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THE EXTENDED PROTECTION OF "STRONG" TRADEMARKS*

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INTRODUCTION

Legal evolution evidences that trademarks are currently protected not only to avoid consumer confusion, but also to provide firms with an adequate return on investments made to create and maintain strong brands. However, the rational basis of this development is subject to question and review. While free riding on a famous brand may, indeed, generate negative spillover effects, such as trademark dilution, and this may, in turn, reduce the incentive to invest in trademarks, this Article seeks to illustrate that such investment cannot be seen as indicative of product quality. Indeed, this Article suggests that the existence of trademark protection does not, per se, create an incentive for continuous improvement in product quality. Not even the signalling argument—specifically, in relation to advertising and brand extensions—can, by itself, justify the extended protection of strong trademarks. In fact, the signalling argument may be invoked only when negative spillover effects are proven and are shown to adversely affect both the senior user of the trademark and the profitability of the trademark in all markets, thereby leading to a reduction of "welfare."

Part I of this Article begins by outlining the function of trademarks from a traditional law and economics perspective. The current evolution of trademark protection and the "new" lawyers' interpretation of trademark functions is addressed in Part II, including a discussion of the apparent conflict between this approach and the traditional view of economists. Part III summarizes the standard economic doctrine regarding trademark protection and argues that this doctrine does not completely address new questions raised, for example, by the existence of "strong" brands and their extensions. Accordingly, Parts IV and V briefly review the economic literature regarding advertising, brand extensions, and product quality. Ultimately, as outlined in Part VI, an extended protection of strong trademarks cannot be clearly explained by the desire to protect high product quality. However, assuming the possibility of trademark dilution caused by free riding on strong trademarks, it is evident that an extended protection can prevent welfare losses when product variety is considered as an important argument of the consumers' utility function. The Appendix at the conclusion of this Article includes additional analysis to illustrate that when free riding leads to an increase in the product classes covered by a famous trademark, then the senior user has an incentive to free ride on his or her trademark.

I. THE FUNCTION OF TRADEMARKS: A TRADITIONAL LAW AND ECONOMICS APPROACH

In the standard literature of law and economics, trademark law is presented as an incentive for business enterprises to invest in the quality of the goods and services with which marks are used and as a remedy to specific market failures.[1] Thus, it is argued that if it were impossible for consumers and for the public-at-large to identify the source of goods, then every business would have an incentive to supply goods at a quality lower than the average prevailing in the industry because the profits generated by the individual transaction would, in fact, be garnered by the individual business entering into it, while the reputational costs derived from the public's disappointment with the quality of goods would be externalized to the entire industry.[2] Accordingly, the adoption of a sign or symbol that consistently links the goods to a source over time is seen as a device to overcome this difficulty.[3]

In a similar vein, it is often noted that while the presence of a trademark lowers the search costs born by consumers, it also enables the public to repeat purchases that have proven satisfactory and to avoid future purchases of goods that have previously failed to do so.[4] Firms that offer a satisfactory price-quality combination are, thus, rewarded; in contrast, the ones that fail to do so must suffer the consequences.[5]

From this perspective, the case is often made that while other intellectual property rights—for example, patents and copyrights—provide a mix of static costs and dynamic benefits, in principle, very few costs and no deadweight losses whatsoever are associated with trademark protection.[6] This holds true, of course, provided that a few simple legal caveats are put in place.[7]

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1. *See, e.g.*, WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 167–68 (2003).

2. William M. Landes & Richard A. Posner, *Trademark Law: An Economic Perspective*, 30 J.L. & ECON. 265, 266–68 (1987).

3. Nicholas Economides, *Trademarks*, *in* THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 601, 601–03 (Peter Newman ed., 1998); *see also* George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488, 499–500 (1970).

4. *See, e.g.*, Frank I. Schechter, *The Rational Basis of Trademark Protection*, 40 HARV. L. REV. 813, 818 (1927) (noting that the "true functions of the trademark are, then, to identify a product as satisfactory and thereby to stimulate further purchases by the consuming public").

5. *See id.*

6. Landes & Posner, *supra* note 2, at 266–68.

7. As the authors indicate, while other intellectual property rights have a public good

Indeed, the legal system adopts the following: (1) rules against appropriating generic names as trademarks in order to avoid the monopolization of current language on behalf of one business to the detriment of others,[8] and (2) rules against the adoption of functional or aesthetic features as trademarks[9] in order to avoid that the same are appropriated by one specific firm to the exclusion of its competitors. Thus, it follows that trademark protection may well be perpetual—in other words, it may be for a limited time (usually ten years)[10] but subject to renewal at the holder's option[11]—considering that in a well-tuned legal system incorporating the rules under (1) and (2) above,[12] such protection does not affect the competitive structure of the market and is not likely to entail any deadweight loss.

It should be noted that until just a few decades ago, both common and civil law lawyers adopted an approach to explain the rationale for trademark protection that was markedly different from the one suggested by economists, but was altogether compatible with it. According to the standard lawyers' original understanding, the rationale for trademark protection resides in the trademark's function of designating the origin of the goods: the public should be protected against the risk of confusion as to the origin of the goods deriving from the unauthorized use of an identical or similar sign in connection with identical or similar goods. At this stage, lawyers tended, however, to add that this system did create an incentive to encourage firms to invest in the quality of the goods offered to the market; this, thereby, established a clear link to the economists' approach summarized above.[13] However, lawyers were reluctant to assert that the main purpose of trademark law is to guarantee the qualitative level of the goods on which the mark is affixed; they were afraid that this understanding might ultimately fetter the freedom of trademark holders to vary the characteristics of the goods. But they were ready to join their economist brethren in recognizing that the de facto outcome of the operation of trademark law is to keep the qualitative level of the goods on which the mark is affixed constant over time. Still, according to this

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character such that restricting their use has a cost, "a proper trademark is not a public good; it has social value only when used to designate a single brand." *Id.* at 274.

8. *See, e.g.*, 15 U.S.C. § 1064 (2000).

9. *See, e.g.*, *id.*

10. *See, e.g.*, *id.* § 1058.

11. *See, e.g.*, *id.*

12. *See supra* notes 8–9 and accompanying text.

13. *See supra* text accompanying notes 1–5.

early approach, protection against infringement could only be granted on the basis of a likelihood of consumer confusion as to the origin of the goods.[14]

II. The Legal Evolution and the New Protected Function of Trademarks

In the last sixty years, trademark laws have evolved considerably.[15] Since 1947, twenty-five state legislatures in the United States have granted trademark protection even in the absence of any likelihood of confusion as to the origin of the goods and services.[16] The work of Frank Schechter is generally considered to have provided the seminal contribution to the "trademark dilution" doctrine that was largely responsible for underpinning this legislative development.[17] According to the doctrine of trademark dilution, famous trademarks should be granted protection even in the absence of direct competition between the senior and the junior users and in the absence of a risk of confusion as to the origin of the marked goods.[18] Although Schechter did not explicitly refer to the term "dilution," he insisted that the "uniqueness of a mark" is the only rational basis of trademark protection.[19] In fact, even prior to Schechter's contribution, a few courts in the United States[20] and Germany[21] had already granted protection to famous trademarks in the absence of a risk of confusion as to the origin of the marked goods.

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14. *See* Jessica Litman, *Breakfast with Batman: The Public Interest in the Advertising Age*, 108 YALE L.J. 1717, 1720 (1999). Under the traditional approach, trademarks were considered "mere repositories of the goodwill that accumulated around the products that they distinguished." *Id.* Without the product the trademark served to differentiate, the trademark was considered to be completely valueless. *Id.*

15. For an illustrative overview of this evolution, see TONY MARTINO, TRADEMARK DILUTION (1996).

16. *Id.* at 1; *see also* H.R. REP. NO. 104-374, at 3 (1995) (highlighting that as of 1995—in the time leading up to the passage of the Federal Trademark Dilution Act—only approximately twenty-five states had legislatively enacted prohibitions against trademark dilution).

17. *See* Schechter, *supra* note 4, at 813.

18. *Id.* at 825–30.

19. *Id.* at 823, 831.

20. *See, e.g.*, Wall v. Rolls-Royce of Am., 4 F.2d 333 (3d Cir. 1925) (considering use of the ROLLS-ROYCE mark on radio tubes and recognizing that the mark would suffer as a result of this association).

21. *See, e.g.*, Landesgericht Elberfeld [LG] [District Court] Sept. 11, 1925, 25 Juristische Wochenschrift 502, XXV Markenschutz und Wettbewerb 264 (deciding a case regarding the use of the well-known ODOL mark for mouthwash and recognizing the importance of not permitting the value of the mark to be diminished by another's use of the mark).

In the last several decades, the trickle has become a flood. Since 1970, antidilution protection has been adopted by the Benelux countries,[22] and the 1988 Directive of the Council of the European Communities has been adopted by all Member States.[23] In this latter case, the antidilution feature was complemented by a prohibition against any form of free riding on the reputation of a senior mark.[24] Protection against both dilution and free riding is also granted by Council Regulation 40/94 on the Community Trade Mark.[25] In both provisions, free riding is considered a prohibited way of taking "unfair advantage of . . . the distinctive character or the repute" of the senior mark.[26] In 1994, antidilution prohibitions were, to some extent, generalized by the provisions of the international agreement binding all of the 147 Member States to the World Trade Organization (WTO) via Article 16 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs Agreement).[27] In particular, Article 16(3) states the following:

> Article 6*bis* of the Paris Convention (1967) shall apply, *mutatis mutandis*, to goods or services which are not similar to those in respect of which a trademark is registered, provided that use of that trademark in relation to those goods or services would indicate a connection between those goods or services and the owner of the registered trademark and provided that the

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22. *See* Benelux Convention on Trade Marks, Mar. 19, 1962, 704 U.N.T.S. 341, 351–52.

23. *See* Council Directive 89/104, 1989 O.J. (L 40) 1.

24. As a matter of fact, Directive 89/104 left open the option for Member States to decide whether to implement protection against dilution or not. Indeed, Article 5(2) states the following:

> Any Member State may also provide that the proprietor shall be entitled to prevent all third parties not having his consent from using in the course of trade any sign which is identical with, or similar to, the trade mark in relation to goods or services which are not similar to those for which the trade mark is registered, where the latter has a reputation in the Member State and where use of that sign without due cause takes unfair advantage of, or is detrimental to, the distinctive character or the repute of the trade mark.

Id. art. 5(2). Unsurprisingly, all Member States have taken advantage of the Directive's permissiveness in this regard.

25. Council Regulation 40/94, art. 9(1)(c), 1994 O.J. (L 11) 1.

26. *Id.*; Council Directive 89/104, *supra* note 23, art. 5(2).

27. Agreement on Trade-Related Aspects of Intellectual Property Rights art. 16, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex IC, Legal Instruments—Results of the Uruguay Round, 33 I.L.M. 1125, 1197 [hereinafter TRIPs Agreement].

interests of the owner of the registered trademark are likely to be damaged by such use.[28]

Finally, an antidilution rule was also adopted at the federal level in the United States: the Federal Trademark Dilution Act (FTDA).[29]   A decade later, the changes made to the trademark laws with the FTDA were fine-tuned with the adoption of the Trademark Dilution Revision Act (TDRA).[30]

The rationale behind the extension of protection to include principles of antidilution and prohibitions against free riding has been clear to both courts and commentators from the very beginning. When a trademark may be perceived as "strong" because it possesses a distinctive character or is "famous," then its value is endangered by unauthorized uses by a non-related third party; this is true even though consumers may not be misled. Rather than aim merely to protect against confusion as to the origin of goods, these extended protections are intended to avoid dilution of the promotional value of trademarks[31]

28*. Id.* art. 16(3). This provision is much less "protectionist" than the rules contained in European legislation resulting from the implementation of Directive 89/104.   Indeed, European law grants protection even in the absence of any actual damage for the senior mark. *See generally* GUSTAVO GHIDINI, PROFILI EVOLUTIVI DEL DIRITTO INDUSTRIALE (2001). It is, in fact, sufficient for the junior mark to take advantage of the reputation of the senior mark to fall under the provision and to be considered an infringer. It can similarly be observed that the legislation of Member States, as opposed to Article 16(3) of the TRIPs Agreement, grants a wider protection to well-known marks because it does not require "that use of that trademark in relation to those goods or services would indicate a connection between those goods or services and the owner of the registered trademark."   TRIPs Agreement, *supra* note 27, art. 16(3). Therefore, it can be argued that Article 16(3) of the TRIPs Agreement sticks to the traditional approach by requesting a form of likelihood of confusion, which has been expanded to a risk for the consumer to establish a "connection" between the two producers, as a condition for granting protection to the senior mark, whereas the legislation of Member States dispenses with this requirement. *See id.* However, according to the interpretation of the legislation by the European Court of Justice (ECJ), a finding of infringement requires, at a minimum, that the degree of similarity between the mark with a reputation and the junior sign has the effect that the relevant section of the public establishes a "link" between the junior sign and the senior mark. *See* Case C-408/01, Adidas-Salomon AG v. Fitnessworld Trading Ltd., 2003 E.C.R. I-12537. For further analysis of Article 16(3) of the TRIPs Agreement and Article 5(2) of Council Directive 89/104, see GUY TRITTON, INTELLECTUAL PROPERTY IN EUROPE 191–280 (2d ed. 2002).

29.   Federal Trademark Dilution Act of 1995, Pub. L. No. 104-98, 109 Stat. 985 (codified as amended at 15 U.S.C. §§ 1125, 1127 (2000)).

30.   Trademark Dilution Revision Act of 2006, Pub. L. No. 109-312, 120 Stat. 1730 (codified as amended in scattered sections of 15 U.S.C.); *see* Barton Beebe, *A Defense of the New Federal Antidilution Law*, 16 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1144, 1151–56 (2006).

31.   According to the U.S. approach, this can occur by "tarnishment" of the positive associations engendered by a trademark as well as by "blurring" its distinctiveness. Thus, for example, "Buttwiser" t-shirts have been considered as tarnishing the BUDWEISER mark for

and the misappropriation of the capital of publicity invested in trademarks.

As a result, protections are now afforded to trademarks where they formerly might not have been. The trademark ROLLS-ROYCE can now be protected, for example, in most jurisdictions against its use as a sign for a pub even if no consumer would be misled into believing that the trademark owner had branched off into pub franchises or that there is an association with or sponsorship of the pub by the luxury car manufacturer. For a finding of infringement, confusion as to the origin of goods is no longer required.[32] It is sufficient that consumers establish some sort of link between the junior sign and the senior one, and such a link may be established even if the goods are comparatively remote.[33]

Therefore, it is recognized that the traditional function of designating the origin of the goods is not the function that gets protected through antidilution laws. Instead, protection is afforded to the investment that the right holder has made in promotion—this is a value that has been stored in the sign or symbol.[34] Affording measures to protect investment in marks recognizes that "marks are cyphers around which investment in the promotion of a product is built and that investment is a value which deserves protection as such, even when there is no abuse arising from misrepresentations either about origin or quality."[35] It could be argued, at least in principle, that the greater the investment in advertising, the wider the protection that should be granted by law.

As indicated, lawyers did not fail to elaborate quite early on the underlying reason for such an extension of protection.[36] In fact, what they have been saying—particularly in the last two decades, but in some instances much earlier[37]—is that trademarks not only serve as indicators of origin, as was initially held under older trademark law regimes, but they also serve both as devices for storing investment in promotion and as proxies for quality levels. Most legal systems have now evolved to

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beer. *See* Anheuser-Busch Inc. v. Andy's Sportswear Inc., 40 U.S.P.Q.2d (BNA) 1542 (N.D. Cal. 1996). For a treatment of the issue of dilution by "blurring," see Mead Data Cent., Inc. v. Toyota Motor Sales, U.S.A., Inc., 875 F.2d 1026, 1031 (2d Cir. 1989).

32. 15 U.S.C. § 1125.

33. *See id.*

34. W.R. Cornish, Intellectual Property: Patents, Copyrights, Trade Marks and Allied Rights 612 (4th ed. 1999).

35. *Id.*

36. *See supra* Part I.

37. *See, e.g.*, Schechter, *supra* note 4, at 813; *see also* Von Hermann Isay, *Die Selbständigkeit des Rechts an der Marke*, 1929 GRUR 23.

ensure that protections extend to all of these functions.[38] Lawyers note that this development makes sense. After all, more and more consumer decisions are made as a result of the direct communication between firms and the public through advertising, rather than as a repetition of a prior successful purchasing experience.

For its part, economic literature specifically concerned with intellectual property protection has not undergone a corresponding evolution and still provides a rationale for trademark protection that fits the old legal regime rather than the new one. When it comes to explaining the rules against dilution and free riding, the explanations are either unsatisfactory or outright puzzling. William M. Landes and Richard A. Posner purport to explain trademark antidilution rules by underlining that even association without confusion may be damaging.[39] They believe that this principle is adequately demonstrated by the fact that few children have been named "Adolf" in the time since Hitler's evilness was exposed.[40] At the same time, they deny that the purpose of this feature may consist in internalizing the benefits of investment in a prestigious brand.[41] Even the pioneering contribution of "perception advertising," which was set forth by Nicholas Economides and defined as the bundling of a mental image and a physical commodity through a trademark,[42] is coupled with only the most cursory account of antidilution rules.[43]   On the other hand, a substantial number of economists have discussed in great detail and with remarkable insights both brand stretching and the rationale for the extension of brand protection; however, their insights are primarily concerned with the economics of advertising and have not extended to particularly addressing intellectual property issues and the shift in the rationale for trademark protection.[44]

Thus, even today trademarks still tend to be seen by mainstream law and economics literature as "incentives": they are viewed as self-

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38. *See* Litman, *supra* note 14, at 1721–25 (recounting the expansion of the laws of trademark protection).

39. LANDES & POSNER, *supra* note 1, at 207.

40. *Id.*

41. *See id.* at 206–09.

42. Economides, *supra* note 3, at 603.

43. *See id.*

44. *See, e.g.*, Claude Fluet & Paolo G. Garella, *Advertising and Prices as Signals of Quality in a Regime of Price Rivalry*, 20 INT'L J. INDUS. ORG. 907 (2002); Richard E. Kihlstrom & Michael H. Riordan, *Advertising as a Signal*, 92 J. POL. ECON. 427 (1984); Paul Milgrom & John Roberts, *Price and Advertising Signals of Product Quality*, 94 J. POL. ECON. 796 (1986); Phillip Nelson, *Advertising as Information*, 82 J. POL. ECON. 729 (1974).

enforcing mechanisms that serve to ensure that consumers are provided with a satisfactory quality of the goods bearing the brand mark.[45] Here, it is submitted that this view is outdated and certainly deserves a closer look.

III. TRADEMARK PROTECTION AND PRODUCT QUALITY

Economists generally agree on the fact that trademark protection creates an incentive for the production of quality goods.[46] However, this function is presented by economists in two different versions. Some authors claim that trademark protection induces firms to offer goods with a precisely defined and constant quality.[47] For others, trademark protection makes firms produce high quality goods, and the aggregate effect is to increase the average quality of goods throughout the whole market.[48]

The adoption of the latter approach may be crucial to providing a rationale for the extended protection of "strong" and famous trademarks. Take, for instance, the primary finding of Landes and Posner: the higher the quality of products, the greater the incentive to invest in order to create a "strong" trademark.[49] Although Landes and Posner put forth a seminal contribution in the economic literature on trademarks, their findings are affected by several limitations as related to the aims of our research. First, Landes and Posner tacitly assume that the activities that create a "strong" trademark, such as the production of high quality products and advertising, are perfect signals to consumers regarding the characteristics of products.[50] Second, their model mainly concerns firms that are attempting to build a "strong" trademark;[51] what really is at stake in real markets, though, is the extended protection of brands that are *already* "strong." And third, their model deals with the use of trademarks within a product class; the possibility of non-homogeneous goods is included, but the phenomenon

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45. Landes & Posner, *supra* note 2, at 270.

46*. Id.* at 269 ("[T]rademark protection encourages expenditures on quality.").

47. Economides, *supra* note 3, at 602; *see also* Akerlof, *supra* note 3, at 499–500.

48*. See, e.g.*, Benjamin Klein & Keith B. Leffler, *The Role of Market Forces in Assuring Contractual Performance*, 89 J. POL. ECON. 615 (1981); Landes & Posner, *supra* note 2; Carl Shapiro, *Consumer Information, Product Quality, and Seller Reputation*, 13 BELL J. ECON. 20 (1982).

49. Landes & Posner, *supra* note 2, at 269–70.

50*. Id.*

51*. Id.*

of brand extension is not considered.[52]   This same limitation characterizes the work of others as well.[53]

The first issue will be discussed in Part IV,[54] while the second and third issues will be addressed in Part V.[55] Here, however, we intend to clarify the general relationship between the legal protection of private trademarks and product quality.

Trademark protection does, indeed, supply an incentive for firms to maintain a constant product quality, but it does not necessarily create incentives to offer high quality products. The latter depends on the general strategies of product differentiation, which are, in turn, linked to market structure, the type of goods and services, and the nature of competition prevailing in the market with respect to price, quantity, variety, and quality. This point may be illustrated by means of a well-known example: the principle of (maximum) product differentiation.[56] The principle of product differentiation represents one of the most important theoretical contributions provided by the literature on industrial organization.[57]

Jean Tirole outlines the principle of product differentiation by presenting an illustration wherein there are two firms:[58] consider a market where two profit-maximizing firms simultaneously compete by choosing the quality and then the price of a product. Thus, the "game" is in two stages and firms have perfect information about the characteristics of the market.[59] It can be shown that, in equilibrium, one firm offers a product with the highest available quality while the other chooses the lowest quality level, given constant costs of quality. The prices will differ substantially as well. The economic intuition for this equilibrium is that firms maximally differentiate product quality in order to "relax" price competition, which would drive profits down if the two products were similar.[60] High product differentiation, thus,

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52. *Id.*

53. *See, e.g.*, Richard S. Higgins & Paul H. Rubin, *Counterfeit Goods*, 29 J.L. & ECON. 211 (1986); J.A.K. Huntley & Frank H. Stephen, *Unfair Competition, Consumer Deception, and Brand Copying: An Economic Perspective*, 15 INT'L REV. L. & ECON. 443 (1995); W.J. Lane, *Compulsory Trademark Licensing*, 54 S. ECON. J. 643(1988).

54. *See infra* Part IV.

55. *See infra* Part V.

56. JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 281–82, 306 (1988).

57. *Id.*

58. *Id.* at 281.

59. *Id.*

60. *Id.* Tirole notes that "[e]ach firm locates far from its rival in order not to trigger a low price from the rival, and thus price competition is softened." *Id.*

enables firms to identify their own market segment.[61] The result of maximum quality differentiation is an extreme case, and its occurrence depends on the assumptions of the model, including such variables as the number of firms, the structure of the game, and costs of quality, among others. Although many authors have shown that, if these are modified, the maximum differentiation principle does not hold, the basic intuition still holds: when there is quality competition, there is not an upward race for the production of high quality products.[62]

The strategies of product differentiation assume that consumers can distinguish between the various products; therefore, the model is tacitly based on the assumption of the existence of trademarks, as is the case in all oligopoly theories.[63]   Accordingly, the existence of trademark protection does not necessarily imply the production of high quality products. In other words, it is difficult to claim that there exists a direct and positive correlation between trademark protection and high quality products, while there is a general consensus that trademark protection induces firms to maintain the quality of their goods and services constantly. However, the relationship between trademark protection and high quality could still be indirect. This possibility is considered next.

IV. TRADEMARK PROTECTION, PRODUCT QUALITY, AND ADVERTISING

All investments devoted to achieving market success necessarily assume the current or future existence of a trademark, which links a particular product to a firm or to another umbrella brand. This holds both when market success relies on research and development, and when it depends on advertising and promotion.[64]   For the sake of

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61. *Id.* The principle of maximum differentiation was originally obtained in a context of horizontal product differentiation—that is, when the strategic variable of firms is variety and not quality. The debate on product differentiation strategy began in the late seventies, when rigorous applications of game theory permitted a reexamination of the original Hotelling model. *See* Harold Hotelling, *Stability in Competition*, 39 ECON. J. 41 (1929).

62. TIROLE, *supra* note 56, at 282.

63*. Id.* at 281–82.

64. In the case of industries where market success is mainly determined by research and development, trademark issues are partially ignored due to the importance of other forms of intellectual property protection, such as patents. Trademark protection is, however, fundamental to market patented products. For example, in the pharmaceutical industry the amount of marketing expenses is often equal to those in research and development. In addition, a patent represents a leverage to create a strong brand: during the years of patent protection, a product is associated with a trademark, and this association will affect consumer behavior even after the patent has expired.

simplicity, let us exclude the case of market success caused by research and development and consequent patent protection. Suppose that firms focus on marketing and advertising investments in order to create particularly "strong" brands.[65] This strength may be generated by brand loyalty or a reputation for high quality, among other things. Therefore, the protection of these trademarks tacitly implies the protection of an adequate return on investment.

In fact, if other firms were allowed to use "strong" trademarks—adopting a free riding strategy—then no firms would have an interest in carrying out any kind of investment. From this point of view, trademarks appear to be very similar to patents. Is there a justification either in terms of efficiency or a guarantee of high quality of imposing such a particular rationale for trademark protection? Of course, all trademarks should be protected against infringement even if the owner is small and never advertised. But should protection be increased when firms carry out intense advertising campaigns? This question is important empirically because trademark protection is potentially infinite in time, and the issue should specifically be addressed now because, as indicated in Part II, antidilution rules have been adopted in most jurisdictions in recent years.[66]

The rationale for a greater protection of "strong" and famous trademarks may be formulated as follows. Firms that possess "strong" trademarks are in this situation because of huge investments in advertising.[67] Since intense advertising is to be expected by firms offering high quality products, a larger trademark protection for these firms is needed to ensure a high average quality, which, if everything else remains the same, enhances social welfare. This argument relies, however, on the assumption of a positive correlation between advertising expenses and product quality. There is an abundance of theoretical literature analyzing the relationship between advertising and product quality.[68] The relationship is subtle, and it varies depending on the circumstances.

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65. Hereafter, the investment aimed at maintaining a strong brand will be represented by advertising outlays. Advertising is not the only promotional expense incurred by a firm to create and maintain strong trademarks, but it is significant given its visibility for consumers. The general interpretation of advertising outlays in the models that will be presented is expenses incurred to affect the demand.

66. *See supra* Part II.

67. *See generally* Litman, *supra* note 14, at 1725–28.

68. *See, e.g.*, Mark W. Nichols, *Advertising and Quality in the U.S. Market for Automobiles*, 64 S. ECON. J. 922, 923–26 (1998); Richard Schmalensee, *A Model of Advertising and Product Quality*, 86 J. POL. ECON. 485 (1978).

Phillip Nelson's pioneering theory explains conspicuous advertising outlays as a means by which producers signal the quality of their products to imperfectly informed consumers and suggests a positive correlation between quality and advertising expenditures.[69] The explanation provided in this Article excludes markets where purchases are either one-shot or very infrequent with respect to changes in the characteristics of the products, and it focuses on experience with quality goods with less reliance on word-of-mouth than what Nelson classified as search goods.[70] The main idea is that only a high quality firm would find it profitable to spend large sums of money on advertising.[71] Indeed, only a high quality firm could generate enough repeat purchases to recover the advertising costs.[72] Following Nelson, several authors have since developed formal models with and without repeat purchases.[73]

Richard E. Kihlstrom and Michael H. Riordan consider advertising signals in the context of a perfectly competitive industry with free entry where firms are price-takers.[74] They find that a positive correlation between advertising and quality can also arise when the interaction among firms and consumers is not repeated, but only if variable unit costs decrease with quality.[75] In the analysis of Paul Milgrom and John Roberts, pricing and advertising combine to signal quality.[76] Although a high price could independently serve as a signal of a correspondingly high quality; pricing also impacts demand.[77] Despite indicating high quality, too high of a cost will reduce demand.[78] Monopolists, therefore, must strike a balance in order to generate an adequate demand among consumers by communicating quality to consumers through pricing and advertising.[79] The model defined by Milgrom and Roberts "relies on repeat purchases and therefore is better suited to explain the marketing strategies of non-durable experience goods rather than durable

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69. Nelson, *supra* note 44, at 730.

70. *See id.* at 730, 735.

71. *See id.* at 735–43.

72. *See id.*

73. Richard Schmalensee first challenged Nelson's views, and he developed a model in which advertising is, in fact, correlated with low quality due to consumers' bounded rationality. *See* Schmalensee, *supra* note 68, at 493–98.

74. Kihlstrom & Riordan, *supra* note 44, at 427.

75. *Id.* at 448–50.

76. Milgrom & Roberts, *supra* note 44, at 799.

77. *Id.*

78. *Id.*

79. *Id.* at 802–14; *see* Laurent Linnemer, *Price and Advertising as Signals of Quality When Some Consumers Are Informed*, 20 INT'L J. INDUS. ORG. 931, 932 (2002).

experience goods."[80]   Unlike, Nelson's analysis,[81] the articles by
Kihlstrom and Riordan as well as Milgrom and Roberts[82] treat
advertising as a "purely dissipative expense."[83]   Laurent Linnemer
explains that "[t]his allows a clear separation between Nelson's signal of
quality argument and the other roles eventually played by advertising."[84]
Others have sought to challenge Nelson's analysis as well. The model
proposed by Ignatius J. Horstmann and Glenn M. MacDonald points
out the shortcomings of "consumption" as an indicator of product
quality;[85] these authors find fault with Nelson's analysis to the extent
that it presumes that consumers are fully informed regarding all relevant
information about product quality as a result of some prior purchase.[86]
Accordingly, Horstmann and MacDonald emphasize in their findings
that the predictions of signalling models depend on considerable
variables of consumer learning.[87]

Some authors have more recently reexamined the issues regarding
the relationship between advertising, quality, and price.[88] For instance,
according to Claude Fluet and Paolo G. Garella, price rivalry is
essential.[89]   Fluet and Garella show that advertising is an essential
element of the signalling mix in a regime of price rivalry with small
quality differentials.[90]   Linnemer emphasizes that the presence of a
proportion of informed consumers makes advertising a useful signal
even in the absence of repeat purchases.[91] Therefore, the analysis of

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80. Linnemer, *supra* note 79, at 933.

81. Nelson, *supra* note 44, at 735–47.

82. *See* Kihlstrom & Riordan, *supra* note 44, at 430–46; Milgrom & Roberts, *supra* note 44, at 802–14.

83. Linnemer notes that the characterization of advertising in the two articles is as a "purely dissipative expense (like burning money)." Linnemer, *supra* note 79, at 932.

84. *Id.*

85. Ignatius J. Horstmann & Glenn M. MacDonald, *When Is Advertising a Signal of Product Quality?*, 3 J. ECON. & MGMT. STRATEGY 561, 563, 565–67 (1994).

86. *Id.*; *see* Nelson, *supra* note 44, at 735–47.

87. Horstmann & MacDonald, *supra* note 85, at 565–67.

88. Other theoretical studies adopt a slightly different approach. Kyle Bagwell and Michael H. Riordan analyze the role of high introductory prices. Kyle Bagwell & Michael H. Riordan, *High Declining Prices Signal Product Quality*, 81 AM. ECON. REV. 224 (1991). Laurent Linnemer investigates the question of entry. Laurent Linnemer, *Entry Deterrence, Product Quality: Price and Advertising as Signals*, 7 J. ECON. & MGMT. STRATEGY 615 (1998). Bill Z. Yang treats a duopoly with the Cournot competition model and, therefore, does not consider price signals. Bill Z. Yang, *Simultaneous Advertising as a Signal of Product Quality*, 33 AUSTL. ECON. PAPERS 186 (1994).

89. Fluet & Garella, *supra* note 44, at 908–09.

90. *Id.* at 914–21, 923.

91. Linnemer, *supra* note 79, at 933.

Nelson as well as Milgrom and Roberts is extended from nondurable goods—or more precisely, from goods that generate repeat purchases—to durable goods, which are goods that do not generate repeat purchases.[92] The signalling argument, however, relies on a different explanation.[93]

Broadly speaking, advertising has been shown to be neither necessary to signal quality nor cheaper than alternative signals such as high prices. Signalling explanations of advertising, therefore, appear weaker than originally argued by the proponents[94] who sought to reply to criticisms against the social waste associated with advertising.

There have also been some empirical analyses of the signalling hypothesis, but the results of these studies are rather inconclusive.[95] The findings provide, at best, weak support for the signalling hypothesis: some positive and significant correlations among quality, advertising, and price exist in a cross section of products or models of a product within an industry.[96] In many instances, there seems to be no correlation at all among these variables, not even a negative correlation. As Kyle Bagwell sums up, the "main empirical implication is that no systematic correlation between advertising and quality is to be expected, since the relationship reflects market circumstances and the simultaneous use of price and advertising as signals of quality."[97]

In conclusion, the quality-signalling argument cannot be invoked to extend the protection of "strong" trademarks: the claim cannot be made that goods and services that are linked to famous brands created

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92. *Id.* at 932–33; *see* Milgrom & Roberts, *supra* note 44, at 796; Nelson, *supra* note 44, at 729.

93. Linnemer, *supra* note 79, at 933.

94. *See, e.g.*, Nelson, *supra* note 44, at 751.

95. *See, e.g.*, Robert B. Archibald et al., *Quality, Price, Advertising, and Published Quality Ratings*, 9 J. CONSUMER RES. 347, 350–51 (1983); Richard E. Caves & David P. Greene, *Brands' Quality Levels, Prices, and Advertising Outlays: Empirical Evidence on Signals and Information Costs*, 14 INT'L J. INDUS. ORG. 29, 44–49 (1996); Ignatius Horstmann & Glenn MacDonald, *Is Advertising a Signal of Product Quality? Evidence from the Compact Disc Player Market, 1983–1992*, 21 INT'L J. INDUS. ORG. 317, 326–30 (2003); Nichols, *supra* note 68, at 928–35; Louis Thomas et al., *An Empirical Examination of Advertising as a Signal of Product Quality*, 37 J. ECON. BEHAV. & ORG. 415, 421–24 (1998); *see also* Sridhar Moorthy & Hao Zhao, *Advertising and Quality: An Empirical Analysis* (Simon Sch., Univ. of Rochester, Research Paper Series, Working Paper No. MS 95-04, 1996).

96. *See* sources cited *supra* note 95.

97. Kyle Bagwell, *The Economic Analysis of Advertising* 104 (Columbia Univ., Dep't of Econ. Discussion Paper Series, Paper No. 0506-01, 2005), *available at* http://www.columbia.edu/cu/economics/discpapr/DP0506-01.pdf.

by means of large advertising outlays are systematically characterized by high quality.

V. BRAND EXTENSIONS AND PRODUCT QUALITY

The relationship between trademark protection and product quality can also be analyzed by taking into account the economic literature on extensions. Brand extension is a phenomenon that consists of extending an established brand name, which is identified with a product in one market, to a new product in another market—this is also known as brand stretching.[98] Well-known examples of brand extensions include the following: (1) the VIRGIN mark,[99] which has been extended to beverages, music products, air and railway services, and financial products,[100] and (2) the BIC mark,[101] which is applied to pens, lighters, shavers, kayaks, and windsurfs.[102] It goes without saying that, like advertising, brand extensions presuppose trademark protection: when a firm wants to extend a brand into a new market, it is expected to register the corresponding trademark in the related product class(es). Brand extension is often a means to save advertising costs, and the two practices may be considered as substitutes.[103] In addition, brand extensions are adopted by those firms that possess "strong" trademarks thanks to high marketing and advertising expenditures. For these reasons, the issues concerning trademark protection, product quality, advertising expenditures, and branding strategies are interrelated.

The issue of brand extensions leads to the central topic of this Article: the rationale for extended protection of "strong" trademarks. Brand extension is primarily implemented by granting protection to a trademark even in those comparatively remote product classes where the "strong" mark is not registered; to the extent that consumers may establish a link with the senior trademark, there is a defense for the "potential" brand extension of the same.

Some authors have investigated the rationale behind a brand extension strategy.   Luís M.B. Cabral, Jay Pil Choi, and Birger

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98. Lynne M. Pepall & Daniel J. Richards, *The Simple Economics of Brand Stretching*, 75 J. BUS. 535, 535 (2002).

99. Virgin Products, http://www.virgin.com/Products.aspx (last visited Apr. 20, 2007).

100*. Id.*

101. BIC Corporate: Our Brands, http://www.bicworld.com/inter_en/corporate/brands/brand_bic.asp (last visited Apr. 20, 2007).

102*. Id.*

103. Daniel C. Smith & C. Whan Park, *The Effects of Brand Extensions on Market Share and Advertising Efficiency*, 29 J. MARKETING RES. 296, 297 (1992).

Wernerfelt stress that extensions are primarily linked to a firm's attempt to build or maintain a certain reputation for quality of a product.[104] Choi demonstrates that brand extension helps a multiproduct monopolist to introduce a new experience good with less price distortion.[105] Cabral shows that for a given level of past performance, which gives rise to a certain reputation, firms stretch their brands if, and only if, product quality is sufficiently high.[106]

With a slightly different approach, Lynne M. Pepall and Daniel J. Richards study the relationship between brand extension and market structure.[107] For these authors, neither scope economies nor brand identity as signals of quality fit particularly well with explanations of the various types of brand stretching evidenced by real markets.[108] By using the concepts of brand recognition, Pepall and Richards show that it is possible to comprehend the purpose of particularly "strange" extensions—that is, those taking place between markets that are completely distinct in terms of both technology and market demand.[109]

In general, these models highlight that brand extensions may be used to signal high product quality, but other variables are at work as well. Consider, for instance, private labels, which are the most common form of brand extension. The quality positioning of private labels perceived by consumers is often lower with respect to branded goods. Hence, a private label may signal a particular level of quality, but not necessarily a high quality. The quality signalling through a brand extension seems to depend on the nature of goods, as in the case of advertising. In fact, most theoretical models of brand extension deal with experience goods, and the results only relate to these kinds of goods. We could add that in order for a signal of quality to be effective, brand extensions should assume repeat purchases. Hence, a direct and positive correlation between brand extension and product quality is not an outcome that may be generalized. In conclusion, legal institutions cannot rely on this correlation to justify a particularly high protection of "strong" brands

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104. Luís M.B. Cabral, *Stretching Firm and Brand Reputation*, 31 RAND J. ECON. 658 (2000); Jay Pil Choi, *Brand Extension as Informational Leverage*, 65 REV. ECON. STUD. 655 (1998); Birger Wernerfelt, *Umbrella Branding as a Signal of New Product Quality: An Example of Signalling by Posting a Bond*, 19 RAND J. ECON. 458 (1988).

105. Choi, *supra* note 104, at 661–664.

106. Cabral, *supra* note 104, at 664.

107. Pepall & Richards, *supra* note 98, at 535.

108. *See id.*

109. *See id.* at 536.

and trademarks that might be extended by forbidding unauthorized brand extensions by firms that want to free ride on a famous brand.

VI. FREE RIDING AND TRADEMARK DILUTION

The partial results that we have obtained so far do not take into account the negative spillover effects that may derive from a free riding strategy on a famous trademark. In reality, the defense of the extended protection of "strong" trademarks may be to a great extent based on the likelihood that free riding practices dilute the promotional value of a trademark.

Trademark dilution is an elusive concept. Trademark dilution laws existed in twenty-five states before the passage of the federal statute,[110] but courts were often hesitant to use them because dilution was perceived to be a somewhat nebulous concept and particularly difficult to prove.[111] The 2006 amendments enacted by the TDRA struck the prior definition of "dilution" from the federal statute,[112] but the FTDA, as it was then codified at section 45 of the Lanham Act, had defined dilution as "the lessening of the capacity of a famous mark to identify and distinguish goods or services, regardless of the presence or absence of (1) competition between the owner of the famous mark and other parties, or (2) likelihood of confusion, mistake or deception."[113] It is clear, though, that this definition did not establish a precise method to ascertain and measure trademark dilution.[114] In fact, many authors continue to provide different interpretations of the concept, especially when it is to be applied to real cases.[115]

For the sake of simplicity, we assume that free riding is likely to cause dilution and that this, in turn, determines a reduction of the ability of a trademark to generate revenues in all the markets where the brand is associated with a product or service. This permits an analysis of the welfare effects caused by free riding. Here, a graphical example is used

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110.   *See* H.R. REP. NO. 104-374, at 3 (1995).

111.   *Id.* at 3–4 (noting that "court decisions have been inconsistent and some courts are reluctant to grant nationwide injuctions for violation of state law where half of the states have no dilution law").

112.   Trademark Dilution Revision Act of 2006, Pub. L. No. 109-312, 120 Stat. 1730 (codified as amended in scattered sections of 15 U.S.C.).

113.   Federal Trademark Dilution Act of 1995, Pub. L. No. 104-98, 109 Stat. 985 (codified as amended at 15 U.S.C. §§ 1125, 1127 (2000)).

114.   *See id.*

115.   *See, e.g.*, Jerre B. Swann, *Dilution Redefined for the Year 2000*, 37 HOUS. L. REV. 729 (2000).

to examine these effects, but the Appendix provides more general proof of the results.[116]

Suppose that firm *A* has built a "strong" and famous brand, thanks to high advertising expenditures and quality products. Let us call it brand *T*. Firm *A* has the opportunity to use *T* in distinct markets.[117] Firm *A* will use *T* until the marginal revenue of a brand extension is higher than its marginal cost. This situation is illustrated in Figure 1.

Figure 1
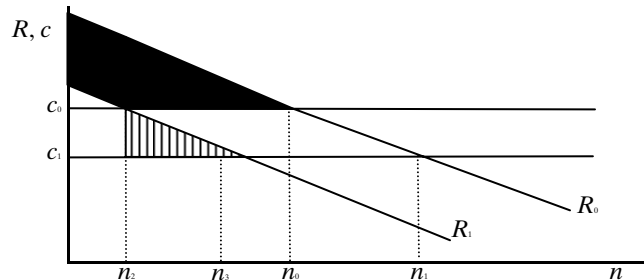
On the x-axis we have the product classes *(n)* where *T* can be extended; these are ordered according to the ability of the extension to generate revenues. The profitability of extensions is assumed to be invariant with respect to the identity of the user of trademark *T*. On the y-axis there are the costs and revenues of firms. For the sake of simplicity, all variables are assumed to be continuous.

The function R_0 is the marginal revenue of the brand extension in the product class *n*. Here, we assume that R_0 mainly depends on the advertising and marketing outlays aimed at promoting a good quality product. The profitability of an extension is naturally affected by the structure and the nature of competition in each market. However, this is not essential to obtain our qualitative results.

In Figure 1, c_0 is the marginal cost of extension for firm *A*, which we assume to be constant. This is because firm *A* offers goods with a high and constant quality in order to maintain a reputation for having a "strong" brand. In addition, from a promotional point of view, brand extension only implies that a certain product is related to *T* in a

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116. *See infra* Appendix.

117. For the sake of simplicity, assume that the product classes where trademarks are registered correspond to real markets.

particular market, and this does not make the marginal cost increase with the number of extensions.

Hence, firm A will extend T in n_0 product classes. Now suppose that there are other firms interested in using T. Moreover, suppose that these firms offer low quality products and that they do not incur advertising costs in order to keep trademark reputations high (these costs are incurred by the senior user A). These firms will then have lower costs (c_1) if they use T, and they will be attracted by the revenues described by R_0. In particular, they will find it profitable to use T until n_1.

An extended protection of trademark T can be justified as follows. If it were possible to use T in those product classes to the right of n_0—that is, if trademark protection were applied only to product classes where A actually offers goods and services, other firms would start to use T. This would make R_0 shift to R_1: the use of T would be, in general, less profitable because, for instance, inappropriate associations would dilute the trademark value.[118] Note that, as indicated earlier, we do not assume consumer confusion as to the origin of goods, but even without confusion, bad associations are likely to generate trademark dilution.

As a result, T will be used in only n_3 product classes (firm A will use it in n_2 and other firms in n_3-n_2 product classes), and the total number of classes covered by T will decrease ($n_3 < n_0$). Moreover, the erosion of trademark value will reduce total profits.[119] In other words, both producers and consumers will be worse off by a limited protection of T. Here, we do not analyze the effects of trademark extension in terms of price and quantity. However, we assume that, in each market, fewer products decrease consumer welfare, given consumers' love of (perceived) variety. To avoid this outcome, the protection of T should

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118. Another cause of trademark dilution is the market failure of a brand extension. Unsuccessful products, for example, may produce negative spillover effects on other goods with the same trademark. Gregg Jarrell & Sam Peltzman, *The Impact of Product Recalls on the Wealth of Sellers*, 93 J. POL. ECON. 512, 514–15, 533 (1985); Mark L. Mitchell, *The Impact of External Parties on Brand-Name Capital: The 1982 Tylenol Poisonings and Subsequent Cases*, *in* RISK, MEDIA AND STIGMA: UNDERSTANDING PUBLIC CHALLENGES TO MODERN SCIENCE AND TECHNOLOGY 203, 204, 211–12 (James Flynn et al. eds., 2001); Mary Sullivan, *Measuring Image Spillovers in Umbrella-Branded Products*, 63 J. BUS. 309, 327–29 (1990). Some authors affirm that "[t]rademark dilution shares some similarities with brand name dilution but differs from it as well." Maureen Morrin & Jacob Jacoby, *Trademark Dilution: Empirical Measures for an Elusive Concept*, 19 J. PUB. POL'Y & MARKETING 265, 266 (2000). In our theoretical framework, we assume that they define the same phenomenon.

119. Note that the decrease in A's profit (represented in the solid area) is greater than the other firms' additional profits (represented by the striped area).

be extended beyond n_0—that is, over product classes where A does not currently offer any goods or services.

One could argue that those firms that use T do not necessarily offer low quality goods. There might be firms producing good quality products, but despite this, such firms would not incur high advertising costs while, in contrast, firm A does. There would still be room for the use of a "strong" trademark with no spillover effect. However, lower quality firms have a greater incentive to use T because the expected profits are higher. Therefore, if trademark protection were limited to n_0, low quality firms would probably be the first to exploit the opportunity of using a "strong" brand.

Naturally, welfare changes depend on the magnitude of each effect. In Figure 2,[120] the use of T by other firms (in n_3-n_2 product classes) leads to an increase of both total classes where T is used ($n_3 > n_0$) and aggregate profits. Note, however, that in order to obtain such an outcome we need to assume a great cost differential between the senior user A and other firms (c_0-c_1, due, for example, to high quality differentiation) and a low spillover effect (R_0-R_1). Since a large cost differentiation is theoretically and empirically associated with strong spillover effects, the situation described in Figure 2 seems unlikely.

In addition, suppose that Figure 2 describes the real marginal cost and revenue functions faced by the senior user and the free riders—that is, assume a great cost differential and a modest dilution effect. In this situation, the senior user would find it profitable to free ride on his or her own trademark in order to increase profits. For example, if the senior user decided to cut the advertising investments and incur the marginal cost (c_1), the marginal revenue would shift from R_0 to R_1, and he or she would use T in n_3 product classes. In the new equilibrium, the total profits of the senior user would increase. If the senior user is a rational agent, when he or she does not extend his or her trademark until n_3, then Figure 2 does not adequately represent reality. Therefore, it is highly unlikely that free riding on a famous trademark increases profits in product classes where the trademark is used. This argument will be formalized and generalized in the Appendix.[121]

In summary, the use of a famous brand in those markets where it is not legally protected may cause a large trademark dilution, and this may reduce the profitability of the trademark to all potential users—that is, both the senior user and the free riders. The overall effect is the

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120. Note that symbols have the same meaning in Figure 2 as those defined in Figure 1.
121. *See infra* Appendix.

reduction of social welfare in terms of product variety and aggregate profits. In addition, when trademark dilution is negligible, it is unlikely that free riding implies an increase of the markets where the famous trademark is used.

Figure 2
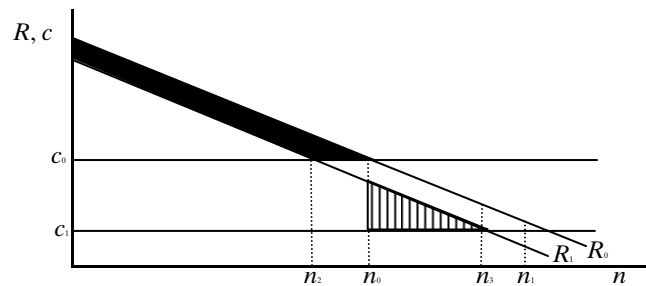
CONCLUSION

Statutory evolution and recent cases show that the protection afforded to "strong" trademarks is increasing.[122] Even in the absence of any likelihood of confusion as to the origin of products, the protection of a trademark aimed at providing its owner with a return for promotional and advertising investment is clear.

The broad development in the law governing the protection of "strong" trademarks calls for a reformulation of conventional economic analysis. Because it is widely believed that the rationale for intellectual property protection should not consist in the remuneration of private investment as such, one should look for an efficiency rationale or for explanations based on other criteria to justify such an evolution in trademark protection.

A "strong" and famous brand may give unrelated firms incentives to choose a free riding strategy to exploit the full potential of the brand: a small producer of skis might, for example, be interested in using the FERRARI brand for the launch of a new product line. Free riding may, in turn, generate negative spillover effects and reduce the average quality in the market because famous trademarks are usually associated with high quality products. What is the economic logic behind this argument?

We have shown that the existence of trademark protection does not create an incentive to continuous improvement in product quality, but

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122. *See supra* Part II.

rather to maintain the quality of offered goods and services. We have also conjectured that an extended protection of "strong" trademarks, which derive their strength from high promotional expenses, may be explained by using a quality-signalling argument: the more a firm invests in promotion, the higher the quality of its products and, thus, the higher the protection afforded to its trademarks should be in order to maintain the incentive to invest in high quality. Unfortunately, both the theoretical and empirical studies about the relationship between advertising promotion outlays and product quality are far from conclusive.[123] Also, brand extension strategies do not present a clear link to quality products.[124] Therefore, the extended protection of "strong" trademarks that might be stretched cannot be primarily based on quality arguments; the economic logic of the extended protection needs a different theoretical background.

Looking for an alternative explanation, we have analyzed the relationship between free riding behavior, trademark dilution, and welfare changes. Under certain conditions, we have shown that an extended protection of "strong" trademarks may find a more satisfactory theoretical explanation. When a brand is particularly valuable, some firms could use it in markets where the senior user does not operate—where, according to early trademark law, the corresponding trademark would not be protected. Given the lower costs incurred by those firms, the use of the trademark may earn them positive profits. However, the higher the profitability of the trademark and the higher the cost differentials due, for example, to quality differentials, the higher the negative spillover effects will probably be— in other words, trademark dilution. Since spillover effects impact the senior user and also the profitability of the trademark in all markets, the absence of an extended protection of "strong" trademarks may lead to a reduction in welfare, although measuring the latter is particularly difficult in this context because it should be estimated in a number of separate markets. In conclusion, when spillover effects are possible, it seems to be rational to protect a "strong" and famous trademark even in those markets where it is not actually used or registered; this tacitly guarantees any potential, future brand extensions by the senior user.

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123. *See, e.g.*, Kihlstrom & Riordan, *supra* note 44; Milgrom & Roberts, *supra* note 44; Nelson, *supra* note 44.

124. *See, e.g.*, Cabral, *supra* note 104; Choi, *supra* note 104; Smith & Park, *supra* note 103; Wernerfelt, *supra* note 104.

This result is far from conclusive because the magnitude of welfare effects may change from market to market. An empirical analysis of trademark dilution, which identifies the markets where the likelihood of dilution is higher, could help the research on these themes and provide empirical support for the application of trademark law. At the moment, the analysis that we have put forth may be helpful in clarifying the logic that underpins current trends in trademark protection.

APPENDIX

Assume that the marginal revenue of the trademark is given by $f(n)$, where n represents the product classes where the trademark may be used. In addition, assume that $f(n)$ is continuous and decreasing. The spillover effects of a free riding strategy make $f(n)$ shift downward to $g(n)=f(n)-\alpha$, with $\alpha>0$. The marginal cost is constant, and it is given by $k>0$ for the senior user and $c>0$ for the free riders, with $k>c$. Denote n_0: $f(n_0)=k$ and n_1: $g(n_1)=c$. We want to show that when free riding leads to an increase in the product classes covered by the famous trademark,[125] then the senior user would have the incentive to free ride on his or her trademark. That is, we want to show that

$$\int_0^{n_1} g(n)dn - cn_1 > \int_0^{n_0} f(n)dn - kn_0 \tag{1}$$

when

$$n_1 > n_0. \tag{2}$$

First, note that when

$$\int_0^{n_0} [f(n) - \alpha]dn - cn_0 > \int_0^{n_0} f(n)dn - kn_0 \tag{3}$$

we have, by integrating, rearranging, and considering that $g(n)=f(n)-\alpha$, that

$$\alpha < k - c. \tag{4}$$

When condition (4) is verified, we have $n_1>n_0$. In fact, $f(n_0)=k$, and $g(n_1)=f(n_1)-\alpha=c$. Therefore, with $\alpha<k-c$ or $k>c+\alpha$, $f(n_0)>f(n_1)$. Since $f(n)$ is decreasing, we have that $n_1>n_0$. This means that when the trademark dilution (α) is lower than the cost differential $(k-c)$, the total

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125. *See supra* Figure 2.

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number of classes covered by the famous trademark are higher when a free riding strategy is allowed.

When $n_1 > n_0$, we have

$$\int_0^{n_1} g(n)\,dn - cn_1 \; > \; \int_0^{n_0} g(n)\,dn - cn_0 \qquad (5)$$

or

$$\int_{n_0}^{n_1} g(n)\,dn > c(n_1 - n_0) \qquad (6)$$

because $g(n) > c$ for all $n \in (n_0, n_1)$, and $g(n_1) = c$.

Therefore, when $n_1 > n_0$, conditions (5) and (3) are verified and, by transitivity, we have

$$\int_0^{n_1} g(n)\,dn - cn_1 \; > \; \int_0^{n_0} f(n)\,dn - kn_0.$$