences in success rates that correlate with gender and race. The data reveals how these attributes may affect success in overcoming oppositions, obtaining publication, and ultimately, registration. Because trademark applications can be prosecuted with or without counsel, we examine 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 the population of trademark applicants relative to their presence in the U.S population?

2. Does the gender or race of an individual trademark 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?

4. Does the USPTO trademark application data reflect institutional bias based on gender?

5. Have these trends changed over time?

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.

I. 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.[1] Marks may be licensed[2] or assigned[3] without

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1.   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 holder's actions). Trademark owners must take some additional steps, such as periodically certifying continued use, in order to maintain federal registration. 15 U.S.C. §§ 1058–59.

2.   *Id.* § 1127; Yocum 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).

3.   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).

losing protection. Both federal and state trademark law protect a mark (whether or not it is registered) against unfair competition, false advertising and harm to business reputation.[4] Infringement liability may be asserted to defend against confusingly similar uses in the protected geographical area.[5]

Trademark rights are created through use in commerce, even if the mark is not registered.[6] 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 a combination of these elements, that is used to identify one's goods or services and distinguish them from others.[7] Although registration is not necessary to obtain protection, mark owners often buttress their rights by registering their marks with the USPTO.[8]

Mark owners may additionally register their marks with individual states, but state registration provides little value beyond common law protection obtained through use in commerce.[9] The scope of state protection may be limited to the geographic area of use or the bounds of the state, depending on the jurisdiction.[10] Even without registration, common law assigns trademark rights to the first user of a mark for a particular type of business.[11] If two firms use the same mark in the same geographic location,

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4.   15 U.S.C. § 1125.

5.   *Id.* § 1125(a)(1); Polaroid Corp. v. Polarad Elecs. Corp., 287 F.2d 492, 495 (2d Cir. 1961); Vitarroz Corp. v. Borden, Inc., 644 F.2d 960, 966–69 (2d Cir. 1981).

6.   15 U.S.C. § 1125.

7.   *Id.* § 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. L. INST. 1995). In addition to source identifying indicia, such as product names and service marks, trademark law provides the means to register shared qualitative or organizational symbols. 15 U.S.C. § 1127; Coca-Cola Co. v. Koke Co. of Am., 254 U.S. 143, 145–46 (1920). Certification marks signal geographic origin or quality, such as "Champagne" or "organic" while collective marks, such as "AAA," refer to membership in an organization. *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).

8.   *See, e.g.*, 15 U.S.C. § 1057(b) (presumption of validity); *id.* § 1065 (incontestability); *id.* §§ 1117, 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).

9.   3 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 22:1 (5th ed. 2020).

10.   15 U.S.C. § 1065 (noting the existence of state trademarks); Dorpan, S.L. v. Hotel Meliá, 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 MCCARTHY, *supra* note 9 (explaining that the protection extended by state trademarks is limited to the boundaries of the state or the geographic region of the marks use).

11.   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

the first ("senior") user maintains rights in the mark to the exclusion of the later ("junior") adopter.[12] The senior party enjoys priority (a superior claim to trademark right) over the junior party with regard to the mark.

The common law of trademarks is founded on both the idea of protecting business investment in symbols and minimizing consumer confusion or deception.[13] If their markets do not overlap, two common law users may develop the same mark on products in different locations, and each can have rights in their mark limited to their geographic territory.[14] A conflict may arise in one of two ways. If the two firms expand so that their markets overlap and generate consumer confusion, a court may assess who used the mark first in the region to determine priority. A conflict may also arise if one of the common law users seeks to register the mark.

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 mark in multiple ways. One advantage is that registration may confer nationwide priority across the United States, regardless of whether the mark is actually being used nationwide.[15] 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 in local or regional markets. A limited area exception provides some protection to earlier users who failed to register.[16] 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.[17] Although federal law provides some protection

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appropriation determines the question."); Emergency One, Inc. v. Am. Fire Eagle Engine Co., 332 F.3d 264, 267 (4th Cir. 2003).

12.   *See id.* ("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.' ").

13.   *See* 3 MCCARTHY, *supra* note 9, § 2:1 (indicating that protecting the public from deception and mark owners from having their labor misappropriated are the primary policies justifying trademark protection and adding that trademark law also encourages competition).

14.   *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 (5th ed. 2020).

15.   15 U.S.C. §§ 1057(c), 1072; 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).

16.   15 U.S.C. §§ 1052, 1057(c).

17.   *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)).

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 the actual geographic scope of their business.[18]

Even before a brand is 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.[19] Therefore, the possibility of securing nationwide priority is a strong incentive for seeking federal registration.

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.[20] Owners can attach a statutory registration notice to their marks,[21] 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.[22]

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 mark. 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 for similar goods or services. In this way, a mark's appearance on the Principal Register[23] confers potentially significant deterrent value. If a new entrant misses a registration that is

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

19.   *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.").

20.   15 U.S.C. § 1057(b).

21.   *Id.* § 1111.

22.   4 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 25:15 (5th ed. 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.").

23.   A trademark can be federally registered on the principal or supplemental register. Marks registered on the principal register are afforded many rights. *See, e.g.*, 15 U.S.C. § 1057(b)–(c); *see also* Jason K. Levine, *Contesting the Incontestable: Reforming Trademark's Descriptive Mark Protection Scheme*, 41 GONZ. L. REV. 29, 37 (2006) (detailing the rights afforded by entry on the principal register). However, where a mark is capable of identifying the source of a product, but is currently descriptive, it may be placed on the supplemental register until secondary meaning is established. "Placement on the Supplemental Register creates no substantive rights in the registrant." Eldon Indus., Inc. v. Rubbermaid, Inc., 735 F. Supp. 786, 833 (N.D. Ill. 1990).

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.[24] 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 the assistance of legal counsel in selecting a mark. Such counsel can increase the likelihood of obtaining approval for registration from the USPTO and 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.[25]

Once the mark is selected, an applicant may prepare and file an application. All applications must be submitted through the USPTO's online platform which requires payment of an application fee.[26] After the application is submitted, an examining attorney is assigned to review it.[27] At that time, an examination of the application will proceed and include a search for confusingly similar marks that are currently registered.[28] 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.[29] The applicant will then be given six months to respond or repair the defect.[30] If no office action occurs or if the applicant cures the defect, the mark will be published in the Official Gazette.[31] Publication marks USPTO approval of

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[24]. *Trademark Process*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/trademarks-getting-started/trademark-process#step6 [https://perma.cc/9MN3-68WZ#step1].

[25]. *See Possible Grounds for Refusal of a Mark*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/trademark/additional-guidance-and-resources/possible-grounds-refusal-mark [https://perma.cc/6E3L-BJ85].

[26]. The fee ranges from $225 to $400 for each mark in each class of goods and services. *USPTO Fee Schedule*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Fees [https://perma.cc/9EDH-K46N].

[27]. *Trademark Process*, *supra* note 24.

[28]. *See id*.

[29]. *See id*.

[30]. *Id.*

[31]. *Id.*

the application, but opens a thirty-day window for third parties to oppose the registration before it occurs.[32] While two out of every three applications receive an office action, only about 3% are challenged post-publication through opposition proceedings.[33] When no opposition is filed or the opposition is unsuccessful, the USPTO will issue a certificate of registration if the application was based on use. [34]

If the applicant has not yet used the mark in commerce and applied to register the mark based on a good faith intent to begin using it soon, the USPTO will issue a notice of allowance conditioned upon filing a statement of use within six months.[35] An examining attorney will also review the statement of use before a registration certificate is issued.[36] To maintain a registration, the trademark owner must reaffirm continued use by filing statements of continued use at regular intervals.[37]

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 may introduce an additional expense. While the costs are generally much less than one might incur in the patent application process, the costs can be higher if an attorney is hired. If the application confronts obstacles through multiple rounds of office actions or opposition proceedings, such attorney costs can be significant.

Empirical research by Deborah R. Gerhardt and Jon McClanahan demonstrates that this investment is correlated with success in prosecuting federal trademark applications.[38] 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, having an attorney—and especially an attorney with trademark experience—significantly increases success rates before the USPTO.[39] They also found that most applications had to overcome at least one office action before advancing to publication.[40] For example, their data show 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.[41]

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32. *Id.*
33. Deborah R. Gerhardt & Jon P. McClanahan, *Do Trademark Lawyers Matter?*, 16 STAN. TECH. L. REV. 583, 620 (2013).
34. *Trademark Process*, *supra* note 24.
35. *See id.*
36. *Id.*
37. *See* 15 U.S.C. § 1058; *Trademark Process*, *supra* note 24.
38. Gerhardt & McClanahan, *supra* note 33, at 622.
39. *Id.* at 593, 622.
40. *Id.* at 615, 622.
41. *Id.* at 622.

Given this study and others demonstrating that many variables affect the trademark application process, we delve into questions of 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 affect success rates, the 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.

II. LITERATURE REVIEW

A large body of social science literature and legal scholarship documents race and gender disparities on many subjects, including intellectual property protection. Notwithstanding this deep trove of research, compared to patent and copyright work, little was previously known about gender and race disparities in trademark registration.[42]

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 in hiring and promotion.[43] Women experience pay inequity,[44] and discrimination in healthcare treatment,[45]

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42.   *See infra* Section II.B. *See generally* Anjali Vats & Deidré A. Keller, *Critical Race IP*, 36 CARDOZO ARTS & ENT. L.J. 735, 755 (2018).

43.   *See generally* Kim M. Blankenship, *Bringing Gender and Race in: U.S. Employment Discrimination Policy*, 7 GENDER & SOC'Y 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 GENDER & SOC'Y 764 (2011); Kim Parker & Cary Funk, *Gender Discrimination Comes in Many Forms for Today's Working Women*, PEW RSCH. CTR. (Dec. 14, 2017), https://www.pewresearch.org/fact-tank/2017/12/14/gender-discrimination-comes-in-many-forms-for-todays-working-women [https://perma.cc/AX55-YS3F] (showing that there still exists gender discrimination in the United States 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 2020*, U.S. EQUAL EMP. OPPORTUNITY COMM'N, https://www.eeoc.gov/eeoc/statistics/enforcement/sex.cfm [https://perma.cc/D7BA-NQZ4] (data compiled by the Equal Employment Opportunity Commission's Office of Enterprise Data and Analytics that summarizes the number of charges filed and resolved under Title VII alleging sex-based discrimination, going through fiscal year 2020).

44.   *See generally* Francine D. Blau & Lawrence M. Kahn, *Gender Differences in Pay*, 14 J. ECON. PERSPS. 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. SOCIO. REV. 204 (2001).

45.   *See generally* 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).

higher-education admission, and promotion. They are also subjected to more sexual harassment than men.[46] Female-led households experience discrimination in the rental business.[47] Discrimination has also been documented on online platforms such as eBay, where female sellers are paid less than men and tend to get fewer bids in auctions.[48] Such inequities persist despite cultural movements like #MeToo that have dramatically increased awareness of sexual harassment and consequential discrimination.

Discrimination based on race has also been extensively studied and documented.[49] Racial discrimination against African Americans has been shown in multiple institutional systems including hiring and pay.[50] Additional surveys and studies document discrimination against different minority groups such as Latinx, Asians, and Native-Americans. While only 29.61% of Whites reported racial discrimination, 69.45% of African Americans, 56.59% of Asians, and 45.01% of Latinx experience discrimination from time to time or regularly.[51] Further, 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.[52] Other work focused on race-based bullying in workplaces, with the Latinx group reporting the greatest amount of harm.[53]

This unfortunate pattern is reflected in the prosecution of intellectual

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46.   *See generally* Gillian K. SteelFisher, Mary G. Findling, Sara N. Bleich, Logan S. Casey, Robert J. Blendon, John M. Benson, Justin M. Sayde & Carolyn Miller, *Gender Discrimination in the United States: Experiences of Women*, 54 HEALTH SERVS. RSCH. 1442 (2019); Remus Ilies, Nancy Hauserman, Susan Schwochau & John Stibal, *Reported Incidence Rates of Work-Related Sexual Harassment in the United States: Using Meta-Analysis to Explain Reported Rate Disparities*, 56 PERS. PSYCH. 607 (2006).

47.   *See generally* George Galster & Peter Constantine, *Discrimination Against Female-Headed Households in Rental Housing: Theory and Exploratory Evidence*, 49 REV. SOC. ECON. 76 (1991).

48.   *See generally* Tamar Kricheli-Katz & Tali Regev, *How Many Cents on the Dollar? Women and Men in Product Markets*, 2 SCI. ADVANCES 1 (2016).

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

50.   *See generally* 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).

51.   Randy T. Lee, Amanda D. Perez, C. Malik Boykin, Rodolfo Mendoza-Denton, *On the Prevalence of Racial Discrimination in the United States*, 14 PLoS ONE 1, 6 (2019). This study also found that 63.10% of minorities report they have experienced racial discrimination. *Id.*

52.   *Discrimination in America Polls*, HARV. PUB. HEALTH (2018), https://www.hsph.harvard. edu/magazine/magazine_article/discrimination-in-america-polls [https://perma.cc/F9TE-ECRR].

53.   *See generally* Suzy Fox & Lamont E. Stallworth, *Racial/Ethnic Bullying: Exploring Links Between Bullying and Racism in the US Workplace*, 66 J. VOCATIONAL BEHAV. 438 (2005).

property rights. Before summarizing this literature, we note that trademark, copyright and patent registration data provide separate snapshots of innovation in differing quantities. In 2017, 650,350 patent applications were filed and the USPTO granted 373,093.[54] In 2017, 309,793 trademark applications were filed, 62,349 of which were filed by individuals. In the same year, the USPTO registered 27,326 marks for individuals.[55] In 2017, 452,122 works were registered with the United States Copyright Office.[56]

Comparing patent, copyright, and trademark registration data is not a comparison of equivalents. A helpful dimension in studying patent data is that all applications identify individual inventors, even if they are owned by corporations. Therefore, patent data provide useful information about individual contributors. Corporate copyright and trademark applicants often do not identify information about the contributions of individuals. Therefore, only a subset of copyright and trademark registration data contain information about race and gender. Additionally, copyright data is available only for registrants, not those whose registrations are denied. Trademark data contains failed applications and in this respect, includes more information than the copyright data, albeit less than the patent data which includes information on individuals that contributed to every invention. On the trademark side of the USPTO, both registered and failed applications are publicly available, although unlike the patent data, individual contributors to a mark's creation are not as easily ascertainable if the application was filed by an entity and not an individual person. While copyright data is not publicly accessible, the USPTO has offered trademark and patent data to the public in bulk for all trademark and patent applications, making these areas more accessible to researchers. Despite the differences in available information, all of these registries provide some important information about who succeeds in navigating them.

Prior studies of the intersection of IP law and gender have identified gender disparities in the rights afforded by several intellectual property regimes.[57] These factors fall into three categories: the way IP doctrines apply

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54. This includes utility, plant, reissue, and design applications. In addition, another 166,885 provisional applications were filed that year. U.S. PAT. & TRADEMARK OFF., FY 2018 PERFORMANCE AND ACCOUNTABILITY REPORT 178 (2018), https://www.uspto.gov/sites/default/files/documents/USPT OFY18PAR.pdf [https://perma.cc/Y3LZ-DEFD].

55. Consistent with the balance of this paper, a single application counts as "one" application, regardless of how many classes are named on the application. This number was calculated based on the researchers' data.

56. U.S. COPYRIGHT OFF., FISCAL 2017 ANNUAL REPORT 5 (2017), https://www.copyright.gov/re ports/annual/2017/ar2017.pdf [https://perma.cc/C7UL-YFCV].

57. *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

to subject matter involving gender and sexuality; the gendered nature of the various IP doctrines themselves; and gender disparities in participation in IP systems.[58] The following reviews this work.

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 limited monopoly, albeit for the shortest period of time. Patents send a signal that the product is new and innovative.[59] Inventors and entrepreneurs apply for patents to protect their investments in commercializing their inventions.[60] Patent ownership is also an important defensive asset to protect against competitors locking up technology.[61] Owning patents also increases the likelihood of obtaining investment funding.[62]

The USPTO does not collect demographic information for inventors. Nonetheless, the presence of inventor names makes it possible to cross reference other datasets. Using this method, empirical scholarship has revealed significant underrepresentation by race and gender. 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 shown a sizeable gender gap in applications, grants and ownership of patents.[63] Less than 30% of international patent applications

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and issues with how IP law is actually applied).

58. *Id.* at 176.

59. *See* Stuart J.H. Graham, Robert P. Merges, Pam Samuelson & Ted Sichelman, *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).

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

62. Graham et al., *supra* note 59, at 1262, 1276; Sichelman & Graham, *supra* note 61, at 122–23; Jessica Milli, Barbara Gault, Emma Williams-Baron, Jenny Xia & Meika Berlan, *The Gender Patenting Gap*, INST. FOR WOMEN'S POL'Y RSCH. 7 (2016), https://iwpr.org/wp-content/uploads/2020/12/C441_Gender-Patenting-Gap_BP-1.pdf [https://perma.cc/CZU8-BQZJ].

63. WORLD INTELL. PROP. ORG., WORLD INTELLECTUAL PROPERTY INDICATORS 2016, at 11 (2016), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2016.pdf [https://perma.cc/U985-WDU9]; *see also* U.S. PAT. & TRADEMARK OFF., PROGRESS AND POTENTIAL: A PROFILE OF WOMEN INVENTORS ON U.S. PATENTS 3 (2019), https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential.pdf [https://perma.cc/ZR49-95F9] ("Even today, women comprise a small minority of patent inventors. This fact suggests that their innovative potential is underutilized.").

list a female inventor, and fewer than 5% 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, patent applications filed by women were more likely to be rejected or confront an obstacle in the application process, and their rejections were less likely to be appealed.[66] Patent applications naming female inventors are 21% more likely to be rejected by the patent office than those identifying men.[67] Examiners allowed fewer claims in women's patents and narrowed the claims in scope and value.[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 may stem in part from bias during the USPTO examination process.[70] This research shows that gaps in patent grant rates were more pronounced when applicants' names were easily recognizable as feminine.[71] After analyzing more than 3.9 million U.S. patent applications, an empirical study found that applications filed by women are less likely to be granted than those by men.[72]

64.   Gema Lax Martinez, Julio Raffo & Kaori Saito, *Identifying the Gender of PCT Inventors* 8 (World Intell. Prop. Org., Econ. Rsch. Working Paper No. 33, 2016), https://www.wipo.int/edocs/pub docs/en/wipo_pub_econstat_wp_33.pdf [https://perma.cc/T23B-JZ2H]; *see also* INTELL. PROP. OFF., 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/5675 18/Gender-profiles-in-worldwide-patenting.pdf [https://perma.cc/T9AM-X3M5] (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, Inna Haller, Melanie Funken-Vrohlings & Hariolf Grupp, *Gender-Specific Patterns in Patenting and Publishing*, 38 RSCH. POL'Y 590, 595 (2009); Annette I. Kahler, *Examining Exclusion in Woman-Inventor Patenting: A Comparison of Educational Trends and Patent Data in the Era of Computer Engineer Barbie(R)*, 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, Balàzs Kovács & Olav Sorenson, *Gender Differences in Obtaining and Maintaining Patent Rights*, 36 NATURE BIOTECH. 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.

70.   *See id.* at 308–09.

71.   *Id.* at 309.

72.   W. Michael Schuster, R. Evan Davis, Kourtenay Schley & Julie Ravenscraft, *An Empirical Study of Patent Grant Rates as a Function of Race and Gender*, 57 AM. BUS. L.J. 281, 317–18 (2020)

Many patent doctrines that appear neutral reveal gender bias in practice.[73] The nebulous "PHOSITA" ("Person Having Ordinary Skill in the Art") standard for enablement and non-obviousness in patentability is subject to cultural biases and assumptions about who is skilled in a given art.[74] Likewise, what counts as patentable subject matter depends on what counts as an "invention," "technology," and "industrial application," categories that may be less charitable to inventive contributions in fields dominated by women.[75]

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.[76] Women tend to have fewer financial resources and less access to venture capital or other funding.[77] Women lack equivalent professional networks and other support structures that can aid them in navigating the patenting process.[78] 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.[79] In sum, substantial research documents why women secure patents far less frequently than men.

Race and ethnicity have received less scholarly attention than gender, but nonetheless, multiple studies confirm racial underrepresentation in patent prosecution. Lisa Cook and Chaleampong Kongcharoen examined patenting patterns and identified just over 1,000 African-American inventors from a

("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*. 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).

74.   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).

75.   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).

76.   *See USPTO Fee Schedule*, *supra* note 26.

77.   Alicia Robb, *Access to Capital Among Young Firms, Minority-Owned Firms, Women-Owned Firms, and High-Tech Firms*, SMALL BUS. ADMIN. OFF. OF ADVOC. 1, 31 (2013), https://www.sba.gov/sites/default/files/files/rs403tot(2).pdf [https://perma.cc/6YU8-PDQE]; Paula E. Stephan & Asmaa El-Ganainy, *The Entrepreneurial Puzzle: Explaining the Gender Gap*, 32 J. TECH. TRANSFER 475, 480–81 (2007).

78.   *See* Murray & Graham, *supra* note 73, at 667–70; Stephan & El-Ganainy, *supra* note 77, at 483–84; Wenpin Tsai & Sumantra Ghoshal, *Social Capital and Value Creation: The Role of Intrafirm Networks*, 41 ACAD. MGMT. J. 464, 473 (1998).

79.   NAT'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 [https://perma.cc/TB8N-9XD3]; Christine Wennerås & Agnes Wold, *Nepotism and Sexism in Peer-Review*, 387 NATURE 341, 341 (1997).

pool of approximately 1.2 million U.S. inventor names.[80] Consistent with this finding, a recent study by Schuster and his co-authors shows that minority inventors are less likely to secure patents compared to other applicants.[81]

Additional studies add interesting nuances. The Institute for Women's Policy Research found that Asians were most likely to have applied for a patent, while Hispanic and Black inventors were the least likely.[82] Applications by inventors of color were also less likely to be granted, particularly among women.[83] These studies suggest that further research should be conducted to confirm these patterns and determine how race and gender-based obstacles can be eliminated.

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 does not share its data in a publicly available bulk format. Despite this challenge, Professors Robert Brauneis and Dotan Oliar performed an extensive empirical study of gender, racial, and age patterns in U.S. copyright registration from 1978 to 2012.[84] Their analysis shows interesting differences in both the types of works and registration rates for various groups.[85] They found that White authors are substantially overrepresented, accounting for nearly 80% of registrations or 116% of their proportion of the general population.[86] Interestingly, Black authors are even more overrepresented, accounting for 14–15% of all registrations,[87] or 120% of their proportion of the general U.S. population.[88] Latinx authors had the lowest registration rate, accounting for less than 10% of all copyright registrations, a rate only 44.6% of their

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80.   Lisa D. Cook & Chaleampong Kongcharoen, *The Idea Gap in Pink and Black* 1, 28 (Nat'l Bureau Econ. Rsch., Working Paper No. 16331, 2010), https://www.nber.org/system/files/working_papers/w16331/w16331.pdf [https://perma.cc/U6Y9-S2E9]; *see also* Milli et al., supra note 62.

81.   *See* Schuster et al., *supra* note 72.

82.   Jessica Milli, Emma Williams-Baron, Meika Berlan, Jenny Xia & Barbara Gault, *Equity in Innovation: Women Inventors and Patents*, INST. FOR WOMEN'S POL'Y RSCH. 5 (2016), https://iwpr.org/wp-content/uploads/2020/12/C448-Equity-in-Innovation.pdf [https://perma.cc/KE8U-MY8C] (finding that the gender gap in patent applications is narrower among people of color, particularly among Hispanic and Black graduates).

83.   *Id.* at 6.

84.   *See generally* Robert Brauneis & Dotan Oliar, *An Empirical Study of the Race, Ethnicity, Gender, and Age of Copyright Registrants*, 86 GEO. WASH. L. REV. 46 (2018).

85.   *Id.* at 59–60.

86.   *Id.*

87.   *Id.* at 62.

88.   *Id.*

proportion of the general U.S. population.[89]

Brauneis and Oliar also found that members of different races and ethnicities differ substantially in the types of work they register.[90] 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,[91] while those who identified as Jewish were associated with a high per-capita rate of registrations, mainly of textual works.[92]

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.[93] Female authors also increased their representation over time.[94] Still, the proportion of registered female authors remained at less than the proportion of women in the labor force.[95] The fields least dominated by male authors were art and text, while the fields most dominated by men were movies and software.[96] The degree to which female authors were increasing in representation varied by type of work[97] and was driven mainly by textual works.[98]

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 Shelley Wright conducted an early feminist analysis of copyright law, focusing on two genres that were denigrated despite—or perhaps because of—significant contributions from women: the English novel and needlework.[99] 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.[100] Copyright law's economic and moral rights, by contrast, are more individualistic and patriarchal, such that protected categories of art

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89.   *Id.* at 60–61.
90.   *Id.* at 62–63.
91.   *Id.* at 63.
92.   *Id.* at 66–67.
93.   *Id.* at 73–77.
94.   *Id.* at 73.
95.   *Id.*
96.   *Id.* at 75–76.
97.   *Id.* at 76.
98.   *Id.*
99.   *See generally* Shelley Wright, *A Feminist Exploration of the Legal Protection of Art*, 7 CAN. J. WOMEN & L. 59 (1994).
100.   *Id.* at 96.

become "masculinized."[101]

Other legal scholars suggest that copyright tends to exclude female forms of creativity and knowledge.[102] Copyright laws thus have an impact upon whether women are treated equally to men in copyright-related contexts.[103] Copyright doctrine's focus on individual author control over works may also interfere with feminist use of collaborative authorship or relational structures[104] rather than ensuring dynamic audience participation in the creative process.[105] Similarly, copyright law provides lesser protections for derivative works, such as fan fiction and art, that are often produced by and for women.[106]

The intersection of race and copyright law has been explored by scholars such as Professor K.L. 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.[107] Professor Greene's work on Black artists explains that the "convoluted and complex" legal requirements for protection,[108] under which authors could easily find their works injected into the public domain, resulted in the loss of economic rights for many

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101. *Id.*

102. 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, *A Story of Her Own: A Feminist Critique of Copyright Law*, 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); Debora Halbert, *Feminist Interpretations of Intellectual Property*, 14 AM. U. J. GENDER SOC. POL'Y & L. 431, 438–44 (2006); Victoria F. Phillips, *Commodification, Intellectual Property and the Women 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).

103. *See* Bartow, *supra* note 102.

104. *See* Burk, *supra* note 102.

105. *See* Sonia K. Katyal, *Performance, Property, and the Slashing of Gender in Fan Fiction*, 14 AM. U. J. GENDER SOC. POL'Y & L. 461 (2006); *see also* Sonia K. Katyal, *Slash/ing 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).

106. *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).

107. *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) [hereinafter Greene, *Intellectual Property at the Intersection of Race and Gender*]. *See generally* K.J. Greene, *Copyright, Culture & Black Music: A Legacy of Unequal Protection*, 21 HASTINGS COMMC'NS & ENT. L.J. 339 (1998) [hereinafter Greene, *Copyright, Culture & Black Music*]; Ann Bartow, *Women in the Web of Secondary Copyright Liability and Internet Filtering*, 32 N. KY. L. REV. 449 (2005).

108. Greene, *Copyright, Culture & Black Music*, *supra* note 107, at 354.

people of color.[109] Inequality of bargaining power and broad social discrimination contribute to these inequities.[110] Professor Greene also shows how certain rather discretionary copyright doctrines, such as the idea/expression dichotomy and the originality requirement, have disadvantaged Black creators.[111]

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.[112] While both patent and copyright law require some level of innovation to obtain legal protection, trademark applications merely need to show use in commerce.[113] 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 complement patent protection.[114] Other studies show a correlation between

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109.   *Id.*

110.   *Id.* at 356–57.

111.   *Id.* at 380–89; *see also* Keith Aoki, *Distributive and Syncretic Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development)*, 40 U.C. DAVIS L. REV. 717, 763 (2007); Lateef Mtima, *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*, 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).

112.   *See* Sandro Mendonça, Tiago Santos Pereira & Manuel Mira Godinho, *Trademarks as an Indicator of Innovation and Industrial Change*, 33 RSCH. 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 Indicator?—A Micro Study* 34–35 (Ctr. for Innovation, Rsch. & Competence in the Learning Econ., 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 INDUS. & 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).

113.   15 U.S.C. § 2. International applicants who base their application on a foreign trademark registration need not even show use until they seek to renew their registration after its first five years.

114.   *See* Frederico Munari & Simone Santoni, Conference Presentation at the 4th Annual Conference of the European Policy for Intellectual Property Association, Exploiting Complementarities in IPR Mechanisms: The Joint Use of Patents, Trademarks and Designs by SMEs 17 (Sep. 25, 2009) (unpublished paper), https://www.epip.eu/conferences/epip04/files/MUNARI_Frederico.pdf [https://perma.cc/HJ9W-APSZ] (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 RSCH. POL'Y 1530, 1542 (2008) (finding, based on Canadian innovation

trademarks and entrepreneurial activities, establishing that trademarks can help entrepreneurs benefit from knowledge spillovers associated with intellectual property rights. Service marks have been studied as innovation indicators.[115] Other measures of innovation (market value gains,[116] increases in productivity and profitability,[117] firm survival,[118] and other performance-related metrics) have also been shown to correlate with trademark registration.[119] Therefore, to the extent women and minorities may be underrepresented in the population of trademark applications, research into all of these systems would be warranted to determine why certain groups are underrepresented.[120]

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).

115.	*See* Ulrich Schmoch, *Service Marks as Novel Innovation Indicator*, 12 RSCH. 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 RSCH. 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 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).

116.	*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).

117.	*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. BANKING & FIN. 70, 79 (2016) (finding that positive growth in total factor productivity among trademarking banks before the 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 AUSTL. ECON. REV. 50, 68 (2012) (finding a positive association between stock market value and trademark activity among UK service and manufacturing firms).

118.	*See* Christine Greenhalgh & Mark Longland, *Running to Stand Still?—The Value of R&D, Patents and Trade Marks in Innovating Manufacturing Firms*, 12 INT'L J. ECON. 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).

119.	*See* Christian Helmers & Mark Rogers, *Does Patenting Help High-Tech Start-Ups?*, 40 RSCH. POL'Y 1016, 1025–26 (2011) (finding that a technology start-up's decision to patent is associated with higher yearly asset growth in a study of UK-based firms).

120.	*See* EMMA WILLIAMS-BARON, JESSICA MILLI & BARBARA GAULT, INST. FOR WOMEN'S POL'Y RSCH., INNOVATION AND INTELLECTUAL PROPERTY AMONG WOMEN ENTREPRENEURS 12 (2018), https://iwpr.org/wp-content/uploads/2020/10/C472_Report-Innovation-and-Entrepreneurship-9.6.18-clean.pdf [https://perma.cc/N5U6-5VHY] (finding that male owned businesses are 7.0% likely to hold a trademark registration and female owned businesses are only 6.1% likely); NAT'L WOMEN'S BUS. COUNCIL, INTELLECTUAL PROPERTY AND WOMEN ENTREPRENEURS: QUANTITATIVE ANALYSIS 25–26 (2012), https://cdn.www.nwbc.gov/wp-content/uploads/2018/02/27192725/Qualitative-Analysis-Intellectual-Property-Women-Entrepreneurs-Part-1.pdf [https://perma.cc/CN4C-MPDW] (comparing application and grant trends by gender). If there was any doubt that trademark registration has become an

Empirical scholarship on trademark registration has accelerated since the USPTO made its bulk data publicly available to scholars in 2010.[121] Professors Gerhardt and McClanahan analyzed whether the assistance of legal counsel increases the likelihood of overcoming obstacles in federal trademark application, and, if so, by how much, by empirically studying trademark applications from 1984 through 2012.[122] Professors Barton Beebe and Jeanne Fromer empirically studied clutter on the USPTO Principal Register and found that the supply of desirable trademarks is not inexhaustible[123] and has already reached what they term "trademark depletion and congestion."[124] Gerhardt and McClanahan reached the opposite conclusion with respect to color, finding that colors are claimed as marks much less frequently than their expressive potential might suggest.[125] Our study adds to this growing body of scholarship by providing a foundation for understanding race and gender disparities that have not previously been studied with respect to trademark registration.

While no empirical work analyzes gender, race, and trademark registration,[126] some legal scholarship has focused on the intersection of trademark doctrine with gender or race. Professor Ann Bartow, for example, noted the tendency of judges to rely on personal intuition and stereotypes in

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*. *See generally* Rebecca Tushnet, *Registering Disagreement: Registration in Modern American Trademark Law*, 130 HARV. L. REV. 867 (2017). 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. *Id.* at 875–78 (explaining the benefits of trademark registration).

121. 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 [https://perma.cc/UXK2-NHHH].

122. *See* Gerhardt & McClanahan, *supra* note 33, at 622 (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).

123. *See* Barton Beebe & Jeanne C. 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).

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

125. *See* Deborah R. Gerhardt & Jon 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 in *Qualitex Co. v. Jacobson Prod. Co.*, 514 U.S. 159 (1995)).

126. Swanson, *supra* note 57, at 183–84.

deciding trademark matters.[127] Others consider sexualization of trademark analysis,[128] pointing out that courts adhere to stereotypes in deciding whether "feminine" marks have been damaged through further sexualization.[129]

Some scholars note that trademarks reflect societal perceptions of race, ethnicity, and identity.[130] Historically, advertising and trademarks have been rife with stereotyped images.[131] This includes not just Black men[132] and women,[133] but also Native-Americans and Asian-Americans. The USPTO wrestled with this issue in two recent widely reported cases involving race and trademark registration. Until recently, the Lanham Act prohibited registration of any mark that "may disparage . . . persons . . . or bring them into contempt, or disrepute."[134] 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; and after multiple appeals, the decision was upheld.[135] The disparagement bar was at issue again in *Matal v. Tam*, in which an Asian-American electronic dance band sought to register "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 found that "[t]he disparagement

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

128. Leigh A. Hansmann, *Sex, Selling Power, and Salacious Commentary: Applying the Copyright Fair Use Doctrine in the Trademark Context*, MICH. ST. L. REV. 843, 859–60, 864 (2008); *see also* Jennifer E. Rothman, *Sex Exceptionalism in Intellectual Property*, 23 STAN. L. & POL'Y REV. 119, 127–28, 132–36 (2012).

129. Hansmann, *supra* note 128, at 862.

130. *See* Llewellyn Joseph Gibbons, *Semiotics of the Scandalous and the 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).

131. *See* Ross D. Petty, Anne-Marie G. Harris, Toni Broaddus & William M. Boyd III, *Regulating Target Marketing and Other Race-Based Advertising Practices*, 8 MICH. J. RACE & L. 335, 347–49 (2003).

132. Greene, *Intellectual Property at the Intersection of Race and Gender*, *supra* note 107, at 375–76.

133. *Id.* at 376–77.

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

135. Pro-Football, Inc. v. Harjo, 567 F. Supp. 2d 46, 61 (D.C. Cir. 2008). In a second case with different plaintiffs, the "Redskins" mark was challenged again. *See generally* Blackhorse v. Pro-Football Inc., Cancellation No. 92046185, 2014 TTAB LEXIS 231 (T.T.A.B. 2014). The Trademark Trial and Appeal Board (TTAB) cancelled six trademark registrations held by the football team as disparaging to a substantial composite of Native Americans. On appeal, the district court affirmed the TTAB's decision and the USPTO canceled the federal registration. Pro-Football, Inc. v. Blackhorse, 112 F. Supp. 3d 439, 490 (E.D. Va. 2015); Harjo v. Pro-Football, Inc., 50 U.S.P.Q.2d 1705 (T.T.A.B. 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).

clause violates the First Amendment's Free Speech Clause. Contrary to the Government's contention, trademarks are private, not government speech."[136] Following this holding, the Redskins registration was reinstated.[137] After the murder of George Floyd inspired global anti-racist protests, the team announced it would begin the process of changing its name.[138]

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. To support that goal, this Article advances our understanding of how gender and race correlate with individual trademark registration. Our methodology is set forth in the following Part.

III. METHODOLOGY

The USPTO makes bulk datasets available for download, including applicant, application, and registration information.[139] Each field in an application corresponds with a column within the available data. Accessible information includes a 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 with the assistance of legal counsel, and whether the mark advanced to publication and registration.[140]

Our empirical analysis began with this bulk data. Many trademark applications are filed by businesses entities, but a large number of applications are also filed by individuals. In order to analyze demographic information, we initially identified all (1,022,268) applications filed by domestic individuals between 1986 and 2018.[141] The subset of applications

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

137.   *See generally* Ned Snow, *Free Speech and Disparaging Trademarks*, 57 B.C. L. REV. 1639 (2016) (discussing *Matal* between the rulings by the Federal Circuit and the Supreme Court's opinion); 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); Les Carpenter, *Washington's NFL Team to Retire Redskins Name, Following Sponsor Pressure and Calls for Change*, WASH. POST (July 13, 2020), https://www.washingtonpost.com/sports/2020/07/13/redskins-change-name-announcement [https://perma.cc/AW89-26AN].

138.   Carpenter, *supra* note 137.

139.   *Trademark Case Files Dataset*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/le arning-and-resources/electronic-data-products/trademark-case-files-dataset-0 [https://perma.cc/TJB2-3R2B].

140.   *See USPTO Bulk Downloads: Trademarks*, GOOGLE, http://www.google.com/googlebooks/ uspto-trademarks.html [https://perma.cc/WYB3-HMU5]; *Bulk Data Products*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/learning-and-resources/bulk-data-products [https://perma.cc/D8VP-7S3X].

141.   This data did include additional information (for example, registration or opposition data) for

we discuss below constitutes 16.17% of all applications filed between 1986 and 2018. As explained in more detail below, we applied information 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

The available trademark dataset includes information for all applications and owners, regardless of the type of applicant (for example, corporation, individual, and so forth), whether the owner was the original applicant or a subsequent assignee, and if the application was foreign or domestic.[142] We isolated applications filed by individual applicants from 1986 to 2018 so that we could quantify success rates for marks 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.[143] Applicants are likewise given one of twenty-four "legal entity codes" associated with tax and legal classification of the owner; the code "1" is given to individuals.[144] We kept applications filed by at least one individual applicant (that is, 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.[145]

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 (that is, one divided by the total number of authors or inventors).[146] We

as late as June 2019, but to allow for year-to-year comparison, we used only data from 2018 and earlier. Data from before 1986 was not used because preliminary analysis showed this information to have signs of potentially being incomplete or incorrect. Note that an applicant was considered individual and domestic if an individual was listed as the first of the applicants and that person was coded as being a U.S. citizen. Moreover, for the balance of this Article, we treat an application as "one application" regardless of how many international classes are named on the application (unless otherwise noted).

142.   *See generally* Stuart J.H. Graham, Galen Hancock, Alan C. Marco & Amanda Fila Myers, *The USPTO Trademark Case Files Dataset: Descriptions, Lessons, and Insights*, 22 J. ECON. & MGMT. STRATEGY 669 (2013) (describing the scope of the Trademark Case Files Dataset, which we used for this analysis).

143.   *Id.* at 695.

144.   *Id.* at 696. As of 2013, "[a]bout 63.8% 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% of observations in the data file." *Id.*

145.   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.

146.   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 MGMT. SCI. 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).

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 application was filed by one man and one woman, it was coded as being 50% female and 50% male.[147] Identification of applicants' gender and race information is described below.

B. RACE

To analyze application trends and success rates by race, we used each individual applicant's name to estimate the likelihood that an applicant identified with a particular race. 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, or Pacific Islander ("Asian"); or Hispanic or Latino ("Hispanic").[148] In making these categorizations, we employed a taxonomy presented by the U.S. Census Bureau[149] which was used in prior work.[150]

Racial information was initially gleaned from the applicant's first name and Konstantinos Tzioumis's *Demographic Aspects of First Names*.[151] In the article, Tzioumis presents probabilities that over 4,000 given names are associated with a certain race through information ascertained from applicant-reported data in domestic mortgage filings.[152]

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147.   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.

148.   The 2000 Census does not treat Hispanic as a race; it included a question asking if the individual was Hispanic, which was followed by a question asking the individual to identify a race but did not include Hispanic as a race. *See* U.S. DEP'T OF COM. BUREAU OF THE CENSUS, UNITED STATES CENSUS 2000, at 3, https://www.census.gov/dmd/www/pdf/d02p.pdf [https://perma.cc/HK4G-7UM2]. As such, an individual could identify as both Hispanic *and* White, Black, Asian, and so on. 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, CHARLES D. COLEMAN, ROBERT NUNZIATA & ROBERT KOMINSKI, U.S. CENSUS BUREAU DEMOGRAPHIC ASPECTS OF SURNAMES FROM CENSUS 2000, at 4 (2000), https://www2.census.gov/topics/genealogy/2000surnames/surnames.pdf [https://perma.cc/5DHE-JWAG]. Note that instances where the percent of people with a particular last name were omitted due to privacy concerns were treated as a zero.

149.   *See generally* JOSHUA COMENETZ, U.S. CENSUS BUREAU FREQUENTLY OCCURRING SURNAMES IN THE 2010 CENSUS (2016), https://www2.census.gov/topics/genealogy/2010surnames/surnames.pdf [https://perma.cc/T4H2-273C]. The Census Bureau also allows respondents to identify as multi-racial or as American Indian or 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.

150.   Brauneis & Oliar, *supra* note 84, at 58 (using a "governmental six-category taxonomy").

151.   *See generally* Konstantinos Tzioumis, *Demographic Aspects of First Names*, 5 SCI. DATA 1 (2018).

152.   *Id.* Note that self-reporting of racial or ethnic data is accepted in the literature. *See* 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, 62 Fed. Reg. 36,874 (July 9, 1997). *See generally* INST. OF MED. OF

Certain first names are highly specific to one race. For example, the name "Yang" was almost exclusively associated with Asian applicants (99.2%).[153] 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.[154] All applicants in our dataset were coded to reflect the mathematical likelihood that their first name was associated with a person of each race.[155]

The U.S. Census Bureau employed information from the 2000 Census to create a database associating over 160,000 surnames with the probability that an individual identifies as a particular race.[156] 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, while an applicant with the second most common last name ("Johnson") is 61.6% likely to identify as White, there is a 33.8% chance the applicant identifies as Black, 0.4% as Asian, 0.9% as American Indian,[157] and 1.5% as Hispanic.[158]

Using the probability of 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. If the first or last name was not found in the relevant database, the applicant

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THE NAT'L ACADS., RACE, ETHNICITY, AND LANGUAGE DATA: STANDARDIZATION FOR HEALTH CARE QUALITY IMPROVEMENT (Cheryl Ulmer, Bernadette McFadden & David R. Nerenz eds. 2009).

153.   Tzioumis, *supra* note 151 (choose "MS Excel Spreadsheet" from "Access File" dropdown; then choose "Data").

154.   *Id.* This name was not (0%) associated with being multi-racial or American Indian.

155.   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. We note one limitation regarding identification of the likelihood of an applicant identifying as a particular race in this manner. Due to variations in the racial demographics of the United States over time, the likelihood that a particular name is associated with a particular race may vary from year to year. We do not, however, believe this is a substantial source of error.

156.   *Frequently Occurring Surnames from the 2010 Census*, U.S. CENSUS BUREAU (2016), https://www.census.gov/topics/population/genealogy/data/2010_surnames.html [https://perma.cc/3VNE-F5DD] (using File "B: Surnames Occurring 100 or more times" linked to at the bottom of the page); Comenetz, *supra* note 149. Only surnames occurring at least one hundred times in the census were included.

157.   Many persons generally categorized under this term prefer to be known by their tribal nation of origin such as Cherokee, Apache or Sioux. Amanda Blackhorse, *Blackhorse: Do You Prefer 'Native American' or 'American Indian'? 6 Prominent Voices Respond*, INDIAN COUNTRY TODAY (May 22, 2015), https://indiancountrytoday.com/archive/blackhorse-do-you-prefer-native-american-or-american-indian-kHWRPJqIGU6X3FTVdMi9EQ [https://perma.cc/8QDZ-DGMN]. While we acknowledge that preference and hope that future research will delve more deeply into access to intellectual property protection for persons of all of these nations, we employ the broad category of "American Indian" based on published reports of general acceptance of this term as we were conducting our research and to aggregate data from these nations in a manner consistent with sources of name and nation identification derived from U.S. census data. *See Frequently Asked Questions*, NAT'L MUSEUM AM. INDIAN, https://americanindian.si.edu/nk360/faq/did-you-know [https://perma.cc/S95B-LQBG].

158.   "Johnson" is also associated with multi-racial people 1.8% of the time.

was coded as having the demographics associated with the name for which data was available.

For example, an applicant named "Maurice Q. Gray" would be coded as having a probability of being 67.5% White, 27.5% Black, 0.1% Asian, and 2.5% Hispanic by averaging the associations for the first and last names. Data for the middle initial would be ignored. The last name "Skywalker" does not appear in the relevant database. Therefore, an application submitted by a person named "Maurice Q. Skywalker" would be coded using census data correlated with the first name "Maurice." Consequently, in our data, this application would be treated as having a 64% probability of being prosecuted by a White applicant, a 31% chance of being submitted by a Black applicant, 2% by an Asian, and 4% by a person of Hispanic origin. This approach allowed identifying the probability of the race of applicants for 96.8% of all domestic applications filed by one person and for at least one applicant in 97.0% of trademark applications submitted by more than one person.

Our methodology accounted for applications filed by more than one person in the following manner. We calculated the racial probability for each applicant and then weighted each application as if it were filed by one person so as not to give twice as much weight to a single application filed by two persons. For example, if an application was filed by two individuals, one with a 100% likelihood of being White and the other with a 100% likelihood of identifying as Black, the data for that application would be counted as having a 50% likelihood of being filed by a White applicant and 50% by a Black applicant. However, applications were only coded with racial information if data reflective of race was available for at least one applicant. Some names were so rare that no data was available. For example, a person named "saldjfdfj" would not have been coded and counted in our study because no data correlating with race is available for this name.

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 10,526 applicants with no last name race data, the top 10 were: *[no entry]* (46 entries), *robert mcferrin* (24), dor-el (21), fouerti (19), dusanenko (15), cliffords (14), korpman (13), pakter (13), sinek (13), and cohanfard (12), with the italicized entries possibly indicating an error or omission in the application.

C. GENDER

We identified the probability of an applicant's gender using information from Gema Martinez, Julio Raffo, and Kaori Saito's *Identifying the Gender*

of PCT Inventors.[159] 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.[160] 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 92.9% of all applicants and for at least one applicant in 93.3% of all 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 to 2000. Names are considered common (and thus, gender identifying) if they are included in this list. This approach complies with methodologies previously used in the literature.[161]

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.[162]

Application-specific result data was also collected. We coded each

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159.   Martinez et al., *supra* note 64.

160*.   Id.*

161*.   See, e.g.*, Schuster et al., *supra* note 72.

162.   To do this, we matched the exact name of the attorney. This approach may undercount relevant applications if the attorney changed the way they list their name (for example, starts listing a middle initial) but avoids issues in which two attorneys share first and last names but one includes a differentiating name detail (for example, a middle initial) that can be used to distinguish them.

entry for when (and whether) it was filed, published, opposed,[163] and registered (on the supplemental or principal register). Applications were also identified as either an intent-to-use or use-based application. All applications were also coded according to the international class(es) listed on the application. Note that an application was generally treated as a single filing, regardless of how many international classes were claimed.[164]

We recognize multiple limitations with the approach we used. Like a plane flying thousands of feet above the ground, we seek to view the general shapes and contours of the landscape, with the understanding that this level of generality is bound to miss many interesting details. There are multiple nuances to race and gender dynamics that would be fascinating areas of further research. Gender and race are fluid concepts, and some applicants' race and gender identifications may change over time as they self-actualize and uncover ancestral information. Gender and racial perceptions and assumptions by examiners may differ from the self-identification of applicants. Although we do note some preliminary intersectionality of gender and racial probabilities below, we acknowledge that our data does not account for the growing number of persons who identify as multi-racial per se. We attempt to account for this dynamic, however, through our approach of treating each application as having a probability of being submitted by persons of multiple races instead of assigning each applicant as having a unique racial identity.

IV. 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.

However, we expected that the USPTO application and success rates for each group would find that women and minorities are systematically underrepresented vis-a-vis their presence in the population. This pattern would be consistent with those revealed in the patent and copyright studies

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163. An application was deemed to have been opposed if it was coded with the USPTO's "OP.I" code for "OPPOSITION INSTITUTED NO. 999999."
164. Exceptions to this rule are identified herein.

noted above.[165] The patent literature showed greater disparities than the copyright literature, and because 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 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 only partially supports our hypothesis. 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. 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.[166] As such, our study captures only one part of the trademark landscape, as corporate applicants do not 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

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165. This hypothesis, of course, is presented only with regard to individual, domestic applications, as we have no demographic data for nonindividual applications and do not study international applications here.

166. 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 time each application was filed. Studying the gender and race of the applicants' 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.

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
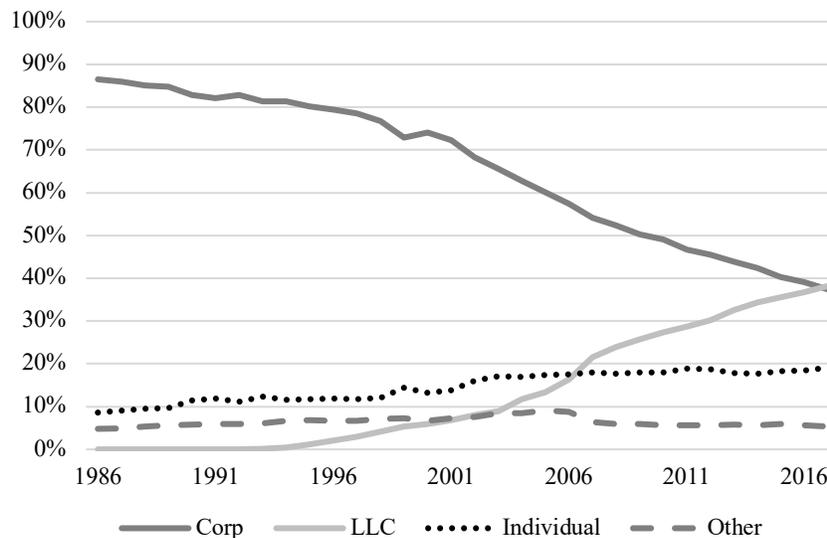
The most dramatic increase reflected in Figure I is seen in the number of applications filed by limited liability companies. A near mirror image of that trend can be seen in the simultaneous decrease in the number of corporations not organized as LLCs. In contrast, the percentage of trademark applications 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 17.1% in 2003 and since then, has hovered between 16–19% 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. Instead of showing the results by percentages, it 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 has been steadily increasing.

FIGURE II. Three Decades of Corporate and Individual Trademark Applications
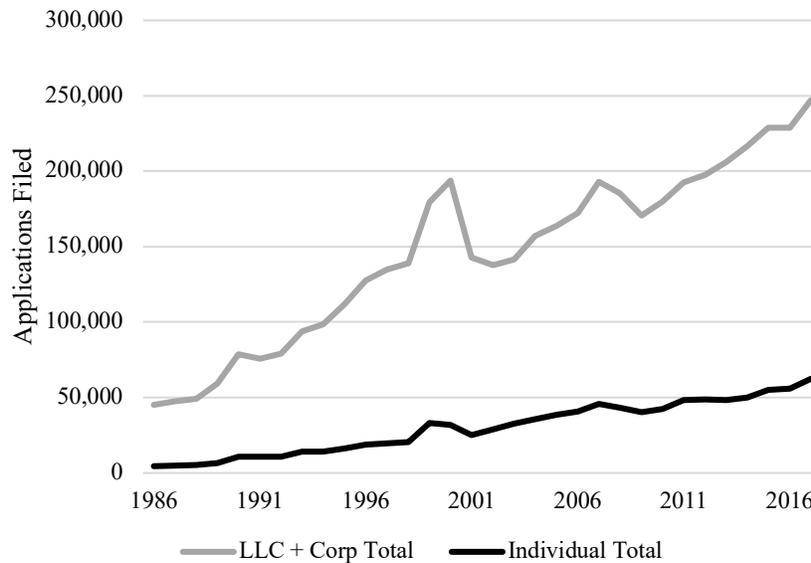
In 1986, 52,214 trademark applications were filed with the USPTO by domestic applicants, and only 4,490 of those were submitted by individuals. By 2018, 337,689 were filed overall, and 64,836 of them were filed by individuals.[167] In three decades, the annual number of trademark applications filed by 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, 1,022,268 applications were filed by individuals. While individual applications constitute only 16.2% 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

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

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.

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. Figure III below shows a steady increase of the percentage of minority applicants over the timeframe of the study. However, as discussed below, Figure III does not present the entire story.

FIGURE III. Percentage of Trademark Applications by Race
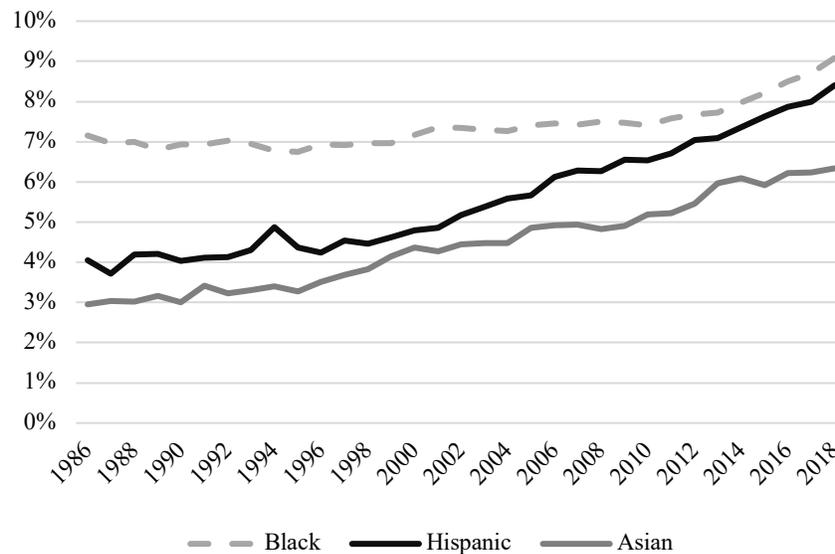
If all races filed trademark applications at the same rate, one would expect the percentage of trademark applications to match each group's percentage of the U.S. population. To get an idea of the trademark activities for each race, the percentage of trademark applications from that race must be compared to its percentage in the overall population. For example, White applicants filed 82.88% of the applications in 1999 but represent only 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% (82.88% / 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,[168] 2010,[169] and an estimate of 2018.[170] 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 8.99% in 1990 to 12.55% in 2000; from this we estimate the Hispanic population in 1995 as 10.77% (that is, half-way between the 1990 and 2000 percentages).

Figure IV 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 applications between 1994–95 and Asian applications between 2014–15) 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.

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168.   *Population by Race*, CENSUSSCOPE, http://www.censusscope.org/us/chart_race.html [https://perma.cc/3Y7P-FLHD].

169.   *Modified Race Data 2010*, U.S. CENSUS BUREAU (2010), https://www.census.gov/data/datasets/2010/demo/popest/modified-race-data-2010.html [https://perma.cc/N8FF-JH24].

170.   *QuickFacts United States*, U.S. CENSUS BUREAU, https://www.census.gov/quickfacts/fact/table/US/PST045218 [https://perma.cc/CL2V-8Y2R].

FIGURE IV. Ratio of Trademark Applications to Percentage of Population by Race
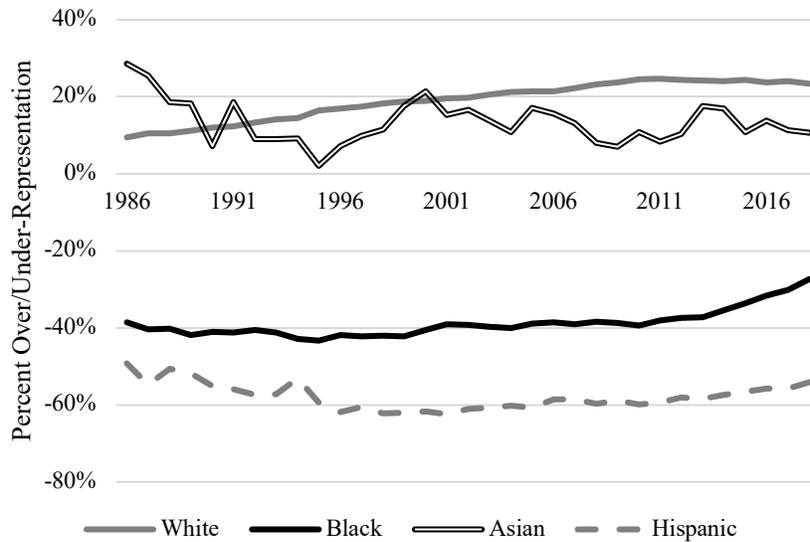
The top two lines show that Whites and Asians are overrepresented within the trademark applicant population, while the bottom two lines indicate that Black individuals and Hispanics are underrepresented. The percentage of White applicants has decreased by approximately 11% during the thirty-year period 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. Black individuals 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 Black individuals 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 29% in 1986 to 11% in 2018. The greatest level of underrepresentation, depicted by the dashed line, remained largely constant among Hispanic applicants, moving from -49% in 1986 to -56% in 2018.

Once all these applications were filed, the aggregate publication and registration rates did not reflect tremendous differences in success, though the statistical significance will be explored via regression subsequently. Between 1986 and 2018, the publication rates were 68.61% (White), 68.10% (Black), 67.07 (Hispanic), and 66.56 (Asian). The registration rates (1986 to 2015) were 46.47% (White), 45.18% (Black), 44.64% (Hispanic), and 45.98% (Asian). The non-White applications that were published increased from 15.2% of all publications filed in 1986 to 25.3% in 2018,[171] and the percentage of non-White applications that were registered increased from 15.2% in 1986 of all registrations to 23.2% for 2015.[172] Across the 1986 through 2015 timeframe, domestic corporate or LLC applications were registered at a rate of 58.38% and the publication rate was 76.35% (1985 to 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 correlates with higher success rates in trademark prosecution,[173] we examined whether applicants of certain races were more or less likely to have their marks filed by a lawyer. The percentage of applicants represented by counsel is never more than 50% for any group of individual applicants, with the rates being 45% for applications likely filed by Hispanics, 44% for Black individuals, 46% for Asians, and 49% 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 percentage 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

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171. Among published applications filed in 2015, 23.3% of individual applications were non-White.
172. 2015 was selected as an end point to allow sufficient time for most applications to go abandoned or be registered.
173. Gerhardt & McClanahan, *supra* note 33, at 620.

it possible to file applications online.[174]

FIGURE V. Percentage of Applications Filed by an Attorney by Race
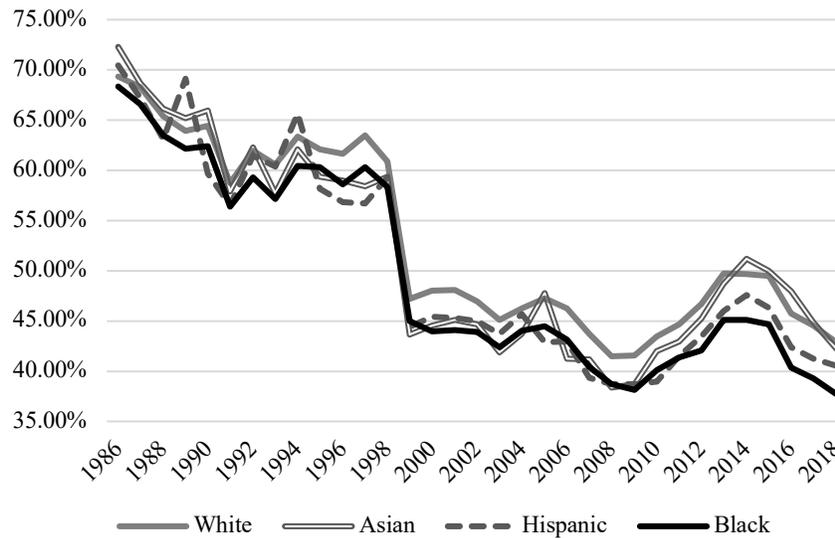

Figure V demonstrates that applications correlated with White and Asian names are more likely to have been filed with the assistance of counsel, while applications likely filed by Black individuals and Hispanic are less likely have had that benefit. However, the percentages exhibit quite a bit of fluctuation from year to year. For example, applications filed by Asians were most likely to have been filed 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 means to quantify market

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174. *Trademarks*, U.S. Pat. & Trademark Off. (1999), https://www.uspto.gov/about-us/performance-and-planning/annual-reports/trademarks [https://perma.cc/BNB6-GKE6] ("In October 1998, we expanded the pilot to make Internet filing available to all customers . . . .").

concentration,[175] but has previously been utilized to measure racial diversity in economic literature.[176] The index is calculated by summing the squares of the market share of each firm in the market.[177] 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;[178] 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 (for example, 25% Hispanic, 25% Black, and so forth).

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 an HHI of 4175 (60.4% White, 12.5% Black, 5.7% Asian, 0.7% American Indian, 2.2% multi-racial, 18.3% Hispanic).[179] 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 (that is, a drop in HHI) over that eighteen-year period.[180]

Figure VI uses the HHI metric to show that the U.S. population[181] 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 1,938) and has slowly begun to diminish. Nonetheless, in 2018, the disparity remained more substantial than it was in 1986.

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175.   Matthew I. Danzig, *China's New Guidelines on the Assessment of the Effect of the Concentration of Business Operators on Competition*, CURRENTS: J. INT'L ECON. L. 24, 27 (2012).

176.   *See* Jessica B. Weiss & Paul M. Sommers, *Does Team Racial Composition Affect Team Performance in the NBA?*, 37 ATL. ECON. J. 119, 119–20 (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*, 43 ETHNIC & RACIAL STUD. 2099, 2104 (2019).

177.   Danzig, *supra* note 175, at 27.

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

179.   U.S. CENSUS BUREAU, *supra* note 170.

180.   CENSUSSCOPE, *supra* note 168 (2000 was chosen here for a 1:1 comparison, as it is the first year to include multi-racial as a category).

181.   Note that the racial demographics of the U.S. population was taken from the decennial census, with the racial breakdown of years between censuses linearly estimated therefrom.

FIGURE VI. Racial HHI by Year
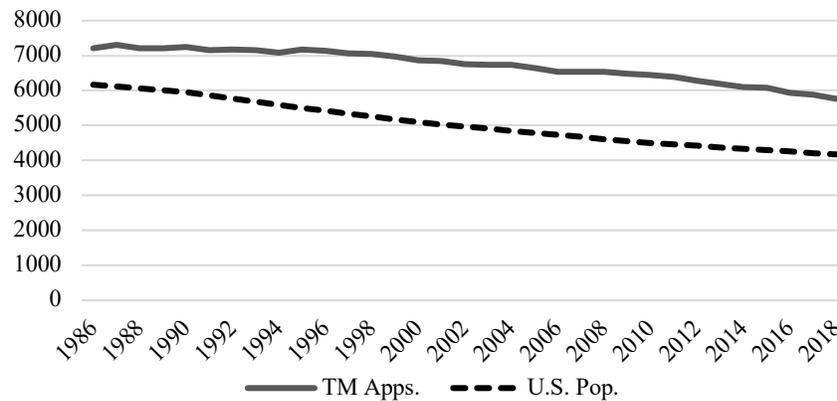
Figures VII and VIII separate out the HHI by international class. Each trademark application is filed for one or more particular goods or services.[182] The following two charts show a rough approximation of industry categories that are more or less diverse.

FIGURE VII. Racial HHI by International TM Class in 2017
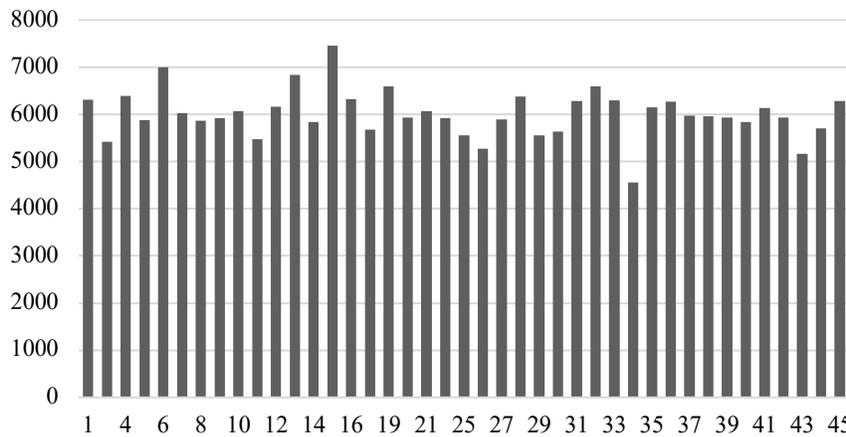
182. For a complete list of categories, see *International Trademark Classes*, OPPEDAHL, https://www.oppedahl.com/trademarks/tmclasses.htm [https://perma.cc/YB4D-T7DK]. Note that for the HHI calculation, an application is considered to be part of each class it is filed in.

Figure VII, depicting the HHI for applications filed in 2017, shows that classes thirty-four (Smokers' articles - 432 filings, 4569 HHI) and forty-three (Hotels and Restaurants - 2089 filing, 5169 HHI) were the most diverse. Classes fifteen (Musical Instruments - 156 filings, 7458 HHI) and six (Metal goods - 248 filings, 7004 HHI) were the least diverse. The finding for Class fifteen was particularly interesting given the predominance of Black and Latinx authors in copyrighted musical works.[183]

FIGURE VIII. Racial HHI by International TM Class (1986–2018)
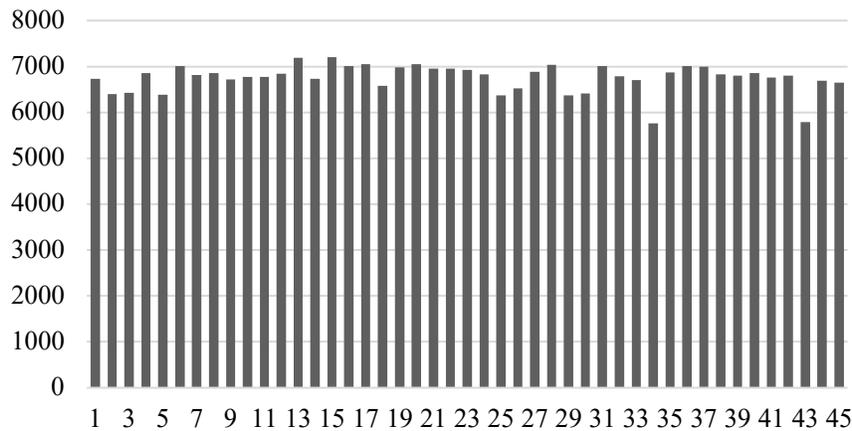
Figure VIII aggregates the HHI data by class from 1986 to 2018. Consistent with the snapshot depicted in Figure V (for 2017), we see that classes thirty-four and forty-three are the most diverse. In this larger dataset, class fifteen remains the least diverse.

With regard to oppositions, the rate of opposition for published applications was largely consistent among applications correlated with different races. Across the cadre, opposition rates were: White (2.01%), Black (1.99%), Hispanic (2.14%), and Asian (2.27%). 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

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183.   Brauneis & Oliar, *supra* note 84, at 63.

U.S. population.[184] 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 persons identify as either male or female.[185] 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 hope that individual trademark applications filed by women would track their percentage in the U.S. population. The data unequivocally disprove that theory. In 1986, 23.9% of domestic, individual applicants for whom gender data was available were filed by women.[186] Over time, the gender disparity dissipated somewhat. The percentage of female applicants rose to 32.1% by 2018. Our findings are consistent with prior research conducted in 2012.[187]

Pursuant to the methodology explained above, for gender identification, we counted applications only if the gender of at least one applicant could be identified. Consequently, our study excludes some applications for each year, amounting to 5.0% 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. Others were omitted because the first names of the applicants were gender neutral.[188] For the vast majority of applications which did yield gender identifying information, Figure VII displays the percentage of applicants filed over time. The lower solid portion shows the decreasing number of male applicants while the upper striped portion shows the increasing percentage of women in the population of trademark applicants.

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184.   Women made up 51.3% of the U.S. population in 1990, 50.9% in 2000, and 50.8% in 2010. DENISE I. SMITH & RENEE E. SPRAGGINSM, U.S. CENSUS BUREAU, GENDER: 2000 (2001), https://www2.census.gov/library/publications/decennial/2000/briefs/c2kbr01-09.pdf [https://perma.cc/A29W-EWQZ]; LINDSAY M. HOWDEN & JULIE A. MEYER, U.S. CENSUS BUREAU, AGE AND SEX COMPOSITION: 2010 (2011), https://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf [https://perma.cc/P8HP-TBB7].

185.   NAT'L LGBTQ TASK FORCE, THE NATIONAL LGBTQ TASK FORCE'S GUIDE TO THE 2020 CENSUS: AN INTRODUCTION, https://www.thetaskforce.org/wp-content/uploads/2019/05/Guide-to-the-2020-Census-An-Introduction.pdf [https://perma.cc/M42S-NT8M].

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

187.   NAT'L WOMEN'S BUS. COUNCIL, *supra* note 120, at 99.

188.   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).

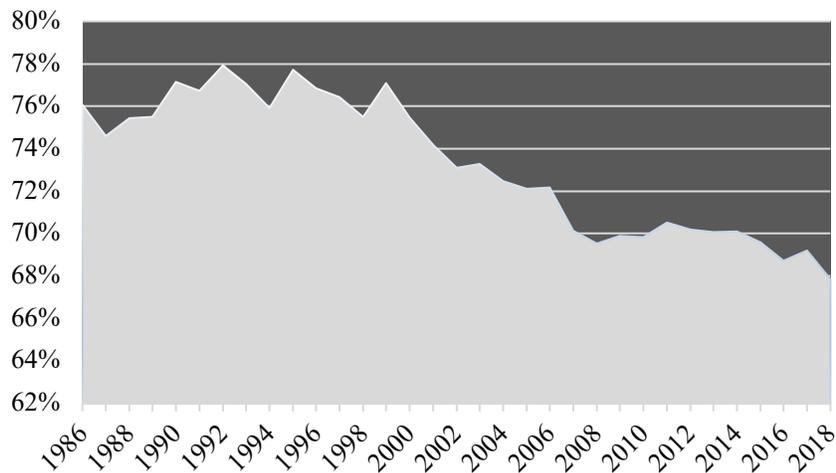FIGURE IX. Percentage of Applicants by Gender over Time

Figure IX also demonstrates that men have filed many more trademark applications than women since 1986 (falling from ~76% to ~68% in 2018). The trend over the thirty-year period reflects a clear majority of male applicants for the entire period; however, the magnitude has diminished over time. The data demonstrate a constant albeit moderate decline in the number of male applications from more than 75% to less than 68%. From 1986 to 2000, men filed three out of every four applications. By 2001, the percentage of male applicants dipped below 75% for the first time. The percentage of male filers dropped 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, notwithstanding their relative parity in the general population.[189]

Figure X depicts the success rates of male and female domestic trademark applicants over time. The grey dotted line shows publication success rates for women, and the grey solid line shows registration rates. Similarly, the black dotted line depicts the male publication rate, while the black solid line depicts the male registration rate.[190]

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    189.   This does not consider applications filed by men or women through business entities, as applications filed by nonindividuals were not included in our dataset. This may warrant future research.
    190.   Note that for a few years early in this dataset, the registration rate is greater than the publication rate. This is because some applications were never published but would still be registered on the supplemental register. Also, note that this only includes applications that are identified as 100% male or

FIGURE X. Publication and Registration Rates over Time by Gender
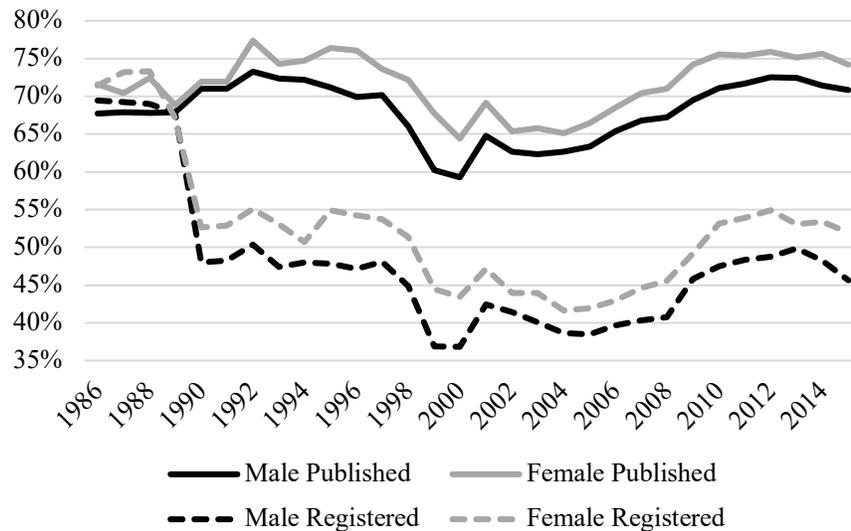
Figure X depicts one of the most significant findings of our research. As noted above, the percentage of women who file trademarks is substantially lower than men. When women do seek to protect their trademarks by applying to register marks with the USPTO, two significant metrics indicate that they succeed more frequently than their male peers.[191] 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 application was 100% female or male.

In prosecuting a trademark application, the first measure of success is publication, marking the moment when the USPTO approves the application. Because two-third 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 thirty-year 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 0.93% (1991) and 7.47% (1999), with the annual difference averaging to 3.65%.

100% female.

191. This finding is consistent with one prior non-academic study. *See* NAT'L WOMEN'S BUS. COUNCIL, *supra* note 79, at 96. This prior work analyzed sole proprietors *and* individual applicants without limiting the dataset to domestic applicants and it used other data sources for its analysis. *Id.* at 7–9, 33. Both of these factors may account for some variations in findings.

Publication opens a thirty-day window when marks may be opposed by third parties. Approximately 3% of published applications are subject to such challenges, and therefore, the vast majority of published marks that were based on actual use in commerce 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. This difference results from a change to trademark registration practices in 1989 when the Lanham Act was amended to permit applicants to seek registration based on a good faith intent-to-use a mark even if use had not yet begun. For these applications, the USPTO issues a notice of allowance after publication, opening a six-month window in which the applicant may file a statement indicating that it has begun using the mark in commerce. The USPTO will register the mark only after the applicant files a satisfactory statement demonstrating use of the mark in commerce.

Figure X shows a similar pattern for registration rates. Again, women succeeded more than men, although men did succeed in registering 0.5% more of their marks than women in 1989, at a male rate of 67.7% compared to the women's success rate of 67.2% that year. Overall, 49.6% of marks filed by women proceeded to register compared to 44.8% of marks filed by men. On annual average, women succeeded in registering their marks 4.60% 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 (for example, likelihood that 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 attorney 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.[192] A substantial portion of this drop occurred around October 1998, when the Trademark Office began accepting online applications.[193] From 1997 to 1999, the overall rate of attorney representation within our cadre dropped by 16.2%—accounting for more than half of the observed reduction over the thirty-two-year period studied as shown below. The gender-specific representation rate was similar by 2018 (women were 2.3% more likely to have an attorney), with male and female representation rates dropping by 28.5% and 23.0% during our study period, respectively.[194]

Regarding oppositions, the rate of opposition for published applications is different between the genders by over half of a percent, with women having oppositions filed against them less often. Across the cadre (1986 to 2015), opposition rates were: women (2.65%) and men (3.37%). These rates are further explored in the regression analysis section.

Lastly, it is notable that we observed a substantial difference in the registration success rate by attorney gender. For domestic individual filings between 1986 and 2015 (inclusive), female attorneys secured registration 57.29% of the time, compared to 53.49% for male attorneys.[195]

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 0.50 means that the application is 50% less likely to register.[196] Given the binary nature of the independent variables analyzed, logistic regressions were employed.[197]

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192. *See supra* Figure V.

193. U.S. PAT. & TRADEMARK OFF., *supra* note 174.

194. Another interesting finding involved the percentage of applications filed by two persons who were of different genders. We evaluated the gender-pairings of two individual-applicant filings from the United States. These applications comprised 7.1% (72,733 total) of individual applications from 1986–2018. Of this group, 63,863 applications (87.8%) had gender data for both applicants (127.726 total applicants). The group included 47,382 women (37.1%) and 80,344 men. The pairings were women-women (13.0%), men-women (48.1%), and men-men (38.9%).

195. Additionally, for domestic individual filings between 1986–2015 (inclusive, for which examiner gender was available), female examiners registered 45.56% of applications, compared to 46.47% for male examiners.

196. A sub-one odds ratio indicates a lower chance of the dependent variable occurring. For example, and odds ratio of 0.50 indicates that if this particular independent variable is 1, then the dependent binary variable is 50% less likely to be positive (to equal 1).

197. *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,

1. Registration

Model 1 in Table 1 evaluated the registration outcomes (registered or not) for applications filed before 2016. 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.

Model 2 included a continuous variable (0–1) representing the percentage of individual applicants that were identified as male. Consistent with our descriptive results, 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.[198] 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 thirty applications filed).[199] This independent variable had an odds ratio of 1.10 which was 99.9% statistically significant. Several unreported models verified the findings' robustness.[200]

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is generally preferred when the independent variable is categorical or binary.").

    198.   Note that Models 3–7 were also run without controlling for gender. Results were largely the same: White – 1.10 (0.012)***; Black – 0.80 (0.020)***; Asian 1.05 – (0.017)***; and Hispanic – 0.89 (0.014)***.

    199.   The thirty-application threshold for an experienced attorney was adopted from prior work. *See* Gerhardt & McClanahan, *supra* note 33, at 611.

    200.   Recognizing that an application may include multiple international classes, Table 1 controlled for the maximum class claimed (by class number). An unreported model version of Model 3 controlled for the minimum class claimed. Results were largely the same: attorney – 1.89 (0.009)***; male – 0.82 (0.004)***; White – 1.08 (0.013)***. Another unreported model replaced the five-year filing periods controlled for in Table 1 with dummy variables for each filing year. An unreported version of Model 3 had similar results: attorney – 1.88 (0.009)***; male – 0.82 (0.004)***; White – 1.08 (0.013)***. A third unreported model removed all applications that were registered on the supplemental register; all relevant findings were consistent with Table 1.

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	1.9 (0.009)***	1.88 (0.009)***	1.88 (0.009)***	1.88 (0.009)***	1.88 (0.009)***	1.88 (0.009)***
Male	. . .	0.82 (0.004)***	0.82 (0.004)***	0.82 (0.004)***	0.82 (0.004)***	0.82 (0.004)***
White	. . .	. . .	1.08 (0.013)***	. . .	. . .	. . .
Black	. . .	. . .	. . .	0.79 (0.021)***	. . .	. . .
Asian	. . .	. . .	. . .	. . .	1.08 (0.02)***	. . .
Hispanic	. . .	. . .	. . .	. . .	. . .	0.9 (0.015)***
Filed 1986–1990	1.88 (0.024)***	1.9 (0.025)***	1.9 (0.025)***	1.9 (0.025)***	1.9 (0.025)***	1.9 (0.025)***
Filed 1991–1995	1.12 (0.01)***	1.14 (0.011)***	1.14 (0.011)***	1.14 (0.011)***	1.14 (0.011)***	1.14 (0.011)***
Filed 1996–2000	0.88 (0.007)***	0.9 (0.007)***	0.9 (0.007)***	0.9 (0.007)***	0.9 (0.007)***	0.9 (0.007)***
Filed 2001–2005	0.84 (0.006)***	0.86 (0.006)***	0.86 (0.006)***	0.86 (0.006)***	0.86 (0.006)***	0.86 (0.006)***
Filed 2006–2010	referent	. . .	. . .	. . .	. . .	. . .
Filed 2011–2015	1.24 (0.007)***	1.23 (0.008)***	1.23 (0.008)***	1.23 (0.008)***	1.23 (0.008)***	1.23 (0.008)***
46 Dummy Variables for International Classes						
Constant	0.62 (0.021)***	0.76 (0.027)***	0.72 (0.027)***	0.77 (0.028)***	0.76 (0.028)***	0.76 (0.028)***
	n = 839,352	n = 786,122	n = 776,156	n = 776,156	n = 776,156	n = 776,156

***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 2016 to ensure ample time for an opposition to be filed. Model 7 in Table 2 analyzes whether an application was opposed (the dependent variable) controlling for attorney representation, international class, and year filed. Model 8 adds gender data; it finds that male applicants are significantly more likely to have an opposition filed.

Models 9 to 12 add race data for applications likely to have been filed by White, Black, Asian, and Hispanic applicants, respectively.[201] It finds that applications associated with White persons are statistically significantly less likely to encounter a third-party opposition. Applications correlated with Black names are not significantly more or less likely to face an opposition, and Asian and Hispanic applicants are 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 [0.76 (0.041)***], Black [0.85 (0.113)], Asian [1.45 (0.116)***], and Hispanic [1.26 (0.09)**]. Accordingly, regardless of how attorney-representation was accounted for, the results were largely the same for all racial and ethnic minorities.

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201.   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 0.78 (0.028)***, as opposed to 0.80 (0.031)*** when gender was controlled for.

TABLE 2. Opposition Rates by Gender and Race

	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Logistic Regression Presented Using Odds Ratios						
Attorney	0.97 (0.015)	0.97 (0.015)	0.98 (0.016)	0.97 (0.016)	0.98 (0.016)	0.98 (0.016)
Male	. . .	1.23 (0.023)***	1.23 (0.024)***	1.23 (0.024)***	1.23 (0.024)***	1.23 (0.024)***
White	. . .	. . .	0.8 (0.031)***	. . .	. . .	. . .
Black	. . .	. . .	. . .	0.88 (0.081)	. . .	. . .
Asian	. . .	. . .	. . .	. . .	1.41 (0.082)***	. . .
Hispanic	. . .	. . .	. . .	. . .	. . .	1.17 (0.06)**
Filed 1986–1990	1.2 (0.047)***	1.17 (0.047)***	1.18 (0.047)***	1.18 (0.047)***	1.18 (0.047)***	1.18 (0.047)***
Filed 1991–1995	1.26 (0.036)***	1.24 (0.037)***	1.25 (0.037)***	1.24 (0.037)***	1.25 (0.037)***	1.24 (0.037)***
Filed 1996–2000	0.99 (0.026)	0.98 (0.026)	0.99 (0.027)	0.99 (0.027)	0.99 (0.027)	0.99 (0.027)
Filed 2001–2005	referent	. . .	. . .	. . .	. . .	. . .
Filed 2006–2010	0.77 (0.018)***	0.78 (0.019)***	0.78 (0.019)***	0.78 (0.019)***	0.78 (0.019)***	0.78 (0.019)***
Filed 2011–2015	0.7 (0.016)***	0.7 (0.016)***	0.69 (0.016)***	0.7 (0.016)***	0.7 (0.016)***	0.7 (0.016)***
46 Dummy Variables for International Classes						
Constant	0.03 (0.004)***	0.02 (0.003)***	0.03 (0.004)***	0.02 (0.003)***	0.02 (0.003)***	0.02 (0.003)***
	n = 577,412	n = 543,899	n = 537,339	n = 537,339	n = 537,339	n = 537,339

***$p<0.001$, **$p<0.01$, *$p<0.05$ Standard errors are displayed in parentheses.

Models 9 to 12 show us that White applicants are less likely to have their applications opposed, while Asian and Hispanic applicants 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 whether applications filed by different race or gender groups are being disproportionately opposed. We conducted this inquiry 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 method allows us to identify demographic attributes associated with having an unsuccessful opposition filed. Again, only applications filed before 2015 were analyzed.

Model 13 in Table 3 shows 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 an unsuccessful opposition filed against the application. This is likely due to the attorney helping the applicant win the opposition (and thus, establish it as unsuccessful). Model 14 added gender data, finding that male applicants were statistically significantly more likely to have their applications opposed.

Models 15 to 18 controlled for racial attributes, with mixed findings.[202] Consistent with expectations from earlier models (for example, Hispanic applicants had less success in trademark prosecution and Asian applicants had more), Hispanic applicants were statistically significantly more likely to have an unsuccessful opposition filed against them. Likewise, Asian applicants were statistically significantly less likely to face an unsuccessful opposition. Both findings were significant only to 95%. No significant findings were observed for applications from White or Black applicants.

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202. 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. Unsuccessful Opposition Rates by Gender and Race

	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18
Logistic Regression Presented Using Odds Ratios						
Attorney	1.45 (0.048)***	1.45 (0.05)***	1.45 (0.05)***	1.45 (0.05)***	1.45 (0.05)***	1.45 (0.05)***
Male	. . .	1.14 (0.044)**	1.14 (0.044)**	1.14 (0.044)**	1.14 (0.044)**	1.13 (0.044)**
White	. . .	. . .	0.98 (0.082)	. . .	. . .	. . .
Black	. . .	. . .	. . .	0.91 (0.177)	. . .	. . .
Asian	. . .	. . .	. . .	. . .	0.76 (0.107)*	. . .
Hispanic	. . .	. . .	. . .	. . .	. . .	1.28 (0.136)*
Filed 1986–1990	0.93 (0.069)	0.9 (0.07)	0.9 (0.07)	0.9 (0.07)	0.9 (0.07)	0.9 (0.07)
Filed 1991–1995	1.22 (0.071)***	1.21 (0.072)**	1.22 (0.072)**	1.21 (0.072)**	1.21 (0.072)**	1.22 (0.072)**
Filed 1996–2000	0.99 (0.053)	1.01 (0.055)	1.02 (0.056)	1.02 (0.055)	1.02 (0.055)	1.02 (0.056)
Filed 2001–2005	referent	. . .	. . .	. . .	. . .	. . .
Filed 2006–2010	0.76 (0.037)***	0.77 (0.039)***	0.77 (0.039)***	0.77 (0.039)***	0.78 (0.039)***	0.77 (0.039)***
Filed 2011–2015	0.01 (0.002)***	0.63 (0.031)***	0.62 (0.031)***	0.62 (0.031)***	0.62 (0.031)***	0.62 (0.03)***
46 Dummy Variables for International Classes						
Constant	0.01 (0.007)***	0.01 (0.002)***	0.01 (0.002)***	0.01 (0.002)***	0.01 (0.002)***	0.01 (0.002)***
	n = 364,975	n = 343,722	n = 339,672	n = 339,672	n = 339,672	n = 339,672

***p<0.001, **p<0.01, *p<0.05 Standard errors are displayed in parentheses.

We also ran a second series of regressions controlling for attorney representation by evaluating only registered applications with attorney representation. The findings were similar to the above. Regression results were: male [1.19 (0.058)***], White [0.95 (0.100)], Black [0.89 (0.225)], Asian [0.74 (0.135)], and Hispanic [1.36 (0.180)*]. 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 (for example, they had a feminine-sounding name).[203] 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 two 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.

Consistent with past studies,[204] 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's dataset for identifying gender. 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 to 2000.

Given the breadth of Martinez, Raffo, and Saito's dataset, 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,"

203*.*   *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.

204*.*   *Id.* at 307; Schuster et al., *supra* note 71.

"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 21,807 applications with 2,243 female applicants with rare, androgynous names filed in 1986 to 2015. We created a dummy variable for whether the applicant had a rare name or not.

We ran logistic regressions with the dependent variable being whether an application was published, controlling for international class, attorney representation, and year filed (broken into five-year segments). Our analysis found that the androgynous name was not statistically significant. For robustness purposes, we also ran the analysis looking only at applications filed by counsel 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.

Both of the above analyses (publication and opposition) were likewise run for a cadre of 49,539 male applicants with 7,408 gender non-identifying names. Logistic regression again found no evidence of bias in publication or opposition rate.[205]

C. THE STUDY'S MAJOR FINDINGS

While the majority of trademark applications are filed by organizational entities, our study focuses on the gender and racial dynamics at the individual-applicant level. This provides a window into entrepreneurial activity by individual enterprises. Our data shows that although men have filed many more trademark applications, female applicants secure federal registration at a higher rate than men. With respect to race, White and Asian applicants are overrepresented within the trademark applicant population while Black and Hispanic applicants are underrepresented. Over time, women and minorities have been underrepresented, but the disparity is decreasing at a rate not seen in other IP registration systems. The greatest level of underrepresentation remained constant among Hispanic applicants. The registration rates among individual applicants by race found significant difference, with Black and Hispanic applicants less likely to secure a registration. Descriptive data found women, White, and Asian applicants are

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205.   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.

more likely to prosecute trademarks with the assistance of counsel while men, Black and Hispanic applicants are less likely.

Our regression analysis confirmed that male applications were statistically significantly less likely to secure a registration and more likely to face an opposition proceeding. Asian and Hispanic applicants were more likely to have an opposition filed against them, with Hispanic applicants being more likely to overcome an opposition filed against them. All applicants represented by counsel were more likely to succeed in registering their marks.

Importantly, unlike prior research on patent applicants at the USPTO which found a negative bias to exist in examination of applications filed by women, our study found no evidence of such bias. The data showed other interesting patterns with respect to gender. Women examiners were less likely to approve a mark for registration than their male colleagues, and women lawyers were more likely to succeed in obtaining registration for their clients.

V. IMPLICATIONS

These findings open multiple paths for additional research. Future work may explore the reasons for the disparities we identify between different groups of trademark applicants, finding ways to test these findings among corporate applicants and explaining the differences between the dynamics reflected in trademark prosecution compared to copyright and patents. To lay the foundation for that future work, this section suggests initial explanations and possible implications for our findings.

Trademarks may be used to prevent competitors from using one's distinctive symbols in a way that will cause confusion. Courts describe the twin goals of trademark law as avoiding protecting producer good will and minimizing consumer confusion.[206] In economic terms, trademarks are perceived as rights that contribute to economic efficiency by reducing consumer search costs.[207] Trademarks symbolize source, quality, and

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206. *See, e.g.*, Park 'N Fly, Inc. v. Dollar Park & Fly, Inc., 469 U.S. 189, 198 (1985) (noting that the goal of trademark protection is "to protect the ability of consumers to distinguish among competing producers"); Ty Inc. v. Perryman, 306 F.3d 509, 510 (7th Cir. 2002) (Posner, J.) (noting that the central concern of trademark law is to provide consumers with "a concise and unequivocal identifier of the particular source of particular goods").

207. *See* WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 167–68 (2003); Nicholas S. Economides, *The Economics of Trademarks*, 78 TALENT MED. RSCH. 523, 525–27 (1988) (discussing the economic benefits of marks that apprise consumers of the unobservable features of products); Nicholas S. Economides, *Trademarks*, *in* 3 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 602 (Peter Newman ed. 1998) (describing the savings for consumers in product searches as one of "[t]he primary reasons for the existence and

corporate values, allowing consumers to use them as informational shorthand in a competitive market.[208]

The underrepresentation of women and minorities in the trademark registration system should be the subject of future research. Diversity amongst trademark registrants should be advanced as an important value within trademark theory. To advance that goal, scholars should investigate the causes of underrepresentation, which may include differential access to capital, counsel, business organizational assistance, or the trademark system. To combat systemic racism, trademark economic theory should support greater diversity and inclusiveness to achieve greater representation in intellectual property prosecution. When minorities are underrepresented in an applicant pool or experience challenges which stem from either their race or gender, targeted research could illuminate systemic forces that make our market economy for goods and services inequitable. Identifying these forces will be an important preliminary step in assuring that racial and gender representation continues to increase until trademark prosecution rates for each underrepresented group approach more closely that group's percentage of the population.

In cases of substantial disparities in trademark participation among various demographic groups, trademark law should be informed by policies that promote diversity and reduce barriers to minority entry. If the world of commerce is to be equitable and inclusive, trademark prosecution must mirror those values by providing all applicants with equal access to the benefits of trademark registration. The more homogenous trademark applicants are as a group, the more urgent the call for enhanced diversity.

Women, Black, and Hispanic applicants are significantly underrepresented. The USPTO should consider policies that would increase female, Black, and Hispanic participation, as well as other substantially underrepresented demographics.

To advance that goal, the USPTO could assist in gathering more information in order to get a more complete and accurate sense of trademark registrants' demographics. For example, the USPTO, for both corporate and individual applications could provide a means for applicants to self-identify by race or gender or they could survey applicants or registrants for such information. Further research could also explore variables such as wealth, class, or education level.

Given the racial and gender disparities uncovered in our data, the

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protection of trademarks").

208. *See* HAL R. VARIAN, MICROECONOMIC ANALYSIS 82 (2d ed. 1984) (describing "perfect information" as one of the characteristics of a competitive market).

USPTO may periodically study trends in underrepresentation to confirm that representation levels continue to advance towards population parity. It could allocate funds for outreach to members of underrepresented groups, seeking to explain and promote the benefits of registration. Some of this outreach could be accomplished with the help of law school clinic pro bono services to low-wealth entrepreneurs. Race-conscious marketing efforts have been implemented by the Department of Housing and Urban Development under the Fair Housing Act,[209] and a number of courts have upheld them.[210]

Our findings have implications beyond trademark law and prosecution. The increase in overrepresentation of White registrants paired with a significant underrepresentation of women, Black, and Hispanic applicants is a warning signal. It suggests that policies outside of trademark law—such as labor, employment, health, education, housing, fiscal, and tax policies—may be impacting trademark prosecution rates. The demographic disparities in other areas of IP provide additional evidence that the sources of these inequities are ripe for review.

Trends in relying on federally registered versus common law protection is another major inquiry that should be explored empirically. Many proxies for business existence, such as trade license registration or advertising, may be used to obtain an estimate of individuals and corporations that understand and rely on the benefits of federal protection. Arguably, the common law recognition of unregistered trademark rights is more equitable because trademark protection attaches automatically once certain threshold requirements are met. Common law protection does not require any costs in the form of filing fees or attorney costs. However, reliance on such rights requires knowledge, and even with that knowledge, common law protection provides inferior protection compared to rights that accompany federal registration.

Other sources of studying common law trademarks are federal and state judicial decisions which adjudicate matters on both types of marks. That particular universe will also have its limitations as it would encompass only those with sufficient capital to litigate a claim in court.

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209. 42 U.S.C. §§ 3601–3619; *see* 24 C.F.R. § 200.610 (2021) ("Each applicant for participation in FHA subsidized and unsubsidized housing programs shall pursue affirmative fair housing marketing policies in soliciting buyers and tenants . . . ."); *id.* § 200.620(a) (requiring applicants to FHA housing programs to "publiciz[e] to minority persons the availability of housing opportunities . . . .").

210*.   See, e.g.*, S.-Suburban Hous. Ctr. v. Greater S. Suburban Bd. of Realtors, 935 F.2d 868 (7th Cir. 1991); Steptoe v. Beverly Area Plan. Ass'n, 674 F. Supp. 1313 (N.D. Ill. 1987). Note, however, that classifications based on immutable characteristics, and on ethnicity or race in particular, will probably face constitutional challenges. *See, e.g.*, Fisher v. Univ. of Tex. at Austin, 136 S. Ct. 2198, 2210, 2214–15 (2016) (upholding affirmative action program at public university and explaining that the University must ensure that race plays no greater role than is necessary to meet its compelling interest).

The United States is not alone in having widespread usage of the trademark system. Indeed, trademark registration is common worldwide.[211] Policymakers could learn much by examining how trademark registrants' demographics in the United States compare with those abroad. A comparative look may enable policymakers to assess factors internal as well as external to trademark law on the participation of registrants from various demographics.

As mentioned earlier, our data presents reasons for the USPTO to systematically collect more demographic information about trademark applicants, including ethnicity, race, gender, as well as other data such as education, income, and others. Because the trademark application data reflect the addresses of owners, that address data could be compared to data indicating average income by zip code. The USPTO periodically surveys applicants and their counsel about various features of the online registration system. Such data collection may seek additional information from those who fail to succeed in the registration process to better understand the hurdles they faced, including the challenges of navigating the online registration system and access to counsel.

One of the interesting findings of our study is that there appears to be no institutional bias in the USPTO against women during the trademark examination process. This finding sits in stark contrast with Jensen and Schuster's studies which found bias against women in patent examination. Explaining that difference will be a fertile ground for further research. We lack strong empirical findings regarding why different groups, such as particular racial or ethnic groups, are underrepresented in different IP registries, including in the patent, copyright, and trademark area. Moreover, we do not know empirically what variables contribute to the systemic underrepresentation we identified. However, as Marcowitz-Bitton and Emily Michiko Morris argued elsewhere, registries provide a convenient platform for discriminatory effects, particularly in combination with the vague and often complex standards for registering IP rights, the incentives and potential biases among the agencies that administer those registries, and the relatively limited role that courts play in monitoring those agencies.[212] And beyond

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211. *See, e.g.*, World Intell. Prop. Org. [WIPO], *Madrid Agreement Concerning the International Registration of Marks (as amended on September 28, 1979) (Official Translation)* (Apr. 14, 1891), https://wipolex.wipo.int/en/text/283529 [https://perma.cc/Q29R-RRDG] (displaying the official English translation of the Madrid Agreement); S*ummary of the Madrid Agreement Concerning the International Registration of Marks (1891) and the Protocol Relating to that Agreement (1989)*, WORLD INTELL. PROP. ORG., https://www.wipo.int/treaties/en/registration/madrid/summary_madrid_marks.html [https://perma.cc/GXJ4-CYXJ].

212. *See generally* Miriam Marcowitz-Bitton & Emily Michiko Morris, *The Distributive Effects of IP Registration*, 23 STAN. TECH. L. REV. 306 (2020).

future exploration of mechanisms underlying our findings, there are robust questions regarding what our research means to the business realm. A few such questions are addressed below.

A. DIVERSITY AMONG TRADEMARK APPLICANTS AND MARKET COMPETITION

Informational diversity positively correlates with group performance and innovation.[213] Where actors come from diverse backgrounds, each brings their own idiosyncratic perspective on how to address particular issues.[214] Diverse groups of businesspeople can see more perspectives and therefore are able to find a broader scope of creative solutions to the problems facing their market. Due to this dynamic, diversity enhances efficiencies.[215] Our findings regarding racial diversity—as shown through HHI indices in certain international trademark classes—raise interesting questions regarding competition and innovation in low-HHI (highly diverse) markets.

Within the scope of domestic, individual trademark applicants, international classes thirty-four (Smokers' articles) and forty-three (Hotels and Restaurants) stood out as the most racially diverse markets by HHI.[216] Recognizing that diverse backgrounds lead to exploration of varied approaches to competitive advantage, it could by hypothesized that these low-HHI markets will exhibit relatively fast evolution and movements towards efficiency. This expectation should be explored and empirically tested through future research.

B. MIXED FINDINGS AMONG RACIAL FILING TRENDS

Our findings regarding filing trends by applicant race tell two distinct stories. When viewed by percentage of applications by domestic individuals, the percentages of all minority groups (that is, Black, Asian, and Hispanic) increased from 1986 to 2018.[217] However, when compared to each racial

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213.   Karen A. Jehn, Gregory B. Northcraft & Margaret A. Neale, *Why Differences Make a Difference: A Field Study of Diversity, Conflict, and Performance in Workgroups*, 44 ADMIN. SCI. Q. 741, 753 (1999).

214.   Lu Hong & Scott E. Page, *Group of Diverse Problem Solvers Can Outperform Groups of High-Ability Problem Solvers*, 101 PROC. NAT'L ACAD. SCI. 16,385, 16,385–86 (2004).

215.   *Id.*; *see also* Michele DeStefano, *Nonlawyers Influencing Lawyers: Too Many Cooks in the Kitchen or Stone Soup?*, 80 FORDHAM L. REV. 2791, 2804–05 (2012); Charles A. O'Reilly, III, Katherine Y. Williams & Sigal Barsade, *Group Demography and Innovation: Does Diversity Help?*, *in* RESEARCH ON MANAGING GROUPS AND TEAMS 183 (Margaret A. Neale, Elizabeth A. Mannix & Deborah H. Gruenfeld eds., 1998).

216.   *See supra* Figures VII and VIII.

217.   *See supra* Figure IV.

group's representation in the population, these increases are not as robust.[218] In fact, the percentage of trademark applications filed relative to the proportion of the U.S. population has actually decreased for minority applicants. Viewed from a social justice perspective, the decreasing representation of minority applicants (on a per capita basis relative to the citizenry at large) is troubling. This increasing level of underrepresentation for minority applicants cuts against social justice goals like inclusion and entrepreneurial empowerment.[219] To the extent trademark registration is indicative of small business participation, the data show an increasing level of participation (and potentially exclusion) for some segments of society.

This negative social justice finding stands in contrast to an opposite conclusion associated with business outcomes. While the level of racial diversity in trademark activity has decreased relative to the U.S. population, the net diversity (for example, as shown through racial HHI[220]) has increased, such that larger groups, representing differing opinions and backgrounds, are now represented. Assuming this gross increase in trademark diversity positively correlates with an increased diversity in small business engagement, it may facilitate innovation and efficiency of firms within these markets.[221] These gains should facilitate inter-firm competition and impel pro-social effects (for example, lower prices, better quality goods, and so forth).[222]

CONCLUSION

Three decades of individuals trademark applications reflect a unique and nuanced landscape relative to other intellectual property registrations. The data indicate 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

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218.   *See supra* Figure IV.
219.   Linda Carter, *The Global Impact and Implementation of Human Rights Norms: Introduction*, 25 GLOB. BUS. & DEV. L.J. 5, 19 (2012). This proposition assumes that there is not an offsetting overrepresentation of minorities in nonindividual applicants (for example, corporations), which based on our data, seems unlikely.
220.   *See supra* Figure VI.
221.   Naomi Ellemers & Floor Rink, *Diversity in Work Groups*, 11 CURRENT OP. PSYCH. 49, 50 (2016).
222.   Amit Bindra, *The Application of Antitrust Logic to Military Procurement Policies Would Enhance America's National Security*, 10 DEPAUL BUS. & COM. L.J. 405, 407 (2012).

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 race and gender disparities.