

Intellectual Property and Financial Markets Competition:
A Discussion of Selected Public Policy Issues

*Richard Heckinger, Victor Lubasi
and Robert S. Steigerwald*

December 12, 2007

**Intellectual Property and Financial Markets Competition:
A Discussion of Selected Public Policy Issues***

Richard Heckinger,[†] Victor Lubasi,[‡] and
Robert S. Steigerwald,[§]

Introduction

Like other sectors of the increasingly interconnected and “globalized” economy, the financial services sector has been undergoing a fundamental transformation and modernization in recent years.¹ Indeed, the pace of change in the financial services industry continues to accelerate as the industry adopts more and more advanced computing and communications technologies and as it faces increasing consolidation and competition, cross-border integration and shifts in

* This discussion draft is distributed as of December 21, 2007, for purposes of review and comment only. Please do not quote this draft without the authors’ permission.

[†] Richard Heckinger is a Senior Policy Advisor in the Financial Markets Group of the Federal Reserve Bank of Chicago. Richard.Heckinger@chi.frb.org

[‡] Victor Lubasi is a Financial Markets Senior Analyst in the Financial Markets Group of the Federal Reserve Bank of Chicago. Victor.Lubasi@chi.frb.org

[§] Robert S. Steigerwald is a Senior Financial Markets Advisor in the Financial Markets Group of the Federal Reserve Bank of Chicago. Robert.Steigerwald@chi.frb.org

¹ See, e.g., Stewart, Jamie B., “The Implications of Advancing Technology for Bankers and Central Bankers,” Remarks at SWIFT SIBOS Conference, San Francisco, California (Sept. 11, 2000):

“I cannot recall a time of more fundamental and pervasive change in the financial services industry. Much of this change – and the pace at which it is taking place – is driven by extraordinary advances in computing and telecommunications technology. These advances in technology are not just evolutionary, they are revolutionary, and they are transforming virtually every aspect of commerce and banking.”

The Society for Worldwide Interbank Financial Telecommunications, SCRL (“SWIFT”) is an industry cooperative which provides secure financial messaging services to its members. SWIFT sponsors the annual SIBOS financial services conference and exhibition.

legal and regulatory policy.² Accompanying these changes, the legal protection of intellectual property in information (e.g., account relationships, business strategies, price data, etc.), business methods or processes (e.g., accounting methods, call center operations, automated trade execution processes, etc.) and financial technologies (e.g., risk management methodologies) has become increasingly important to the industry. This paper provides an introductory discussion of the rights arising under U.S. law in these forms of intellectual property. In particular, we focus upon the role intellectual property has recently played in the competitive (but also sometimes cooperative) interaction among financial market institutions.

These institutions, which include exchanges, alternative trading systems (such as “electronic communications networks” or “ECNs”), clearinghouses and the financial intermediaries and end users which interact with them, are of particular interest because they have “network” characteristics that may be relevant to understanding how intellectual property rights affect competition in the financial services industry. To provide a basis for analyzing this question, we describe some recent intellectual property litigation involving financial markets. We then identify selected public policy issues relating to this trend, based upon a recent

² See, e.g., H. Ruding, “The transformation of the financial services industry,” Financial Stability Institute, Occasional Paper No. 2 (Basel: March 2002); A. E. Wilmarth, Jr., “The Transformation of the U.S. Financial Services Industry, 1975-2000: Competition, Consolidation, and Increased Risks,” U. of Illinois Law Rev., Vol. 2002, No. 2 (2002). The Wilmarth paper focuses upon banking and, in particular, the erosion of the separation of banking, insurance and securities underwriting under U.S. law that began sometime in the late 1970’s. See, *id.* at 219. The Ruding paper, which also focuses upon banking, emphasizes the “growing cost of technology, information and communication” costs to the financial services industry beginning in the 1980’s and 1990’s. See, *id.* at 2.

roundtable discussion sponsored by the Federal Reserve Bank of Chicago and Kellogg School of Management, Northwestern University.

Discussion

Financial market institutions, such as Chicago's derivatives exchanges and clearinghouses, have long relied upon many varieties of intellectual property, such as trademarks, copyrights and trade secrets. Until recently, however, it was uncommon for financial services competitors to seek patent protection for their innovative business methods and practices.³ In fact, intellectual property disputes among financial markets competitors were relatively infrequent until recently.⁴ Today, however, exchanges and other financial services institutions actively seek to protect their intellectual property and litigation between financial services competitors is becoming more common. The social costs of these disputes are evident; the social benefits are less obvious.

A key factor in the emerging significance of financial services-related intellectual property is the so-called "business process patent," which was formally recognized under U.S. law in 1998 with the decision of the Court of Appeals for

³ A notable early exception involved the patent issued to Reuben Jennings of Chicago in 1877 for an octagonal, recessed "trading pit." (See Appendix). The Chicago Board of Trade challenged the Jennings patent, which was later overturned by the courts. See, W. Lukken, "Patent Pending: The Role of the CFTC in Intellectual Property Disputes (Chicago: Oct. 26, 2004), available online at: <http://www.cftc.gov/opa/speeches04/opalukken-10.htm>.

⁴ The litigation in the early 1980's between the Chicago Board of Trade and Dow Jones & Co., Inc. concerning the listing of futures contracts based upon the Dow Jones Industrial Average, may have been an early indication that intellectual property-related disputes would become more common in later years. See, e.g., *Board of Trade of the City of Chicago vs. Dow Jones & Company, Inc.*, 98 Ill. 2d 109, 456 N.E.2d 84 (Ill. S.Ct.1983).

the Federal Circuit in the *State Street* case.⁵ Under *State Street*, patents may be obtained for a wide variety of financial systems and business methods, including methods for managing accounts, insurance claims, consolidating bills, asset management, electronic trading and business decision making. Patents for these and other processes, such as Amazon.com's method of conducting online commercial transactions using "one click," have routinely been granted by the U.S. Patent and Trademark Office in the years since *State Street*.

Patent disputes involving financial services – in particular, trading, clearing and settlement technologies – have become more common in the years following the *State Street* decision. For example, a patent issued in 1990 (U.S. 4,903,201) to Susan Wagner, a former official of the Commodity Futures Trading Commission, claimed the invention of an "automated futures trading exchange." The patent was later sold for an amount reported to be approximately \$2 million and became the basis of litigation in federal courts in Texas and New York. The *Chicago Board of Trade, Chicago Mercantile Exchange and New York Mercantile Exchange* settled infringement claims with the patent owner in 2002 and 2003 for an aggregate amount reported to be in excess of \$50 million.

More recently, litigation among financial markets institutions has involved a mix of intellectual property claims. For example, the *New York Mercantile Exchange* ("NYMEX") sued the *IntercontinentalExchange* ("ICE") in 2003, claiming that publicly disseminated settlement prices for contracts traded on NYMEX are

⁵ *State Street Bank and Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998).

“original works of authorship” produced by NYMEX and that ICE violated NYMEX’s registered copyright by providing facilities for trading and clearing competing contracts in the “over-the-counter” market. A federal court in New York later granted summary judgment to ICE, ruling that market prices are mere facts that cannot be copyrighted.

Pending litigation in federal court in New York and state court in Illinois involving the *International Securities Exchange* (“ISE”), *Chicago Board Options Exchange* (“CBOE”), *Dow Jones & Co.*, *McGraw-Hill* and others raises numerous intellectual property claims, including the claim that CBOE’s trading system infringes patents held by ISE (U.S. Nos. 6,618,707 6,405,180 and 6,377,940) covering the design of an “automated exchange for trading derivative securities,” etc.

Why has intellectual property become an important battleground for competition in the financial services industry? The answer to that question turns on many factors, such as the increasing importance of technology in financial services operations, the accelerated pace of financial engineering, the advent of the business process patent and, perhaps, the trend toward less prescriptive forms of financial services regulation (which may have resulted in eliminating or reducing legal barriers to competition).

Financial market institutions have responded to this change in the competitive landscape in various ways. Some patent holders have extracted rents from

competitors by threatening to enforce court orders that require parties accused of infringement to cease the activities causing infringement. Some incumbents have developed robust patent portfolios as a deterrent against the aforementioned infringement claims. Others build patent portfolios as a mechanism for negotiating licensing agreements with incumbent firms or establish standards for interoperability.

The growing prominence of intellectual property rights as a competitive factor in financial markets bears important public policy implications because of the implications for productivity, economic growth, and financial market stability. To that end, the Federal Reserve Bank of Chicago and Kellogg School of Management at Northwestern University hosted a roundtable discussion of intellectual property and competition issues relating to the financial services industry on October 29, 2007. Leading academics, legal practitioners, business leaders, and senior central bank staff explored intellectual property issues relating to financial information, business methods and technologies, and considered how conflicts over intellectual property rights have affected competition in the financial services industry.

Policymakers have explored ...“Are we striking the right balance in our protection of intellectual property rights? Are the protections sufficiently broad to encourage innovation but not so broad as to shut down follow-on innovation? Are such protections so vague that they produce uncertainties that raise risk premia and the cost of capital? How appropriate is our current system--developed for a world

in which physical assets predominated--for an economy in which value increasingly is embodied in ideas rather than tangible capital?"⁶

The answers to these questions are less than clear. Consider, for example, the Black-Scholes options pricing model and the innovations that resulted from it. Consider the impact on further innovations in finance if Fischer Black, Myron Scholes and Robert Merton patented their discovery and restricted others from using it. Suffice to say that innovations in finance and beyond could have been stifled. Merton, for example, has stated that publication of the Black-Scholes model:

“. . . provided a launching pad for refinements of the theory, extensions to derivative-security pricing in general, and a wide range of other applications, some completely outside the realm of finance. The Chicago Board Options Exchange (CBOE), the first public options exchange, began trading in April 1973, and by 1975, traders on the CBOE were using the model to both price and hedge their option positions. It was so widely used that, in those pre-personal-computer days, Texas Instruments sold a handheld calculator specially programmed to produce Black-Scholes option prices and hedge ratios.”⁷

It is unclear whether anyone at the time considered the model to be eligible for patent protection. In light of recent developments in the law, however, it seems that the model might have been considered a kind of “business method” that is routinely patented today. Landes and Posner consider the model “. . . a plausible

⁶ A. Greenspan, “Market Economies and Rule of Law,” Remarks at Financial Markets Conference, Federal Reserve Bank of Atlanta (April 4, 2003).

⁷ R. Merton, “Applications of Option-Pricing Theory: Twenty-Five Years Later,” *The American Economic Review*, Vol. 88, No. 3 (June 1998) at 324, available online at: www.jstor.org

candidate [for patent protection] had it been invented after the new type of patent [for “business-methods”] was recognized.”⁸

Whether the world of finance would have been a better or worse place had the model been patented is an important question for us to consider now that “conceptual” technologies such as mathematical methods for estimating the value of securities (so-called “Monte Carlo” simulation)⁹ and even variations on the Black-Scholes model¹⁰ have been patented. Many inventors in the financial services industry are actively seeking to protect their intellectual property and, as discussed above, litigation between financial services competitors is becoming more common. The social costs of these disputes are evident; the social benefits are less obvious.

Conclusions

The legal protection of intellectual property in information, business methods or processes and financial technologies has become increasingly important to the financial services industry in the past several decades. In particular, intellectual property has played a prominent role in recent years in the competitive (but also sometimes cooperative) interaction among financial market institutions, such as

⁸ W. Landes, and R. Posner, *The Economic Structure of Intellectual Property Law* (Cambridge, Mass.: Harvard U. Press, 2003) at 306.

⁹ See Traub, et al., U.S. Patent 5940810 (Estimation method and system for complex securities using low-discrepancy deterministic sequences), available online at: <http://www.freepatentsonline.com/5940810.html>

¹⁰ See Swift, U.S. Patent 20020178101 (System and method for option pricing using a modified Black-Scholes option pricing model), available online at: <http://www.freepatentsonline.com/20020178101.html>

exchanges, alternative trading systems, clearinghouses and the financial intermediaries and end users who interact with them. In this paper, we postulate that intellectual property has played a unique role in relation to financial market competition at least in part as a result of the “network” characteristics of the connections among these institutions.

REFERENCES

Publications

Greenspan, Alan, "Market Economies and Rule of Law," Remarks at Financial Markets Conference, Federal Reserve Bank of Atlanta (April 4, 2003), available online at:

<http://www.federalreserve.gov/boarddocs/speeches/2003/20030404/default.htm>

Landes, William M., and Richard A. Posner, *The Economic Structure of Intellectual Property Law* (Cambridge, Mass.: Harvard U. Press 2003)

Merton, Robert C., "Applications of Option-Pricing Theory: Twenty-Five Years Later," *The American Economic Review*, Vol. 88, No. 3 (June 1998) at 324, available online at: www.jstor.org

Langley, Peter, and Bob Seeman, "Patent Strategies for Financial Institutions and Internet Businesses," Paper, International Bar Association (Sept. 28, 1999), available online at: <http://www.origin.co.uk/papers/IBA.pdf>

Ruding, H. Onno, "The transformation of the financial services industry," Financial Stability Institute, Occasional Paper No. 2 (Basel: March 2002), available online at: <http://www.bis.org/fsi/fsipapers02.pdf>

Stewart, Jamie B., "The Implications of Advancing Technology for Bankers and Central Bankers," Remarks at SWIFT SIBOS Conference, San Francisco, California (Sept. 11, 2000), available online at: <http://www.newyorkfed.org/newsevents/speeches/2000/js000911.html>

Wilmarth, Arthur E., Jr., "The Transformation of the U.S. Financial Services Industry, 1975-2000: Competition, Consolidation, and Increased Risks," *U. of Illinois Law Rev.*, Vol. 2002, No. 2 (2002), available online at: <http://www.ssrn.com>

Patent Documents

Swift, U.S. Patent 20020178101 (System and method for option pricing using a modified Black-Scholes option pricing model), available online at: <http://www.freepatentsonline.com/20020178101.html>

Traub, et al., U.S. Patent 5940810 (Estimation method and system for complex securities using low-discrepancy deterministic sequences), available online at: <http://www.freepatentsonline.com/5940810.html>

SELECTED BIBLIOGRAPHY

Banks, E., *E-Finance – the Electronic Revolution* ([CITE]: John Wiley, 2001)

Bar, F., “The construction of marketplace architecture,” in *Tracking a Transformation: E-commerce and the Terms of Competition in Industries* (Washington, D.C.: Brookings Institution, 2001)

Breedon, F., and A. Holland, “Electronic versus open outcry markets: the case of the bund futures contract,” Bank of England Working Paper No. 76 (Feb. 1998), available online at: www.bankofengland.co.uk