

Business Method Patents and Patent Floods

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“[O]ne of the great inventions of our times, the diaper service [is not patentable].”¹

Giles S. Rich

“We take this opportunity to lay this ill-conceived exception to rest.”²

Giles S. Rich

I. INTRODUCTION

The decline of the business method exception to patentability will increase the frequency of patent floods. By patent flood, I mean a dramatic jump in the number of patents filed covering a specific class of inventions, as we now observe in e-commerce.³ Floods are likely to become more frequent as future entrepreneurs respond to the appearance of a new market with a spate of business method patent applications claiming new methods tailored to the new market.

A flood of related patents in a new market creates special problems for competition in addition to the usual problems that arise

* Associate Professor of Law, Boston University School of Law. Thanks for helpful comments to Wendy Gordon, Scott Kieff, Mark Lemley, Maureen O'Rourke, Arti Rai, and participants at the American Law and Economic Association (2000) meeting, the Boston University School of Law faculty workshop, and the conference on Intellectual Property Law, Digital Technology & Electronic Commerce at Washington University Law School. This Article was prepared for the 2001 Heart of America Intellectual Property Law Conference: “Intellectual Property, Digital Technology, and Electronic Commerce” co-sponsored by Washington University School of Law on April 6-7, 2001.

1. Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 394 (1960).

2. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1375 (Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 851 (1999) (extinguishing the business method exception in a decision that confirms a diaper service is not patentable).

3. See *infra* notes 23-28 and accompanying text.

from market power associated with individual patents. Patent floods strain the resources of the U.S. Patent and Trademark Office (PTO) and adversely affect the quality of issued patents. Of particular concern, reduced patent quality increases uncertainty about the scope and validity of patents and increases the frequency of patent litigation. The fragility of the many start-ups in new markets makes them vulnerable to strategic patent litigation. The threat of patent litigation may deter entry or induce exit from the market. Furthermore, a thicket of patents may stultify development of technology because of the cost of securing patent licenses from the large numbers of patent owners.

Cross-licensing agreements and patent pools can mitigate the problems caused by patent floods, but may sometimes cause difficulties of their own. The historical record shows that some successful pooling arrangements eliminated wasteful litigation and promoted technology development. Unfortunately, other pools fostered price-fixing agreements and other anti-competitive behavior. In some industries, patent floods did not stimulate patent owners to coordinate through cross-licensing or pooling. Innovation suffered as a result.

Besides hoping that patent pools will mitigate problems caused by floods, we can take steps through patent law doctrine to reduce these problems. I argue that the PTO should use the subject matter and nonobviousness standards for patentability to limit grants of business method patents. My favored solution is reversal of *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*⁴ and restoration of the business method exception. Short of reversal, I argue for a narrow reading of *State Street* and rigorous application of the nonobviousness standard.

In Part II of this Article, I recount the story of the recent demise of the business method exception to patentability and categorize different business method patents. Some “method patents,” as defined by patent law, really protect product features. These ersatz “method patents” pose the greatest risk of patent floods and threat to competition. In Part III, I predict that as markets open in the future,

4. *State St.*, 149 F.3d at 1368.

we will often see a flood of business method patents.⁵ In Part IV, I describe the problems that follow from a patent flood: low quality patents, increased litigation, exclusionary conduct, and delay of cumulative innovation. In Part V, I address the history of patent pools and cross-licensing agreements that emerged in response to previous patent floods as well as the benefits of pools compared to the risk that pools may facilitate cartelization or other antitrust problems. Finally, in Part VI, I discuss the patentable subject matter requirement⁶ and the nonobviousness standard⁷ in determining the validity of business method patents and regulating future patent floods.

II. BUSINESS METHOD PATENTS

A. The Business Method Exception

Section 101 of the Patent Act specifies that patentable subject matter includes “any new or useful process, . . . or any new and useful improvement thereof”⁸ Despite such broad language,⁹ some processes have never been considered patentable subject matter. For example, purely mental processes are not patentable.¹⁰ Additionally, the steps of a square dance or the process of calling the dance are not patentable.¹¹ Until recently, the business method exception precluded patents on most business-related processes.¹²

5. Evidence for the prediction is the current flood of Internet related business method patents.

6. 35 U.S.C. § 101 (1952).

7. *Id.* § 103.

8. *Id.* § 101.

9. 35 U.S.C. § 100(b) provides an unhelpful definition of process as a “process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.” 35 U.S.C. § 100(b) (2001).

10. The square dance and square dance call are both copyrightable subject matter if they are original and fixed. *See* 17 U.S.C. § 102(a) (2001).

11. A patent granted on a method of gripping a golf putter. U.S. Patent No. 5,616,089 (issued Apr. 1, 1997).

12. *See* Leo J. Raskind, *The State Street Decision: The Bad Business of Unlimited Patent Protection for Methods of Doing Business*, 10 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 61 (1999) (describing the ruling as a “sweeping . . . departure from precedent”). Despite the business method exception, there are examples of business method patents throughout the last century. *See* USPTO White Paper, *Automated Financial or Management Data Processing Methods (Business Methods)*, at <http://www.uspto.gov/web/menu/busmethp/index2.htm> (last visited Mar. 22, 2001).

These classifications may stem from the failure of the courts to clearly state comprehensive principle for dividing patentable from unpatentable processes. One approach limits patents to industrial processes,¹³ while another approach limits patents to processes that manipulate artifacts or cause physical effects.¹⁴ A new standard, announced in *State Street*¹⁵ and *AT&T v. Excel*,¹⁶ expands patentable subject matter to include processes that produce a “useful, concrete and tangible result.”¹⁷ While the business method exception was compatible with the earlier and more narrow definitions of patentability, the new, expansive definition vitiates the exception.

In *State Street*, State Street Bank sought a declaratory judgment of invalidity against Signature Financial’s patent for software used to administer a type of mutual fund.¹⁸ The patent claims described a computerized accounting system that calculated daily share values. The district court ruled in favor of State Street Bank, invalidating the invention,¹⁹ under the business method exception and the

Automated financial/management business data processing method patents cannot trace their origins back to the founding of our nation. However, contrary to popular view, they did not suddenly spring into being in the late 1990s. On January 8, 1889, the era of automated financial/management business data processing method patents was born. United States patents 395,781; 395,782; and 395,783 were granted to inventor-entrepreneur Herman Hollerith on that date . . . Mr. Hollerith’s method and apparatus patents automated the tabulating and compiling of statistical information for businesses and enterprises. They were acclaimed nationally and viewed as revolutionizing business data processing. The protection of his patents allowed his fledgling Tabulating Machine Company to succeed and thrive. In 1924, Thomas J. Watson, Sr. changed the company name to International Business Machine Corporation. Hollerith manual punch cards (IBM punch cards) and his methods for processing business data were still being used up until the birth of the personal computer era.

Id.

13. See John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. REV. 1139, 1143, 1178-85 (1999).

14. See *id.* at 1147, 1174; *Ex parte Turner*, 1894 Dec. Comm’r Pat. 36, 38.

15. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S. Ct. 851 (1997).

16. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999).

17. 149 F.3d at 1373; see also *AT&T*, 172 F.3d at 1361.

18. Specifically, a mutual fund with a hub-and-spoke structure is open only to other mutual funds. It is attractive because it holds tax advantages. See *State St.*, 149 F.3d at 1370.

19. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 927 F. Supp. 502, 512-16 (D. Mass. 1996).

mathematical algorithm exception.²⁰

On appellate renew, Judge Rich denounced the business method exception as unworkable in the PTO²¹ and not firmly grounded in any case law.²² Judge Rich was slightly more deferential toward the mathematical algorithm exception, which originated in *Gottschalk v. Benson*.²³ In that case, the Supreme Court denied patent protection for computer software designed to convert one type of number into another type of number. The *State Street* district court believed Signature's invention was governed squarely by *Benson*.²⁴ Judge Rich disagreed; he argued that unlike software in *Benson*, Signature's invention achieved a useful, concrete, and tangible result, so the mathematical algorithm exception did not apply.²⁵ Essentially, *Benson* was distinguishable because Signature's method manipulated numbers representing share value.

The *State Street* decision set off a flood of e-commerce patents. The typical e-commerce patent has two distinguishing attributes: "(1) it describes an essentially commercial (as opposed to technological) activity, typically some way to make or save money; and (2) the hardware and software elements are described and claimed at such a high level of generality that they are for all practical purposes nominal."²⁶ A diverse number of business methods are now

20. *Id.* at 511. The Court stated that "the best clue to patentability [is] the mathematical algorithm/physical transformation test." *Id.* The invention at issue was not patentable because it was "designed to manipulate and record numbers." *Id.* at 514.

21. Judge Rich cited PTO guidelines stating, "Office personnel have had difficulty in properly treating claims directed to methods of doing business. Claims should not be categorized as methods of doing business. Instead such claims should be treated like any other process claim." Examination Guidelines for Computer Related Inventions, 61 Fed. Reg. 7478, 7479 (1996), cited in *State St.*, 149 F.3d at 1377.

22. *State St.*, 149 F.3d at 1375-76.

23. 409 U.S. 63 (1972). For a discussion of the mathematical algorithm exception, see generally Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer-Related Inventions*, 39 EMORY L. REV. 1025 (1990).

24. See *State St.*, 927 F. Supp. at 513-15. The district court judge was convinced that the reasoning in *In re Schrader*, 22 F.3d 290 (Fed. Cir. 1994), applied. In *Schrader*, the Federal Circuit found that the computer implemented method for bidding at an auction was unpatentable because it was a mathematical algorithm that did not give rise to any physical effect. *Id.*

25. See *State St.*, 149 F.3d at 1373-74.

26. Robert P. Merges, *As Many As Six Impossible Patents Before Breakfast: Property Rights For Business Concepts And Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 579-80 n.5 (1999).

protected. For example, the PTO issues patents covering financial instruments,²⁷ online gambling,²⁸ electronic postage,²⁹ health care administration systems,³⁰ and a method of distributing digital music.³¹

B. Taxonomy of Business Methods Patents

The following taxonomy classifies business methods in terms of their effect on market behavior. Business-related inventions can be claimed as both products and processes,³² and the business method exception is applied to both. The invention in *State Street* was claimed as a business system (i.e., machine), rather than a process, because the law once favored software claimed as part of a system over software claimed as part of a process.³³ Sensibly, the business method exception extended to such a system claims to avoid evasion of the rule. Courts could construe *State Street* narrowly to eliminate the business method exception only for business system patents, but the language in the case indicated that Judge Rich wanted to dispose of the exception entirely. *ATT v. Excel* followed soon after *State Street* and left no doubt on this matter. An AT&T invention claimed as a process involving pricing of long distance phone service was judged to be patentable subject matter.³⁴

Instead of focusing on claim format, I will focus on whether a

27. See U.S. Patent No. 5,193,056 (issued Mar. 9, 1993) (covering mutual fund); U.S. Patent No. 4,839,804 (issued June 13, 1989) (patenting a certificate of deposit that is designed to appreciate to meet college expenses); U.S. Patent No. 4,346,442 (issued Aug. 24, 1982) (patent on a system combining a charge card, a money market account).

28. U.S. Patent No. 5,800,268 (issued Sept. 1, 1998) (claiming an online gambling invention).

29. U.S. Patent No. 6,240,196 (issued May 29, 2001) (claiming electronic postage).

30. U.S. Patent No. 4,916,611 (issued Apr. 10, 1990) (claiming automated health care payment); U.S. Patent No. 5,070,452 (issued Dec. 3, 1991) (claiming a COBRA compliance system).

31. U.S. Patent No. 5,191,573 (issued Mar. 2, 1993) (claiming online music distribution).

32. Following a common practice, I use the term "product" informally to mean machine or system and the term "process" to mean process, art, or method.

33. *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) led patent applicants to favor a machine claim format for software inventions. The patentee in *Alappat* successfully claimed a software related process as a machine by using means-plus-function language. See generally 35 U.S.C. § 112 (2001).

34. U.S. Patent No. 5,333,184 (issued July 26, 1994) (long distance telephone billing system).

business method patent protects a true process innovation or a product-related innovation. To capture the distinction between process innovations and product-related innovations, I will introduce the terms *administrative method* and *customer service method* to classify business methods. Administrative methods are back-office methods that increase productivity or reduce organizational or production costs in a firm.³⁵ Customer service methods yield services that are consumed by customers or methods related to pricing, advertising, or other marketing concerns. I base this distinction on the function of the innovation in the market. Some business methods are consumable services and others are processes that contribute to business productivity.

There are two reasons to classify some business methods as product-related innovations. First, the economic definition of product encompasses goods and *services*. A service, like a massage, is consumed by an end user, and a patent on a new method of massaging protects a new product variety. Second, some method patents give *de facto* protection to a product variety as well as a process. A broad patent that protects the only method (or only practical method) of implementing a financial security extends *de facto* protection to the financial security.³⁶

Customer service method inventors may create either new product varieties or new product features.³⁷ Many business method patents

35. See, e.g., Louis Uchitelle, *Business To Business: It's Just the Beginning*, N.Y. TIMES, June 7, 2000, at H1 (discussing the increased productivity available through the Internet).

A decade ago, before the Internet, Wal-Mart connected the cash registers in its stores to its thousands of suppliers so that a shirt sold in Omaha registered with the company that made it in South Carolina. That pioneering system, however, required a huge investment in special computers and dedicated phone lines. Few other companies matched Wal-Mart's achievement, and in 1998 Wal-Mart itself switched its network entirely to the less expensive, more flexible Internet.

Id.

36. Economists speak of drastic and non-drastring process innovations. A drastic process innovation reduces the marginal cost of producing a product by a magnitude so large that no firm using a pre-existing process can compete with the innovator even if the innovator charges a monopoly price. Any process innovation of a lesser magnitude is called non-drastring. A patented drastic process yields *de facto* exclusive rights to the product produced using the process. See JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 411-12 (1988).

37. A customer service inventor may even create a new product. For example, someone may create an online method for consumer financial management, and gain exclusive rights to

could effectively provide exclusive rights to a new product variety in an established market. Examples include: the Signature Financial patent on the hub-and-spoke mutual fund,³⁸ and other securities-based patents could protect new varieties of securities;³⁹ the patent covering the use of online experts could protect a new variety of consulting;⁴⁰ the patent covering online gambling could protect a new variety of gambling;⁴¹ the patent on electronic postage protects a new substitute for the postage stamp and postal meters;⁴² and the patent on a cash management account protects a new variety of financial service.⁴³ It is too early to tell whether these patents will actually give exclusive rights to a new product variety. We must wait for more information to assess the validity and breadth of these patents. If these patents are

the market from a patent. I am not aware of any current business method patents that protect a new product, but I would not be surprised to see future examples.

38. *See supra* note 29.

39. *See supra* note 29.

40. U.S. Patent No. 5,862,223 (issued Jan. 19, 1999) (claiming the use of online experts). Similarly, a specific variety of wedding consultation might be protected by a method patent. *See* Jeffrey A. Berkowitz, *Patenting The Com In ".Com," in* ECOMMERCE: STRATEGIES FOR SUCCESS IN THE DIGITAL ECONOMY, 570 PLI/PAT 643, 665 (1999) ("The Wedding Channel has a patent for planning weddings.").

41. *See id.* at 670-71.

Having just received U.S. Patent No. 5,800,268 in September 1998, for a "Method of participating in a live casino game from a remote location," Home Gambling Network (HGN) wasted no time in enforcing its rights. In early December 1998, the company sued Interactive Television Services for patent infringement. The company then sued several other concerns, including UUNET, and settled with them in early March of 1999. Most recently, on April 6, 1999, HGN sued Starnet Communications for patent infringement.

Id.

42. *See* Berkowitz, *supra* note 40, at 669.

Pitney Bowes, Inc., the dominant player in the postage-meter business, has several patents on computer-based postage metering. That company has been in contact with two companies involved in online postage systems, E-Stamp and Stamp Master, to discuss licensing those patents. The U.S. Postal Service has approved E-Stamp's and Stamp Master's systems for buying postage over the Internet and printing it onto envelopes. Pitney Bowes filed suit against E-Stamp, charging it with infringement of the Pitney Bowes patents.

Id.

43. *See* Paine Webber v. Merrill Lynch, 564 F. Supp. 1358 (D. Del. 1983) (holding that the patented invention combined a securities account, a money market account, and a credit card; advantage of this combination was better cash management (less idle cash), a higher credit limit on the credit card, and integrated monthly statements.).

valid but have a relatively narrow scope, that would leave the patent holder with an advantage in the market for the new variety, but no exclusivity.

Other method patents relate to new or improved product features instead of new products or product varieties. For example, many e-commerce patents protect features of Internet retailing sites. Patents are granted on: an online auction method;⁴⁴ a method for real-time payments for Internet transactions;⁴⁵ and a patent for an online method of evaluating credit risk;⁴⁶ a method for paying web users who view web advertising;⁴⁷ credit card security methods;⁴⁸ methods of protecting consumer privacy;⁴⁹ and a method of using one mouse click.⁵⁰ Broad and valid patents of this sort allow a patent owner to differentiate its retail site by offering attractive and unique features. Customer service methods also include contract terms and other marketing strategies that economists treat like product features. Recent patents cover: airline ticket options;⁵¹ a method related to long-distance telephone pricing;⁵² a method that gives buyers price discounts based on the volume of orders;⁵³ electronic distribution of coupons;⁵⁴ and customized Internet promotions.⁵⁵

44. U.S. Patent No. 5,794,207 (issued Aug. 11, 1998).

45. U.S. Patent No. 5,974,146 (issued Oct. 26, 1999).

46. See Berkowitz, *supra* note 40, at 666 (discussing automated loan decision patents).

47. See *id.* at 661.

48. See U.S. Patent No. 5,724,424 (issued Mar. 3, 1998).

49. See Berkowitz, *supra* note 40, at 666.

50. The specification of U.S. Patent No. 5,960,411 (issued Sept. 28, 1999) states,

The present invention provides a method and system for single-action ordering of items in a client/server environment. The single-action ordering system of the present invention reduces the number of purchaser interactions needed to place an order and reduces the amount of sensitive information that is transmitted between a client system and a server system.

See also Theresa Riordan, *Patents Considered Vital to Thrive on the Internet*, N.Y. TIMES, Dec. 20, 1999, at C39 (reporting that Amazon.com holds a patent on a system that enables repeat online customers to avoid re-entering data when placing an order).

51. See U.S. Patent No. 5,797,127 (issued Aug. 18, 1998); Merges, *supra* note 26, at 579-80 n.5 (describing a patent that “covers ‘airline ticket options,’ i.e., the purchase and sale of the right to buy tickets at a later time for a specified price”).

52. See *supra* note 34.

53. See Berkowitz, *supra* note 40, at 666.

54. See U.S. Patent No. RE34,915 (issued Apr. 25, 1995).

55. See U.S. Patent No. 6,009,411 (issued Dec. 28, 1999) (claiming a method for distributing promotions over the Internet).

Administrative method patents reach all sorts of management techniques. There are financial method patents relating to the analysis and presentation of financial data.⁵⁶ There are patents on inventory and distribution management methods.⁵⁷ There is a patent on a payment system.⁵⁸ Various Internet-based manufacturing consulting inventions are probably patentable.⁵⁹ There are even patented law-related administrative methods.⁶⁰

Patenting customer service methods is more problematic than patenting administrative methods. Since customer service methods are closely connected to a particular market, the opening of a new market will induce a flood of customer service method inventions and patents. Administrative method inventions are less tied to a particular market and should not create the same risk of floods. Interestingly, proponents of business method patents tend to point to administrative method inventions to make their case, and opponents point to customer service methods. The recent PTO White Paper emphasizes that business method inventions in Class 705, automated data processing methods, follow a long tradition of invention in the field of data processing machinery like the IBM tabulator machine.⁶¹ On

56. See U.S. Patent No. 5,940,810 (issued Aug. 17, 1999) (claiming a method used to value securities); see also Berkowitz, *supra* note 40, at 665 (“Block Financial Corp. received a patent for accessing recent financial information from a variety of providers using a variety of presentation tools.”).

57. See U.S. Patent No. 4,528,643 (issued July 9, 1985) (covering a method of digital music distribution).

58. See *supra* note 30 (describing a health care payment method).

59. See Douglas Frantz, *To Put G.E. Online Meant Putting a Dozen Industries Online, E-Commerce: A Special Section*, N.Y. TIMES, Mar. 29, 2000, at H29 (describing three innovations at General Electric that are patentable subject matter after *State Street*). GE developed a Web site where its engineers in 100 countries can share ideas and work on projects simultaneously. *Id.* Next, G.E. created “‘wizards’ that enable customers to solve complex problems on the Web. A design engineer at a manufacturing company, for example, can log on to the G.E. plastics site and use a specialized engineering calculator to determine a polycarbonate’s strength, adhesion and color.” *Id.* Finally, the G.E. aircraft-engines business implemented imaging methods through a Web site in a way that cuts the cost of engine repairs. In the past, a G.E. representative would visit a customer and inspect engine parts to decide whether they could be retained or rebuilt, or discarded for a new part. Now, much of that work can be done cheaply and quickly over the Internet with images transmitted from the customer to G.E. *Id.*

60. See *supra* note 30; see also Riordan, *supra* note 50, at C39 (describing a patent on a method of allocating assets in a divorce settlement); U.S. Patent No. 6,246,991 (issued June 12, 2001) (patenting software for implementing multimedia wills).

61. See generally USPTO White Paper, *supra* note 12. Business machines play a role in a firm comparable to an administrative method. For example, the photocopier is a durable

the other hand, opponents point to the patents on securities and ask whether there was adequate incentive for financial innovation without patents.⁶²

III. PATENT FLOODS

A patent flood occurs when many inventors apply for patents on similar inventions during an interval of a few years.⁶³ A recent example is the flood of gene patents.⁶⁴ The development of efficient gene sequencing technology and the Human Genome Project provided the impetus for a flood of gene discoveries and patents.⁶⁵ Earlier patent floods occurred in the motion picture, airplane, and petroleum-refining industries. The motion picture and airplane patent floods followed the efforts of Edison and the Wright brothers demonstrating technical feasibility of the motion picture and the airplane. The flood of petroleum refining patents followed the discovery of the cracking process of refining. The flood of e-commerce and other business method patents⁶⁶ is the latest patent flood.

There has been a dramatic rise in the number of business method patents since *State Street*.⁶⁷ In particular, the number of e-commerce

business machine that provides a flow of copying service. A substantial portfolio of patents relating to xerography gave Xerox a monopoly in the market for photocopiers. *See* SCM Corp. v. Xerox Corp., 645 F.2d 1195, 1204 (2d Cir. 1981). Buyers and lessees value this copying service the same way they value an administrative method that reduces some other administrative cost. If Xerox invented and patented an administrative method related to document management that drastically reduced the number of copies required by organizations, the economic effect would have been quite similar to the actual case.

62. *See* Pollock, *infra* note 129; *see also infra* note 130.

63. *See* Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting*, *5, at <http://www.haas.berkeley.edu/~shapiro/thicket.pdf> (Mar. 2001) (noting recent patent floods in various industries).

64. *See generally* Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 *SCIENCE* 698 (1998).

65. *See* Andrew Pollack, *Approaching Biology from a Different Angle: Scientist at Work: Leroy Hood*, N.Y. *TIMES* (Apr. 17, 2001), at www.nytimes.com/2001/04/17/health/17HOOD.html.

66. *See* Richard H. Stern, *Scope-of-Protection Problems with Patents and Copyrights on Methods of Doing Business*, 10 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 105, 154 (1999) (“Given the boom or land rush in applications for patents on methods of doing business, particularly in regard to electronic commerce, the matter is urgent.”).

67. *See* Sabra Chartrand, *Patents: E-Commerce Spurs Changes at Patent Office*, N.Y. *TIMES*, Apr. 3, 2000, at C6. In 1997, the PTO established “department 570” for business

patents jumped,⁶⁸ as have the number of financial patents.⁶⁹ Two factors jointly caused the flood of e-commerce patents: (1) the introduction of the Internet; and (2) the demise of the business method exception. The introduction of the Internet is a technical breakthrough equivalent to the Wright brothers' flight at Kitty Hawk. The Internet makes e-commerce possible and e-commerce creates new opportunities for invention.

Equally, the expansion of patentable subject matter sanctioned by *State Street* caused the flood of e-commerce patents since most of the e-commerce inventions would not be patentable subject matter under pre-*State Street* standards. In contrast, the flood of financial patents is caused strictly by the demise of the business method exception because there has not been a technical breakthrough in the financial services industry.⁷⁰

Eliminating the business method exception will increase the frequency of future patent floods. Past patent floods were set off by a technical breakthrough. Such technical breakthroughs will continue to occur to set off patent floods. Any change in patent law that increases the range of patentable subject matter will naturally

method patents. Applications rose from 920 in 1997, to 1,300 in 1998, and to 2,600 in 1999. In 1999, the PTO issued 583 business method software patents. *Id.*

68. See Stern, *supra* note 66, at 154; see also Riordan, *supra* note 50. There are about half a dozen firms modeled after Walker Digital, each hoping to become patent factories. Walker Digital received thirty patents including the key Priceline.com patent covering online auctions and also has 300 pending patent applications. *Id.*

69. Josh Lerner, Where Does State Street Lead? A First Look at Finance Patents, 1971-2000, *7-8, at <http://www.people.hbs.edu/jlerner/StateStreet.pdf> (last visited Feb. 22, 2002) (describing a dramatic increase in the number of financial patents starting in 1997).

70. Defenders of the *State Street* decision disagree with my view that the case eliminated the business method exception. Both Judge Rich and Judge Newman, searched the case law and found only weak support in dicta establishing a business method exception. *In re Schrader*, 22 F.3d 290, 297-98 (Fed. Cir. 1994). Judge Rich intended to dispel the misperception that a business method exception existed. He argued that cases supposedly standing for the business method exception could be better explained through application of the rule that abstract principles are unpatentable. Although I think his treatment of the cases is reasonable, Judge Rich evades the longstanding PTO rule against patents on business methods and the consensus among commentators, including himself at an earlier date, that there was a business method exception. For further critical commentary, see the excellent analysis in Thomas, *supra* note 13. Whether *State Street* eliminated the business method exception or simply clarified established law, it set off a flood of business method patents. Defenders of *State Street* admit this result, but blandly assert that *State Street* made practitioners aware of a class of inventions they previously overlooked. See USPTO White Paper, *supra* note 12.

increase the frequency of patent floods by bringing a wider range of technology within the ambit of patent protection. Thus, the *Chakrabarty* decision, which confirmed that living organisms are patentable subject matter, increased the likelihood of biotechnology patent floods by broadening the range of biotechnology that is patentable. *State Street* has the same of effect by making software implemented business methods patentable.

However, *State Street* has two other effects that create special concern. First, a technological breakthrough is no longer a precondition for a patent flood. Any factor that opens a new market might set off a future flood of business method patents. New markets often yield various new methods of doing business—all of which can now be patented. Second, future technological breakthroughs might set off two different patent floods: a flood of patents covering the relevant technology and a flood of patents covering business methods in the new market opened by the breakthrough.⁷¹

Fears about future business method patent floods could be allayed by a narrow interpretation of *State Street* and a rigorous application of the nonobviousness standard. The courts, though, may allow a broad reach of patent law to all sorts of business methods⁷² with a modest role for the nonobviousness requirement. A broad reading of *State Street* allows business method claims that do not mention

71. Note that even if the technical breakthrough does not set off a flood of technology-based patents, it is possible it will set off a flood of business method-based patents.

72. Several scholars expressed concern about the broad reach of *State Street*. See, e.g., Stern, *supra* note 66, at 154 (“Accordingly, a line of subsequent poor decisions based on *State Street* should be anticipated.”); see also Raskind, *supra* note 12, at 91.

A further source of unease over this opinion is its potential for generating a boom in business method patents. This protection extends to fields other than financial services Banking, insurance, and accounting are most likely to be immediately involved in seeking such patent protection. However, protection is unlikely to be limited to these sectors.

Id.; John R. Thomas, *The Post-Industrial Patent System*, 10 FORDHAM INTELL. PROP. MEDIA & ENTER. L.J. 3, 4 (1999).

In its place the Federal Circuit required only that a claimed process achieve a useful result, an exceptionally lenient standard that appears to place few limitations on the possibilities for private appropriation. Keenly aware of these holdings, applicants have besieged the Patent Office with applications ranging from financial software to Internet-based business models.

Id.

software.⁷³ Judge Rich apparently acknowledged that the pre-computer method, in *Hotel Security Checking Co. v. Lorraine Co.*,⁷⁴ is patentable subject matter. This patent covered a manufacture and process designed to prevent waiters and other restaurant employees from falsifying sales and receipts. Judge Rich explained that the patent was invalidated on obviousness grounds and not because it claimed a business method. After *State Street*, he would also determine a diaper service to be patentable subject matter. More significantly, basic business method innovations like the distribution system at Sears,⁷⁵ the multi-divisional structure of the firm, and the Fed-Ex hub-and-spoke air delivery system are now likely to be patentable subject matter.

IV. PROBLEMS CAUSED BY PATENT FLOODS

Patent floods can exacerbate three social costs attributable to patents: (1) high licensing and litigation costs; (2) exclusionary misuse of patents; and (3) a retarding effect on diffusion and cumulative innovation.⁷⁶ Patents deter entry or induce exit of firms competing with a patent owner. Exclusion of competitors is justified when a firm owns a strong and valid patent. However, exclusion can also be achieved with the aid of weak or invalid patents. A large firm

73. See *Merges*, *supra* note 26, at n.24; *cf.* *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, No. 00-1109, 2001 U.S. App. LEXIS 2163, at *44 (Fed. Cir. Feb. 14, 2001) (holding that the '411 patent specification states that "one skilled in the art would appreciate that the single-action ordering techniques can be used in various environments other than the Internet").

74. 160 F. 467 (2d Cir. 1908).

75. Sears devised a distribution method that gave it a great cost advantage in retailing in the early 1900s. See ALFRED D. CHANDLER, JR., *SCALE AND SCOPE: THE DYNAMICS OF INDUSTRIAL CAPITALISM* 59-62 (1990).

The heart of the operation . . . was the scheduling system, which helped assure consistently high stock-turn. A complex, rigidly enforced timetable made it possible to fill a steady stream of orders from a large number of different departments. Each department was given fifteen minutes to send the assembling rooms the items listed on a specific order. If any items failed to appear within that time period, the order was shipped without them. The delayed part of the order was sent by prepaid express as soon as it was ready, and the negligent department was charged both for the extra express cost and for a fine of fifty cents per item.

Id. at 61.

76. For a similar list of social costs associated with patents, see Kenneth Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247 (1994).

can use the threat of patent litigation to drive smaller firms out of a market. The threat may succeed even if the patent is likely invalid or the defendant is unlikely to be an infringer. The high cost of defending a patent suit can strain the financial resources of a small start-up company. Potential entrants will survey market niches and try to steer clear of niches with many patents so they can reduce the risk of patent litigation.

Although patents certainly promote innovation, they also retard diffusion of technology and cumulative innovation. Patent owners slow diffusion by refusing to license their patents, or more commonly, by charging royalties that discourage efficient use of patented inventions. Patent owners slow cumulative innovation by bargaining for a share of the surplus created by inventors who improve the patented invention or use it in their research.⁷⁷ Naturally, the incentive to improve patented inventions is diminished compared to the case in which the improver keeps the entire surplus from the improvement.

Patent floods lead to lower quality patents exacerbating the first two social costs. “Low patent quality” is shorthand for such problems as overlapping claims, inappropriately broad claims, slow patent prosecution, and patents on obvious inventions.⁷⁸ The problem of overlapping claims is inherent to patent floods because of the likelihood of near simultaneous invention and multiple patent applications covering the same invention. The other problems arise because of the difficulty the PTO has dealing with patent floods.⁷⁹ Time pressure, lack of expertise, and lack of prior art yield low patent quality during floods.⁸⁰ The PTO directs patent applications to

77. Improvers are usually infringers and need a license from the patent owner of the basic invention.

78. See *Merges*, *supra* note 26, at 590 (discussing the low quality of software and business method patents); see also *Lerner*, *supra* note 69, at 24. U.S. Patent No. 5,884,286 (issued Mar. 16, 1999) entitled “Apparatus and process for executing an expiration less option transaction.” Patent does not cite a wealth of academic prior art that quite possibly makes the invention unpatentable. *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 2001 U.S. App. LEXIS 2163 (Fed. Cir. Feb. 14, 2001) (reversing a preliminary injunction against Barnes and Noble because of substantial questions regarding patent validity).

79. Even a well-run PTO will suffer from these problems. For a general explanation that good patent policy calls for limited resources and a limited examination process, see Mark Lemley, *Rational Ignorance at the Patent Office*, 95 NW. L. REV. 1495 (2001).

80. The PTO has instituted a mandatory second review of business method patents to

examiners in the field of technology appropriate for the claimed invention. A flood in a particular field means that the average time to complete prosecution rises as resources are stretched.⁸¹ The demand for skilled people in the emerging area of technology makes it difficult to attract and retain examiners in the field.⁸² And the technical breakthrough precipitating a flood might take a while to enter the prior art.⁸³

Low patent quality increases patent licensing and litigation cost. These costs increase because bargaining becomes more difficult and the probability of patent disputes grows as quality deteriorates. Delayed patent prosecution, and numerous and overlapping patents, make it costly for a possible infringer to negotiate a license or even determine with whom to bargain. Overly broad claims inappropriately expand the number of potential infringers and the probability of litigation. Additionally, when numerous inventors⁸⁴ own related patents and patent applications, there are apt to be disputes about priority or the scope of similar claims.⁸⁵

Periods of patent flood magnify the problem of exclusionary conduct. Patent floods often coincide with the birth of a new industry. The normal life-cycle of an industry begins with a large number of small firms, followed by a period of shake-out when many firms

increase the quality of the examination process. See William M. Bulkeley, *Fewer Patents on Methods Get Clearance*, WALL ST. J., Mar. 21, 2001, at A3.

81. See Chartrand, *supra* note 67, at C6 (noting that the PTO recently increased training, supervision, and staff in response to complaints about examination of business method patents).

82. See *id.* *Patenting Business Methods, A White Paper of the AIPLA*, at www.aipla.org/html/whitepaper2.html (Nov. 27, 2000) (calling for better training of examiners and better collection of prior art by the PTO).

83. See Lerner, *supra* note 69, at 26-27; see also Sabra Chartrand, *Federal Agency Rethinks Internet Patents: Government Changing Its Evaluations of Business-Method Filings*, N.Y. TIMES, Mar. 30, 2000, at C4 (quoting critics who claim the PTO does not “understand what business methods are widely used or already in the public domain”).

84. The flood of finance patents is distributed to a large and diverse collection of patent owners. See Lerner, *supra* note 69, at 9.

85. See Teresa Riordan, *Patents: Historians Take a Longer View of Net Battles*, N.Y. TIMES, Apr. 10, 2000, at C1 (“The most extreme example of simultaneous development is when you have Alexander Graham Bell and Elisha Gray arriving at the patent office on the same day with the idea of the telephone,” said the author of “Media Technology and Society: A History From the Telegraph to the Internet.”).

Gray and Bell settled their differences, with Gray getting a \$100,000 settlement and lucrative contract work. But the early days of the telephone were marked by many other patent disputes. At one point the Bell System had 600 pending patent infringement cases. *Id.*

fail.⁸⁶ Thus, there is a large population of start-ups that are vulnerable to exclusionary tactics. Low quality patent examination makes it easy for a dominant firm intent on exclusion to collect a portfolio of patents.⁸⁷ Even if the patent flood does not promote socially unwarranted exclusionary tactics, it may have a negative impact on industry evolution. The patent flood raises the cost of entry to the new market, and overly broad or invalid patents may favor inefficient producers who survive the shake-out at the expense of more efficient, but patent-poor firms.⁸⁸

These problems are becoming apparent in e-commerce markets that entered the shake-out phase.⁸⁹ Commentators predict huge amounts of patent litigation.⁹⁰ Weak or invalid business method

86. See Steven Klepper & Elizabeth Graddy, *The Evolution of New Industries and the Determinants of Market Structure*, 21 RAND J. ECON. 27, 28-35 (1990) (gathering evidence that shows that new industries first experience rapid entry, followed by a shake-out phase when many more firms exit than enter, and finally a mature phase with a steady number of firms).

87. Dominant firms can patent their own inventions and purchase patent rights from other firms, especially those exiting the market during a shake-out. See, e.g., Kevin G. Rivette & David Kline, *Discovering New Value in Intellectual Property*, 78 HARV. BUS. REV. 54, 64 (2000) (a stent manufacturer bought out a company to gain access to its patent portfolio to bolster its position in a patent infringement suit); Gwendolyn Mariano, *Net Shakeout More Sweeping Than Expected*, at <http://news.cnet.com/news/0-1005-200-6186603.html> (June 4, 2001) (describing the "incredible" rate of acquisition of failed Internet firms).

88. See Klepper & Graddy, *supra* note 86, at 28. In this model, "factors governing the early evolution of industries will shape their market structure at maturity." *Id.* Specifically, the model shows that increasing the cost of imitation in a new industry tends to raise the level of concentration as the industry matures. See also Rivette & Kline, *supra* note 87, at 66 (arguing that patents are often decisive in determining which firms survive the shakeout phase of the industrial life cycle).

89. See Bob Tedeschi, *When Digital Darwinists Seek Their Predators*, N.Y. TIMES, June 26, 2000, at C10 (describing a shake-out of Internet retailers causing a wave of consolidation); Mariano, *supra* note 87; see generally Rochelle Cooper Dreyfuss, *Are Business Method Patents Bad for Business?*, 16 SANTA CLARA COMPUTER & HIGH TECH. L.J. 263 (2000).

90. For example, the two major remaining providers of free Internet access are suing each other over infringement of patents that cover aspects of Internet advertising critical to their business model. See Matt Richtel, *NetZero Sues Juno Online in a Patent Dispute Over Advertising*, N.Y. TIMES, Dec. 28, 2000, at C3. Stern, *supra* note 66, at 105 n.98.

See "Boom" in *Business Method Patent Filings Has Followed State Street Ruling*, PTO SAYS, PAT. TRADEMARK & COPYRIGHT J. (BNA) 115 (Dec. 10, 1998). *Forbes* suggests that e-commerce magnates may "try to turn patents into the barbed wire of the Internet." Josh McHugh, *Barbed Wire on the Internet*, FORBES, May 17, 1999, at 183. The *American Banker* asserts that the *State Street* decision "threatens to embroil the financial services industry in hundreds of patent infringement lawsuits, creating possible liability exceeding \$2 billion." Jaret Seidberg, *Ruling Threatens Banks With Patent Lawsuits*, AM. BANKER, Sept. 2, 1998, at 3. A story in IP Magazine warns that "a firestorm of litigation threatens to engulf corporate

patents might be used to deter entry,⁹¹ or induce firms to accept licenses.⁹² Moreover, patent suits will shape the structure of the industry by encouraging mergers.⁹³

Patent floods also exacerbate the costs from slowed diffusion and cumulative innovation.⁹⁴ The transaction costs associated with obtaining numerous licenses may retard technical progress.⁹⁵ These transaction costs probably rise faster than the number of patents because multilateral bargaining is more difficult than bilateral bargaining. Furthermore, the flood of patents increases the likelihood that different parties will own patents on complementary inventions—i.e., inventions that efficiency dictates should be used

America” and predicts “large-scale disruption of U.S. commerce, as sharp operators move to patent business methods and assert patents against the unsuspecting.” Robert M. Kunstadt, *Opening Pandora's Box*, IP MAG., Jan. 1999, at <http://www.ipmag.com/monthly/99-jan/kunstadt.html> (last visited May 12, 1999).

91. See Shapiro, *supra* note 63, at 34.

Our current patent system is causing a potentially dangerous situation in several fields, including biotechnology, semiconductors, computer software, and e-commerce in which a would-be entrepreneur or innovator may face a barrage of infringement actions that it must overcome to bring its product or service to market. In other words, we are in danger of crea[t]ing significant transactions costs for those seeking to commercialize new technology based on multiple patents, overlapping rights, and hold-up problems.

Id.; Dreyfuss, *supra* note 89, at 270 (noting that an entry deterrent effect created by business method patents that are likely to be invalid).

92. See Seth Shulman, *Software Patents Tangle the Web*, 103 TECH. REV. 68, 71-72 (2000). There will be a lot of cross-licensing of e-commerce patents because many of the patents are invalid. Even though the odds of invalidity are high, the patents are powerful weapons. *Id.*

93. See generally James Gleick, *Patently Absurd*, N.Y. TIMES MAG., Mar. 12, 2000, at 44 (predicting that new e-commerce patents will continue to flood the PTO and surprise entrepreneurs; patent suits are a catalyst for mergers).

94. See Matt Richtel, *Chairman of Amazon Urges Reduction of Patent Terms*, N.Y. TIMES, Mar. 11, 2000, at C4. The chairman of Amazon.com has acknowledged that business method patents may stifle others from building on patented innovations. “He is calling for the government to limit patents for software and Internet business models to three to five years and to require a period for public comment on patent applications in those areas before they are granted.” *Id.*

95. See Heller & Eisenberg, *supra* note 64; Riordan, *supra* note 85 (quoting historian Amy Friedlender: “‘A radio patent pool was finally formed in 1919’ . . . ‘One of the reasons it was formed was there were so many patents and so much cross-licensing that development of radio had become almost sclerotic’”); Shulman, *supra* note 92, at 76 (describing a thicket of patents that created problems for development of automobiles and airplanes in the United States).

together. The owners of complementary patents have an incentive to charge combined license fees even higher than the monopoly license fee.⁹⁶ Finally, when a technical breakthrough opens a new market, a flood of business method patents could block commercial exploitation of the underlying technology. The cost of negotiating appropriate business method patent licenses reduces the incentive effect of broad patent protection for a technical pioneer.⁹⁷

V. CAN POOLING AND CROSS-LICENSING SOLVE THE PROBLEMS CREATED BY PATENT FLOODS?

Patent floods usually induce extensive patent licensing managed through patent pools or cross-licensing agreements.⁹⁸ A patent license is a contract in which a patent owner grants the licensee permission to practice the patented invention.⁹⁹ Cross-licensing describes reciprocal patent licenses that two or more patent owners grant to each other. Pooling is more comprehensive than cross-licensing. Patent pools include many members and gather most or all of the patents in an industry.¹⁰⁰ Typically, a pool issues a blanket license authorizing use of all the patents in the pool.¹⁰¹ The license revenue is distributed to members in proportion to the value of the patents they contributed to the pool.¹⁰²

Pools and cross-licensing mitigate two of the negative effects of patent floods, but sometimes create new problems. They reduce transaction costs and avoid the uncertainty of litigation cost created by a flood of patents.¹⁰³ The blanket license eliminates worries about

96. See Shapiro, *supra* note 63, at 6-10 (arguing that complementary patents are priced too high and hidden patents create a danger of hold-up).

97. Thanks to Pam Samuelson for suggesting this point.

98. Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293, 1341 n.162 (1996) (citing patent consolidation in over twenty industries in the early part of the twentieth century).

99. A patent owner may refuse to license without violating antitrust law. See *SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1204 (2d Cir. 1981). But see JEAN TIROLE, *THE THEORY OF INDUSTRIAL ORGANIZATION* 410-13 (1988) (citing the many benefits to licensing).

100. Members of the pool assign their patents to a holding company or trade association. See Merges, *supra* note 98, at 1341-42.

101. See *id.*

102. See *id.*

103. George L. Priest, *Cartels and Patent License Arrangements*, 20 J.L. & ECON. 309,

patent litigation based on any of the patents in the pool. Transaction costs are low because monitoring costs are reduced for patent owners and licensees only need to negotiate a single blanket license. For the same reasons, they also cut through a thicket of patents that otherwise could stall production and development in an industry facing a patent flood.¹⁰⁴ On the other hand, pooling and cross-licensing cause a variety of anticompetitive harms.

Antitrust law shows considerable deference to patent licenses.¹⁰⁵ The owner of a broad patent on an important invention is supposed to enjoy significant exclusionary power and monopoly profit regardless of whether the patent is licensed. High profit provides the incentive to seek important inventions. Thus, a cross-license agreement should secure monopoly profits for the owners of a pair of essential, complementary inventions.¹⁰⁶ A similar statement holds for licenses settling priority disputes. A license that allows two inventors to split the monopoly profit from an invention serves social welfare if one of them is surely entitled to the patent.¹⁰⁷ Despite these benefits anticompetitive harms do exist. Pools and cross-licensing can insulate invalid patents from challenge, expand the scope of minor patents, and facilitate collusive pricing.

Pools and cross-licensing pose anticompetitive threats because: it is hard to distinguish settlement of a legitimate priority dispute from a cross-license between the owners of two sham patents; and it is hard to distinguish settlement of a legitimate dispute about scope of

358-59 (1977) (noting that pools reduce litigation and uncertainty); Robert P. Merges, Comment, *Of Property Rules, Coase, and Intellectual Property*, 94 COLUM. L. REV. 2655 (1994) (noting that patent pooling in the radio industry reduced transaction costs).

104. The PTO touted patent pools as the solution to the problem created by the thicket of gene patents. See USPTO, *Patent Pools: A Solution to the Problem of Access in Biotechnology Patents?*, at www.uspto.gov/web/offices/pac/dapp/opla/patpoolcover.html (Jan. 19, 2001); see also Shapiro, *supra* note 63 (approving pooling of complementary patents to fight through patent thicket).

105. Joint price and output choice are not per se illegal when practiced by a pool. See, e.g., *Broadcast Music, Inc. v. CBS*, 441 U.S. 1, 23 (1979) (discussing price fixing by a copyright pool).

106. More precisely, if the single owner of the pair of complementary patents can command a monopoly profit, then two owners should be allowed to obtain the same profit through cross-licensing.

107. Again, if the patent securely in the hands of one of the inventors generates monopoly profit, then no problem exists with a license that allows two inventors to split the monopoly profit.

claims and infringement from a cross-license between the owners of two minor patents.¹⁰⁸ Many patents issued during a flood cover insignificant inventions and many patents are invalid. Licensing to settle patent litigation might be a socially desirable way to avoid litigation cost, but it also might be part of a collusive strategy.¹⁰⁹

The other anticompetitive threat is a pool or cross-licensing agreement justified as a way to cut through a patent thicket and economize on transaction costs might actually serve merely to orchestrate collusion on prices. A patent license may include terms that would normally violate the antitrust rule against price fixing. For example, a license might specify the sale price, geographic market, or output level of the end product made using a patent.¹¹⁰ Such terms make it easier to establish and enforce a cartel.¹¹¹ If the patents in the pool are substitutes, the effect is similar to firms merging to monopoly.¹¹² Antitrust law gives us many likely examples of patent pools facilitating collusion.¹¹³

108. Pooling or cross-licensing patents on competing technologies may be anticompetitive if excluded firms need a license to effectively compete in the relevant market. *See* U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY (1995) [hereinafter ANTITRUST GUIDELINES], *available at* <http://www.usdoj.gov/atr/public/guidelines/ipguide.htm> (last visited Apr. 12, 2001).

109. *See* Michael J. Meurer, *The Settlement of Patent Litigation*, 20 RAND J. ECON. 77 (1989); *see, e.g.,* Priest, *supra* note 103, at 309-10 (describing the difficulty in distinguishing legitimate patent exploitation from patent licenses used to orchestrate a cartel).

110. *See* LAWRENCE A. SULLIVAN & WARREN S. GRIMES, *THE LAW OF ANTITRUST: AN INTEGRATED HANDBOOK* 830-31 (2000).

111. George Priest suggested the license agreement between G.E. and Westinghouse might have been used to fix price. *See* Priest, *supra* note 103. *But see* *United States v. Gen. Elec. Co.*, 272 U.S. 476 (1926) (sustaining validity of the patent license). *See also* Ian Ayres, *How Cartels Punish: A Structural Theory of Self-Enforcing Collusion*, 87 COLUM. L. REV. 295 (1987); Summit Tech., Inc., No. 9286 (Aug. 21, 1998), *available at* <http://www.ftc.gov/os/1998/9808/d0928viagr.htm> (FTC claimed a patent pool was protecting an invalid patent).

112. *See* Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 HARV. L. REV. 1815, 1867-68 (1984).

The problem of patent accumulation, the aggregation of several or numerous patents under single ownership or control, is conceptually indistinguishable from the merger problem under antitrust law A pool of competing patents can be more readily analogized to a loose association than to a horizontal merger. This, of course, depends upon one's evaluation of the pool's efficiency-creating potential. A pool of competing patents is difficult to distinguish from the cartel in this respect.

Id.

113. *See, e.g.,* *Hartford-Empire Co. v. United States*, 323 U.S. 386 (1945); *Standard Sanitary Mfg. Co. v. United States*, 226 U.S. 20 (1912); Robert P. Merges & Richard R.

The risk of price-fixing disguised as a patent pool is surely decreased by the threat of antitrust enforcement—likewise agreements that expand patent scope or protect invalid patents. Yet, deterrence alone is probably inadequate because of a substantial danger of undetected collusion.¹¹⁴ Deterrence is also limited because enforcement agencies fear that overzealous antitrust enforcement will discourage socially desirable patent pools and cross-licenses. The Department of Justice (DOJ) announced guidelines that help fine tune public antitrust enforcement.¹¹⁵ But, we should not be too optimistic that antitrust law can finely distinguish pro-competitive from anti-competitive pooling and cross-licensing.¹¹⁶

My discussion so far suggests that pooling or cross-licensing inevitably follows a patent flood—but that is not true. The multi-party bargaining problem facing patent owners is a major impediment. History shows that agreements are easier to reach in industries with homogeneous members who deal with each other repeatedly.¹¹⁷ History also shows longstanding bargaining impasses

Nelson, *On The Complex Economics Of Patent Scope*, 90 COLUM. L. REV. 839, 896 (1990) (illustrating cartelization by the light bulb patent pool); Merges, *supra* note 98, at n.224 (describing cartelization by pool in *United States v. National Lead Co.*, 63 F. Supp. 513, 523 (S.D.N.Y. 1945), *aff'd*, 323 U.S. 319 (1947)); Priest, *supra* note 103, at 330-32 (describing the pooling of harrow patents used to cartelize the harrow market); *id.* at 366-70 (weighing strong evidence of both efficiency and collusion in relation to a pool of patents relating to methods of refining petroleum).

114. See Priest, *supra* note 103, at 329 (noting that with cross-licensing it is more difficult to distinguish cartelization from legitimate exploitation); Kaplow, *supra* note 112, at 1865-67. Antitrust scrutiny failed to detect collusion in *Standard Oil Co. v. United States*, 283 U.S. 163 (1931) (upholding a pool comprised of competing patents when its examination failed to uncover any restraint of trade or monopolization).

115. Two important rules of thumb are that pooled patents should be complements not substitutes. See Priest, *supra* note 103, at 357-58 (distinguishing cross-licensing of substitute and complementary patents). Pool members must reasonably fear infringing each others' patents. See Merges, *supra* note 98, at 1293 n.225 ("Where industry members are seen to pervasively infringe each other's patents, and where valuation and exchange mechanisms appear to serve no ulterior purpose beyond setting compensation for these infringements, a real working pool is in effect."). The DOJ view pooling as procompetitive when it integrates complementary inventions, and reduces transaction and litigation costs. See ANTITRUST GUIDELINES, *supra* note 108. Open licensing of non-members helps protect a pool from antitrust violation. See Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479, 538 (1998); cf. USPTO, *supra* note 104 (encouraging patent pooling as a solution to the problems caused by the flood of gene patents).

116. See Priest, *supra* note 103; Merges, *supra* note 98.

117. See Merges, *supra* note 98, at 1341.

are possible.¹¹⁸ In addition, the threat of antitrust litigation may deter some pools and cross-licensing agreements.¹¹⁹

VI. FLOOD CONTROL: REDUCING THE FREQUENCY OF BUSINESS METHOD PATENT FLOODS

Sections 101 and 103 of the Patent Act offer opportunities to reduce the frequency of patent floods either by limiting the extent to which business methods are patentable subject matter or by making it difficult to show business method inventions are nonobvious.¹²⁰ At this early stage we cannot be sure how broadly the Federal Circuit will read *State Street*. Experience with software patentability suggests the court will read it quite broadly.¹²¹ It is also too early to know how rigorously the § 103 non-obviousness requirement will be applied to business methods.

Two questions left open after *State Street* are critical to determining the extent of business method patentability. First, are business methods that lack a software implementation patentable? Second, what kinds of methods are useful, tangible, and concrete? *State Street* and the follow-up case, *AT&T v. Excel*, are surprisingly

118. See Merges & Nelson, *supra* note 113, at 896-97.

There is therefore no guarantee that pooling, cross licensing, or consolidation will always emerge to break an industry impasse. And without these solutions there is nothing to mitigate the effect of broad basic patents in cumulative technology industries. Earlier we saw that theory offered a number of reasons to be concerned about these patents. The historical evidence available is consistent with this theory. In most instances this evidence can be read as supportive of our concerns about the effects of broad patents on cumulative technology industries.

Id.

119. See Merges, *supra* note 98, at 1355. But favorable business review letters from the DOJ encouraged three recent patent pools. The DOJ issued business review letters sanctioning three recent patent pools to share royalties from patents covering the Moving Picture Expert Group (MPEG) 2 compression technology standard, and patents on certain digital video disc (DVD)-Video and DVD-ROM standard specifications and products. See generally *supra* note 104; Steven C. Carlson, Note: *Patent Pools and the Antitrust Dilemma*, 16 YALE J. ON REG. 359 (1999) (describing patent pools covering video compression and encryption technology).

120. 35 U.S.C. §§ 101, 103 (1952).

121. See Raskind, *supra* note 12, at 33 (forecasting further decline of subject matter boundaries).

vague on these matters.¹²² A narrow reading treats these two cases as software cases holding that there is no reason to discriminate against software merely because it has a business purpose.¹²³ Under this narrow reading, business method claims that lack a software implementation could be rejected for being outside the bounds of patentable processes. Yet, even under this narrow reading, *State Street* will have a significant economic impact because software based claims will often preempt any practical use of a business method.¹²⁴

A broad reading of these cases opens the door to patents on the full spectrum of management techniques. A software limitation on patentable subject matter might not be required because Judge Rich nowhere limited his ruling to software and he cited old business method cases predating computer technology.¹²⁵ Additionally, the language in *State Street* emphasizes there is no need for a physical transformation to make a process patentable.¹²⁶ If patentable

122. *See id.* at 62. “[T]he recent decision which announced this startling conclusion provides neither explanation, limitation, nor rationale.” *Id.* Thomas, *supra* note 72, at 25-27 (criticizing the weak arguments made by Judge Rich when he rejected the business method exception).

123. Francisco Marius Keeley-Domokos, *Intellectual Property: State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 14 BERKELEY TECH. L.J. 153 (1999). Instead, the business methods that will continue to be patented will probably involve computer software, and will also qualify as machines through proper use of means-plus-function claims.

124. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1371 (Fed. Cir. 1998), *cert. denied*, 525 U.S. 1093 (1999) (computer essential to practice method).

125. John Kasdan, *Obviousness and New Technologies*, 10 FORDHAM INTELL. PROP. MEDIA & ENTER. L.J. 159 (1999).

Since he referred to cases from as long ago as 1908 which far pre-date the computer, it is arguably the case that Rich was suggesting that even business methods which are implemented without the use of a computer should be eligible for patent protection (although it appears that, under current practice, the PTO would reject such applications).

Id.

126. *See Merges, supra* note 26, at 577 n.24.

Indeed, there is a fair argument that a business concept is patentable whether or not it is implemented on a computer: [In *State Street Bank*] the Federal Circuit indicated that whether an invention is directed to patentable subject matter under § 101 does not depend on whether a “physical” transformation takes place or whether the claim is directed to a process or a machine. From this, it might then follow that a claimed process for, e.g., performing the function similar to Signature’s invention, is patentable even absent its use with a computer. As long as the variables represent some set

processes are freed from a connection with physical apparatus, then the full range of business methods discussed in Part II may be patentable subject matter.¹²⁷ Of course, it is possible that the words “useful, tangible, and concrete” will be invoked to limit the range of business methods that are patentable.¹²⁸

Policy arguments are not much of a guide in predicting how broadly the Federal Circuit will interpret *State Street*. The policy arguments for and against expanding patentable subject matter to include business methods are not well developed. Proponents favor the broadest reach of patentable subject matter consistent with the statute and the Constitution.¹²⁹ They believe that the incentive effect created by patent property rights is desirable in any field of innovation. Opponents claim that 200 years of experience shows that

monetary values, it arguably should not matter who or what does the “transforming.” After all, regardless of the transforming mechanism (e.g., machine or human), the invention can be said to have “practical utility,” and produce a “useful, concrete and tangible result.

Id.

127. See Thomas, *supra* note 72, at 6 (“Disconnected from particular physical apparatus, such patents will set forth not so much technical artifacts, but a broad category of proprietary modes of analysis, techniques and protocols from disciplines ranging from the social sciences to the law.”).

128. See Keeley-Domokos, *supra* note 123, at 153.

The type of business methods that are likely to benefit from the *State Street* decision, however, are probably more material than just general functional operating schemes. The court in *State Street* repeatedly reiterated the utility of the invention disclosed in Signature’s patent, while concurrently emphasizing the concreteness and materiality of the result that the invention achieved. The *State Street* decision seems to indicate that to be patentable, business methods must achieve concrete and material results in addition to being useful. If this interpretation is correct, it would probably be difficult for a company to prove that a general operating business plan developed by that company deserves patent protection. To satisfy the requirements of concreteness and materiality, such a company would probably have to provide conclusive evidence that the new business method decreases operating costs, increases productivity, or achieves some other tangible economic benefit. Such an analysis would probably involve complex forecasting techniques and rely on economic assumptions and projections. The speculative nature of such endeavors probably reduces the likelihood that companies will attempt to patent general business operating methods.

Id.

129. *State Street*, 149 F.3d at 1373 (subject matter broadest possible reading because Congress did not intend any limitations); see Malla Pollock, *The Possible Unconstitutionality of Business Method Patents: Common Sense and History*, 28 RUTGERS COMPUTER & TECH. L.J. 61 (2002) (arguing that the business method patent in *State Street* violates the Patent Clause of the Constitution).

there is adequate incentive to invent new business methods even if the methods are not patentable.¹³⁰ They oppose patents because they could create market power and slow diffusion of new business methods.¹³¹ I agree with this reason for opposing patents on business methods, but it has not impressed the Federal Circuit so far.¹³²

The Court should revive the business method exception, or at least employ a narrow reading that limits business method patents to methods with a software implementation. Reviving the business method exception would return us to a world in which customer service methods get relatively little intellectual property protection.¹³³ Some administrative methods would still be eligible for patent protection and many would benefit from trade secret protection. I greatly prefer trade secret protection because most of the flood problems I described in Part IV apply to patents but not trade secrets.¹³⁴ A broad reading of *State Street* is most harmful because it

130. See Raskind, *supra* note 12, at 92-93 (discussing an adequate incentive for innovation in business methods without patent protection); Thomas, *supra* note 72, at 58 (favoring a restriction of method patents to industrial applications).

131. See Dreyfuss, *supra* note 89, at 275 (arguing the social cost of business method patents exceed the social benefits).

132. Let me take a moment to comment a little further on policy analysis of the bounds of patentable subject matter. The core trade-off in judging the social value of a patent compares the increased incentive to invent arising from the prospect of a patent to the decreased diffusion of the invention because of the exclusionary power of a patent. Proponents argue that this trade-off should be implemented on a case-by-case basis via the nonobviousness standard of § 103. They could argue that the subject matter boundary seems like a poor alternative policy instrument because the trade-off is made for a class of inventions rather than a specific invention. I would respond by claiming that cost savings justify exclusion of business methods § 101 because a *proper* nonobviousness analysis (based on the economic trade-off) would deny patents to most business method inventions. The scope of patent rights can be analyzed from other perspectives. See, e.g., F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697 (2001) (arguing that patent policy should be guided by concerns about commercializing technology).

133. Trade secret protection is unlikely because marketing methods, product features, and product varieties cannot be kept secret. Trademark and copyright law offer some protection to customer service methods. Recently, we learned that trademark law can be used to protect a method of selling Mexican food. See *Two Pesos, Inc. v. Taco Cabana, Inc.*, 505 U.S. 763 (1992). Copyright also offers limited protection to business methods. See Rinaldo Del Gallo, III, *Are "Methods of Doing Business" Finally Out of Business as a Statutory Rejection?*, 38 IDEA 403, 405 (1998). *But see* Stern, *supra* note 66, at 112-16 (discussing the limitations of copyright protection for business methods).

134. Trade secrets cannot be used to exclude competitors or slow cumulative innovation or diffusion because independent invention is allowed under trade secret law. Trade secrets do generate significant litigation and they lack the disclosure feature of patent law.

allows full patentability of customer service methods, but even a narrow reading allows patents protecting financial securities like Signature's invention.

Even if *State Street* is reversed there will still be some degree of patent protection available to business methods. The reason is that some methods useful in business have applications in technical fields as well. Some older business methods applications that were claimed as software perished on subject matter grounds because they were viewed as too abstract; but others escaped rejection on subject matter grounds. A prominent example is the linear programming algorithm invented by Karmarkar and patented by AT&T. This sort of algorithm has engineering applications, but its most profitable application for AT&T has been to management problems.¹³⁵ The engineering applications of the Karmarkar algorithm leave no doubt about patentability.

Expanded patent protection does not matter if firms choose trade secret protection in preference to patents.¹³⁶ This option is most likely for administrative method inventions.¹³⁷ Many of these methods are easy to keep secret and have a limited number of potential customers.¹³⁸ These same characteristics make patents hard to enforce.¹³⁹ Trade secret protection is also preferable for firms who are

135. AT&T sold software containing the algorithm at about \$1 million per copy to airlines that use it for scheduling flights. U.S. Patent No. 4,744,028 (issued May 10, 1988); see generally Mark Paley, *The Karmarkar Patent: Why Congress Should "Open The Door" to Algorithms as Patentable Subject Matter*, COMPUTER L. REP., Sept. 1995, at 7.

136. Jared Earl Grusd, *Internet Business Methods: What Role Does and Should Patent Law Play?*, 4 VA. J.L. & TECH. 9 (1999) (discussing the importance of trade secret protection of business methods).

137. Dell and Walmart both owe their success to innovative distribution and marketing. Dell relies mostly on patent protection of its business methods while Walmart relies on trade secret protection. See Kevin G. Rivette & David Kline, *Discovering New Value in Intellectual Property*, 78 HARV. BUS. REV. 54, 57 (2000). Firms have the strongest incentive to patent administrative methods that are broadly applicable. Relevant examples include just-in-time inventory, scheduling techniques, quality circles, the M-form of corporate organization, or the hub-and-spoke air delivery system pioneered by Fed Ex.

138. Often these methods are tailored specifically to a particular corporation; they are tailored to reflect that corporation's culture. Because the inventor is a manager in the corporation that is apt to be the only customer for the method, there is little reason to obtain a patent.

139. Infringement is especially difficult to detect when the infringing manager practices the method in her head. In the early days of software patents, commentators recognized a mental steps doctrine that would block software claims that are so abstract that they can be infringed by

concerned about imitation by competitors outside of the United States since business methods are not patentable elsewhere.¹⁴⁰ The disclosure from the patent application would disseminate the invention to foreign users. Furthermore, fear of nonobviousness invalidation might encourage trade secret protection. Secret prior art and a vast body of poorly catalogued prior art might make inventors worry about validity attacks based on prior art unavailable to the examiner. One more factor favors trade secrecy. The first inventor defense reduces the risk to trade secret owners that a later inventor will sue them as infringers.¹⁴¹ Expanding the scope of this defense to include any prior user is a desirable, if indirect, way to minimize the number of business method patents.¹⁴²

It is possible but unlikely that future floods of business method patents will be avoided by rigorous screening via the nonobviousness standard.¹⁴³ Section 103 has not presented much of a barrier in the

thought.

140. See President of the European Patent Office, Examination of “business method” applications, at www.uspto.gov/web/tws/appendix6.pdf (May 19, 2000).

Methods of doing business are, according to Article 52(2) EPC, not to be considered to be inventions. Although not explicitly stated, this exclusion is also considered to apply to a wide range of subject-matters which, while not literally methods of doing business, share the same quality of being concerned more with interpersonal, societal and financial relationships, than with the stuff of engineering—thus for example, valuation of assets, advertising, teaching, choosing among candidates for a job, etc. The term “business methods” has become a generally used shorthand for all of these areas.

Id.

141. The “First Inventor Defense Act of 1999” Subtitle C provides a defense against charges of patent infringement for a party who had, in good faith, actually reduced the subject matter to practice at least one year before the effective filing date of the patent, and commercially used the subject matter before the effective filing date. The defense is limited to methods of “doing or conducting business.” Section 273 creates a new “First Inventor Defense.” The defense is available against business method claims if the defendant acted in good faith and reduced to practice the claimed invention more than one year before the effective filing date of such patent, and commercially used the invention before the filing date.

142. See Dreyfuss, *supra* note 89, at 272 (noting the limited scope of first inventor defense); see also AIPLA White Paper, *Patenting Business Methods*, at www.aipla.org/html/whitepaper2.html (Nov. 27, 2000) (opposing special treatment of business method patents).

143. See Grusd, *supra* note 136, at 9 (“Unlike most commentators, the author will argue that the *State Street* holding does not necessarily lower the standard for obtaining patents on business methods. The *State Street* holding merely shifts the patent inquiry away from the 35 U.S.C. § 101 subject matter analysis to the novelty, utility, nonobviousness, and specification inquiries.”).

PTO to persistent e-commerce patent applicants. Patent examiners find it difficult to reject applications on obvious inventions because they lack prior art they need to document their basis for rejection.¹⁴⁴ Weak patents still might be invalidated in court but much of the harm associated with patent floods is done when the PTO issues the patents.¹⁴⁵

However, the problem lies not just with application of the obviousness test in the PTO, the standard itself is too lenient (at least as applied to business method inventions).¹⁴⁶ The increasing reliance on secondary considerations makes the obviousness hurdle too low.¹⁴⁷ Especially troubling is the use of commercial success as an indicator of nonobviousness because the nexus between commercial success and a business method invention should be quite easy to establish. Another problematic aspect of obviousness doctrine is the requirement that the examiner must show that the prior art contains a suggestion to modify old methods. I suspect that many future business method inventions will consist of melding old business methods with new technologies, or updating old methods for new

144. Formulating and Communicating Rejections under 35 U.S.C. § 103 for Applications Directed to Computer-Implemented Business Method Inventions, at www.uspto.gov/web/menu/busmethp/busmeth103rej.htm (last visited Feb. 13, 2002).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Id.; see also *In re Alappat*, 33 F.3d 1526, 1553-54 (Fed. Cir. 1994) (the dissent criticizes the majority's reasoning and suggests a danger that music CDs are now patentable as a manufacture, because they are novel, and the PTO would not be able to show obviousness).

145. The Federal Circuit expressed skepticism about the nonobviousness of one of the first e-commerce patents litigated in *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, No. 00-1109, 2001 U.S. App. LEXIS 2163, at *59-60 (Fed. Cir. Feb. 14, 2001) (“[S]ubstantial question of validity raised by the prior art references cited by BN and discussed herein.”).

146. See *Amazon.com*, No. 00-1109, 2001 U.S. App. LEXIS 2163, at *44. There is not much chance that the Federal Circuit would adopt a more rigorous standard of nonobviousness for business method patent applications because it insists the standard of nonobviousness is invariant across fields of invention.

147. The district court in the Amazon case relied on secondary considerations to support its conclusion of nonobviousness. It mentioned copying of the invention by others and solution of a long-felt unmet need. *Amazon.com*, No. 00-1109, 2001 U.S. App. LEXIS 2163, at *1366.

markets.¹⁴⁸ John Kasdan illustrates this point by citing the Priceline.com patent on an Internet version of the reverse auction method that has been around for a long time.¹⁴⁹

VII. CONCLUSION

I argue that the social cost of business method patents may be higher than other types of patents because of the problem of patent floods. Business method inventions are likely to cluster around the time that a new market opens. The cluster of inventions gives rise to a flood of patents. Patent floods create social costs that exceed the simple aggregate of the social costs associated with each patent in the flood. Those costs are attributable to increased licensing and litigation costs, an increased danger of anticompetitive exclusionary use of patents, and a stifling of refinement and application of the patented inventions.

I am particularly troubled by patents on business methods that I call customer service methods. Customer service methods relate to marketing, product features, and product varieties. In comparison to administrative methods, customer service methods are likely to cluster around the time a new market opens, and thereby create flood problems. I fear that customer service methods are especially likely to create a patent thicket that slows cumulative innovation and

148. The PTO insists there is some bite to § 103 as applied to e-commerce patents. Recent guidelines are reassuring on the point that “merely providing an automatic means to replace a manual activity which accomplishes the same result is not sufficient to” satisfy § 103. See Formulating and Communicating Rejections under 35 U.S.C. 103 for Applications Directed to Computer-Implemented Business Method Inventions, at www.uspto.gov/web/menu/busmethp/busmeth103rej.htm (last visited Feb. 13, 2002) (citing *In re Venner*, 262 F.2d 91, 95 (Pa. 1958)). The guidelines also observe “The Internet, to one ordinarily skilled in the art, for some time now is recognized as a vehicle in which information is shared from computer to computer.” *Id.* These comments seem correct, but do not really address my concerns. See William M. Bulkeley, *Fewer Patents on Methods Get Clearance*, WALL ST. J., Mar. 21, 2001, at A3 (“Critics charge that many business methods being patented are simply computerizing activities that are obvious and have been done with paper and pencil in the past.”). See Dreyfuss, *supra* note 89, at 278-79 (warning the courts not to allow patents on well known business methods just because they have a software implementation).

149. See Kasdan, *supra* note 125, at 159 (speculating that the PTO “may not have found the Priceline.com patent . . . to be obvious because, following the directives of the Federal Circuit, they were unable to find anything in the literature suggesting that it might be a good idea to computerize such transactions”).

diffusion, and institutions like patent pools may not emerge to solve these problems because of the uncertain valuation of these inventions and the heterogeneity of the inventions and patent owners. Trade secret law rather than patent law will often protect administrative methods, so making them patentable subject matter might not have significant effects.

