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From a Patent Market for Lemons to a Marketplace for Patents: Benchmarking IP in Its Evolution to Asset Class Status

Ian D. McClure*

INTRODUCTION

An emphasis on strategic patent management as an independent business operation has created a sophisticated patent intermediary and services market over the past ten years, spurring an influx of patent service firms and tools which make patent research a more manageable endeavor.¹ In that same time period, intermediaries, brokers, agents, and other non-practicing entities (NPEs)—patent holding companies without operations independent of patent monetization—have entered the patent market in search of high-margin returns. The concurrent timing of both phenomena is a result of the interrelated upward swing of IP value and risk.

The value of intangible assets (of which intellectual property is a component) relative to other corporate assets has ballooned from 20% to 80% of corporate value since 1975.² Supporting the proximate accuracy of this measurement is the incredible

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¹ James Malackowski, *The Next Big Thing in Monetizing IP: A Natural Progression to Exchange-Traded Units*, LANDSLIDE, May/June 2011, at 32, 32–37 (summarizing IP intermediary market development); see also Steve Lohr, *Patent Auctions Offer Protections to Inventors*, N.Y. TIMES, Sept. 20, 2009, at B1 (stating that the IP market has experienced “[a] flurry of new companies and investment groups [looking] to buy, sell, broker, license and auction patents”).

² *Intangible Asset Market Value*, OCEAN TOMO, <http://www.oceantomo.com/2011-intangible-market-value/> (last visited Oct. 27, 2013) (“Within the last quarter century, the market value of the S&P 500 companies has deviated greatly from their book value. This ‘value gap’ indicates that physical and financial accountable assets reflected on a company’s balance sheet comprises less than 20% of the true value of the average firm. Our further research shows that a significant portion of this intangible value is represented by patented technology.”).

increase in patent filings over the same time period.³ Specifically, four times more patent applications were filed in 2012 than in 1975.⁴ This has resulted in an increased focus on IP protection, as is evidenced by the steady rise in patent litigation since 1990,⁵ capped by an unprecedented 30% increase in patent litigation filings in 2012 to reach 5000 patent suits filed in a year for the first time in history.⁶

The rise in patent litigation filings evidences increased risk to operating entities. Moreover, infringement damages awards continue to break records, and 2012 was again a benchmark year with multiple billion-dollar awards.⁷ As the demand for competent patent attorneys to enforce or defend these actions has increased, the fixed costs of patent litigation remain high.⁸ These typically unplanned expenses and potential liabilities do in fact move the needle for shareholders⁹ and can result in company downfall or, more frequently, in restricted patent filings to account for the cost.¹⁰ As a result, this author has pointed out in

³ PATENT TECH. MONITORING TEAM, U.S. PATENT & TRADEMARK OFFICE, U.S. PATENT STATISTICS CHART CALENDAR YEARS 1963–2013, [hereinafter U.S. PATENT & TRADEMARK OFFICE] available at http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.pdf (showing that utility patent application filings actually decreased year to year in 1977, 1978, 1979, 1983, 1991, 1996, 2008, and 2009, but continued their overall upward trajectory nonetheless); see also Robert Sterne & Trevor Chaplick, *Why Directors Must Take Responsibility for Intellectual Property*, INTELL. ASSET MGMT. MAG., Feb./Mar. 2005, at 16, 16–24, available at http://www.skgf.com/uploads/24/doc/Why_Directors_Must_Take_Responsibility_PDF.pdf (“The role of IP in certain industry sectors was much less prominent a decade ago. . . . Today all industry sectors embrace IP.”).

⁴ U.S. PATENT & TRADEMARK OFFICE, *supra* note 3.

⁵ Sterne & Chaplick, *supra* note 3, at 20.

⁶ PRICEWATERHOUSECOOPERS LLP, 2013 PATENT LITIGATION STUDY: BIG CASES MAKE HEADLINES, WHILE PATENT CASES PROLIFERATE 3 (2013), available at <http://pwc.to/1rMmST6>.

⁷ *Id.*

⁸ See AM. INTELLECTUAL PROP. LAW ASS'N, REPORT OF THE ECONOMIC SURVEY 2013, at 24–27 (2013); U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-13-465, INTELLECTUAL PROPERTY: ASSESSING FACTORS THAT AFFECT PATENT INFRINGEMENT LITIGATION COULD HELP IMPROVE PATENT QUALITY 26 (2013) (commenting on the cost of patent litigation and providing a helpful aggregation of research).

⁹ See NAM SANGJUN & NAM CHANGLI, THE IMPACT OF PATENT LITIGATION ON SHAREHOLDER VALUE IN THE IT INDUSTRY 4–5 (2012), available at <http://econstor.eu/bitstream/10419/72514/1/742699536.pdf> (“Bhagat, Bizjak and Coles (1998), using an event study, showed that the wealth effect of patent litigation is negative for defendant firms and insignificant for plaintiff firms. Lerner (1995) investigated the wealth effect of patent litigation on biotechnology firms and found a negative effect on stock prices. Bessen and Meurer (2007) examined the negative impact of a patent lawsuit on shareholder value using a large sample based on the date of the filing of the lawsuit for US public firms from 1984 to 1999. The results showed that the patent litigation filing announcement has a negative effect on defendant firms, after controlling certain factors pertaining to firm characteristics.”).

¹⁰ See *Abusive Patent Litigation: The Impact on American Innovation & Jobs, and Potential Solutions: Hearing on H.R. 845 Before the H. Comm. on the Judiciary*, 113th Cong. 11 (2013) [hereinafter *Hearing on Abusive Patent Litigation*] (statement of Mark Chandler, Senior Vice President and General Counsel, Cisco Systems Inc.).

a separate article that reasonable arguments exist that the responsibility for managing this risk should go to the level responsible for guarding shareholder value: the board of directors.¹¹ In any case, the rise in risk, value, and cost has created a perfect storm for successful exploitation by NPEs and other investors.

The rise in patent value and risk has been evidenced through the transaction market as well. Compared with two decades ago, private patent transactions continue to increase in volume and evolve in sophistication.¹² This Article will detail particularly noteworthy transactions that provide perspective for this market evolution. The point of emphasis for the purposes of this Article, however, is that despite growth in the patent transaction market, it remains a private transaction market today.¹³ This circumstance, coupled with the current litigation environment, provides advantages for certain types of NPEs and investors looking to deal in a particularly low-quality brand of patent.¹⁴ This consequence will be discussed in more detail later.

The recent developments in the IP market track a familiar course charted by other asset classes through their recognition,

¹¹ Ian D. McClure, *Accountability in the Patent Market: A Duty to Monitor Patent Risk from the Boardroom*, 31 SANTA CLARA HIGH TECH. L.J. (forthcoming May 2015) (on file with author).

¹² See WORLD INTELLECTUAL PROP. ORG. (WIPO), INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) STRATEGY 5 (2013) (“For instance, demand for patents increased across the world from around 800,000 patent applications in the early 1980s to 1.8 million by 2009, with the greatest increase in demand occurring as of the mid-1990s. Trademark applications show a similar evolution due to an increased emphasis on brand distinction in both domestic and global markets. These trends are likely to continue for the foreseeable future.”).

¹³ See Ian McClure, *A Market-Based Alternative to Patent System Challenges*, WIPO MAG., Feb. 2014, at 23, 23 available at http://www.wipo.int/export/sites/www/wipo_magazine/en/pdf/2014/wipo_pub_121_2014_01.pdf (“Over the last decade, the market for patents has flourished. Patent intermediaries, brokers and other agents have developed a liquidity pool for patents and patent rights, including license rights, covenants not to sue and other hybrids. These products are marketed, sold, purchased, bartered, exchanged, traded, consorted, leased and disposed of just like other assets, goods or properties. However, unlike many other markets, the nascent market for patent rights is composed solely of private, bilateral dealings. In many respects, the market as it exists today operates in a rogue environment. There is little or no transparency of market information or means of identifying market behavior. The only mechanism for regulating this emerging market is through the courts, where predictability is difficult and barriers to entry – high legal costs – create the conditions for certain parties to exploit such uncertainty.”).

¹⁴ See, e.g., David Kravets, *History Will Remember Obama as the Great Slayer of Patent Trolls*, WIRED (Mar. 20, 2014, 6:30 AM), <http://www.wired.com/2014/03/obama-legacy-patent-trolls> (“Often taking advantage of vague patent claims and a legal system slanted in the plaintiff’s favor, the company uses the patents to sue or threaten to sue other companies, with an eye to settling out of court for a fraction of what they were originally seeking.”).

development, and maturation.¹⁵ This Article will discuss this course and the basic steps involved in the evolution of an asset class. In particular, it will argue that the role of NPEs and “patent trolls” has been an essential evolutionary step in the progression of patent rights as an asset class and an article of trade. For the first time, speculators are participating in the patent market with only a monetary return as their objective. Without regard for the ethics or merits of particular activities or their impact on innovation, this circumstance has served as an exercise in educating the IP world about speculation, liquidity, valuation, and efficient asset management. In the absence of a central marketplace, third-party entities and syndicates such as RPX Corp., Allied Security Trust, LOT Network, and Intellectual Ventures act as agents on behalf of market participants to provide access, anonymity, and collective network effects in the market.¹⁶ This Article will point out that, in accordance with indicia related to the growth of other asset classes, these market participants should next look to build interoperability protocols (“best practices”), course of dealing standards, and mechanisms to provide greater transparency, all of which may be exercisable through a central marketplace.

This Article proceeds in three parts. Part I will explore the historical development of other asset classes in order to see what their evolutionary patterns can actually tell us about the roadmap for intellectual property as the next asset class. Specifically, the evolution of commodities and equities are studied. This will demonstrate that, notwithstanding the current “patent market for lemons” (its exploitation by non-practicing entity speculators and its perceived impact on innovation and the economy), there is a different vantage point from which it is clear that this phenomenon is a necessary step in the development of a new tradable asset class—intellectual property.¹⁷ Indeed, authors Mark Blaxill and Ralph Eckardt suggest that the development of nearly every asset class includes the evolutionary steps of: (1) a low volume of private transactions executed without transparency and involving assets not easily valued; (2) increased recognition of asset value and increased transaction activity due to third-party service providers, intermediaries, and

¹⁵ MARK BLAXILL & RALPH ECKARDT, *THE INVISIBLE EDGE: TAKING YOUR STRATEGY TO THE NEXT LEVEL USING INTELLECTUAL PROPERTY* 272–74 (2009).

¹⁶ RPX, <http://www.rpxcorp.com> (last visited May 18, 2015); ALLIED SECURITY TRUST, <http://www.alliedsecuritytrust.com> (last visited May 18, 2015); LOTNET, <http://www.lotnet.com/lotnet-solution/index.cfm> (last visited May 18, 2015); INTELLECTUAL VENTURES, <http://www.intellectualventures.com> (last visited May 18, 2015).

¹⁷ See generally George A. Akerlof, *The Market for Lemons: Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488 (1970).

specialists; (3) an influx of speculators to develop liquidity; (4) development of a marketplace for exchange to create transparency, pricing mechanisms, and greater transaction efficiencies; and (5) development of derivatives and other instruments for hedging risk and investment.¹⁸

Part II will take this pattern and hold it up to the evolution of the patent transactions market. It will explain that an understanding of the current patent market, and specifically market behavior which has caused an explosion of patent filings and litigation, requires first an understanding of phenomena shaping the market which are based in law and economics: (1) corporate value has inversed from traditionally tangible assets to newly recognized and managed intangible assets; (2) due to patent system challenges exacerbated by increased filings and limited patent office resources, patent rights are inherently probabilistic rights with increased uncertainties; (3) the patent market is primarily a private bilateral market with rogue actors and without information transparency or reliable quality and price benchmarks; and (4) as a result of (1)–(3), the patent market has become a “market for lemons,”¹⁹ where asymmetries of information and a favorable litigation environment are being exploited to extort value from low-quality assets, constraining the overall size of the market as a result. Due to the rise in patent value and risk, and the challenges of information discovery, new third-party specialists and intermediaries have entered the market to help fill the information gap. Finally, speculators have now emerged, utilizing the new information tools and resources available to profit from the trade of patent rights.

Part III will benchmark intellectual property along the evolutionary path to asset class status. Specifically, it will conclude that speculative activity in the current “patent market for lemons” represents that we are at step three out of five, or rather, that NPEs are speculators helping to raise the awareness of patent rights as an asset class and article of trade. As a result, this Article will identify critical next steps to complete this evolutionary process. Specifically, the next step is the development of marketplaces that (1) reduce the effectiveness of

¹⁸ BLAXILL & ECKARDT, *supra* note 15, at 268–80. Blaxill and Eckardt suggest that six stages define the evolution of an asset class. This author believes, however, that the fourth stage they identify—the decline of transaction costs—is simply a long-developing product of: (1) specialists entering the market; (2) speculators entering the market; and (3) marketplaces for exchange developing. This results in only five real evolutionary stages.

¹⁹ Akerlof, *supra* note 17.

rogue activities that produce an environment that may be exploited by such NPEs to other market participants' disadvantage and (2) increase the transparency, pricing mechanisms, and volume of patent transactions with reduced transaction costs. Standards in patent quality and course of dealing are necessary, and once these marketplaces for exchange are effectively operating, the development of derivatives for patents will solidify it as the next asset class.

I. EVOLUTION OF AN ASSET CLASS

An "asset class" is commonly defined as "[a] group of securities that exhibit similar [financial] characteristics, behave similarly in the marketplace, and are subject to the same laws and regulations."²⁰ Some people identify different investment instruments or assets as "asset classes," and there is not always agreement on the identification of the major asset classes.²¹ It seems that the most widely agreed upon asset classes today include equity, bonds, cash instruments or currency, real estate, and commodities.²² The most common variation in the identification of an asset class is the mislabeling of an asset class *category*, such as small-cap stocks or high-yield bonds, as an "asset class."²³

This Article purports to show that each of the major asset classes has experienced a common evolution—a path with similar "stages"—on its way to becoming an asset class (that is, a group of securities having similar financial characteristics, behaving similarly in the marketplace, and becoming subject to the same laws and regulations). Blaxill and Eckardt developed this idea by suggesting that asset markets go through six sequential stages

²⁰ *Asset Class*, INVESTOPEDIA, <http://www.investopedia.com/terms/a/assetclasses.asp> (last visited May 18, 2015).

²¹ Emily Hall, *Do You Own Enough Asset Classes?: How to Diversify Your Portfolio Among Stocks, Bonds, and Cash*, MORNINGSTAR (Feb. 25, 2004, 6:00 AM), <http://news.morningstar.com/articlenet/pfarticle.aspx?id=104364&> ("Some people think that asset classes are stocks, bonds, commodities, real estate, etc. Many people also include cap size, foreign, domestic, etc. under the definition of asset class.")

²² See Charles Rotblut, *Asset Classes Defined*, AM. ASS'N INDIVIDUAL INVESTORS (July 2010), <http://www.aaii.com/journal/article/asset-classes-defined>; see also *Asset Classes Explained*, BLACKROCK, <https://www.blackrock.com/uk/individual/resources/investment-guides/understanding-investments/asset-classes-explained> (last visited Feb. 10, 2015) (identifying equities, bonds, and cash as the three major asset classes). But see BRINKER CAPITAL, HELPING YOU INVEST WITH CONFIDENCE (2014), available at http://clients0.brinkercapital.com/wp-content/uploads/2014/09/BRO_INVEST_SLTN.pdf (identifying domestic equity, international equity, fixed income, absolute return, real assets, and private equity as the major asset classes); *Infrastructure as an Asset Class*, UBS, https://www.ubs.com/global/en/asset_management/infrastructure-and-private-equity/about_iaf.html (last modified Jan. 19, 2012) (identifying infrastructure as an asset class comparable to other major asset classes in investment performance).

²³ Hall, *supra* note 21.

on their way to becoming exchange-tradable asset classes, with derivatives and other product innovation further driving the market's growth. These stages occur as follows: (1) assets are closely held and thinly traded; (2) specialists emerge to facilitate transactions; (3) speculators enter the market; (4) transaction costs decline; (5) marketplaces for exchange are established; and (6) derivatives emerge.²⁴ For the purpose of this Article, the fourth stage—the decline of transaction costs—will not be addressed, because this author views it as a long-developing product of stages (1), (2), and (3), rather than a separate evolutionary stage. Blaxill and Eckardt offered minimal support or historical accounting to demonstrate that each of these stages did, in fact, occur sequentially for every major asset class.²⁵ In this light, this author has found very little academic pursuit on the topic of one sequential path being taken to asset class status. Without this support and verification, it would be impossible to draw a parallel to intellectual property or benchmark its current life cycle relative to asset class status.

By researching the history of the development of each asset market, this Article verifies that the five stages identified did occur sequentially for at least two of the major asset classes—equities and commodities.²⁶ An accounting of these stages for each asset market follows.

A. Development of Equities as an Asset Class

1. Closely-Held and Thinly-Traded Assets

For most major asset classes, the stages of evolution took place centuries ago—this is true for equities. For the purposes of this Article, equity is defined as corporate stock or a security that signifies ownership in a corporation and represents a claim on part of the corporation's assets and earnings.²⁷

The significance of corporate entities began during the Roman Empire. In the early sixth century, Roman law recognized various types of municipal-led, political or religious-focused

²⁴ BLAXILL & ECKARDT, *supra* note 15, at 269–79.

²⁵ *Id.* Blaxill and Eckardt note various examples of certain asset classes for each of the stages, but fall short of demonstrating that each asset class followed a common path from stage one to stage six. The latter is what this author seeks to show, which will allow a more accurate benchmarking of the evolution of intellectual property.

²⁶ For the purposes of this Article, research was confined to these two asset classes and did not attempt to verify the stages for real estate, currency, or bonds.

²⁷ See Investopedia Staff, *Stock Basics: What Are Stocks?*, INVESTOPEDIA, <http://www.investopedia.com/university/stocks/stocks1.asp> (last visited May 18, 2015).

corporations under the names *universitas*, *corpus*, or *collegium*.²⁸ The alleged oldest commercial corporation in the world, the Stora Kopparberg mining community in Falun, Sweden, obtained a charter from King Magnus Eriksson in 1347.²⁹ However, Stora is credited with its first memorialized stock transfer in 1288, when shares worth 12.5% of the company were transferred to Bishop Peter of Västerås in exchange for an estate.³⁰ Until the 1600s, however, there is scant evidence of public investment opportunities related to corporations. As Blaxill and Eckardt point out, “[c]ompany stock and debt was once held exclusively by owner-managers.”³¹ In Rome, there is some evidence that certain firms, called *publicani*, were granted government contracts and became successful permanent companies with numerous non-manager investors reaching corporate status, including limited liability for the investors.³² In general, until the 1600s, corporate ownership was held by managing-members of the companies, and there was little speculative investment opportunity for this closely held equity.

2. Specialists and Intermediaries Emerge to Facilitate Transactions

As investment in private opportunities became important to wealthy individuals in the eleventh and twelfth centuries,³³ there was a gap to be filled in linking those individuals with money and those presenting investment opportunities. Beginning in the 1200s, private brokers and moneylenders began to fill gaps that could not be filled by banks in facilitating investment in private opportunities, such as voyages. Brokers met private investors in London coffee shops to propose the development of voyages and other opportunities and explain the need for financing these

²⁸ 1 HAROLD J. BERMAN, *LAW AND REVOLUTION: THE FORMATION OF THE WESTERN LEGAL TRADITION* 215–16 (1983), available at http://aprender.ead.unb.br/pluginfile.php/904/course/section/1077/%5BHarold_J._Berman%5D_Law_and_Revolution,_The_Formati%28Bookos.org%29.pdf.

²⁹ BARINE A. KIRIMI & DAVID MINJA, *TRANSFORMATIONAL CORPORATE LEADERSHIP* 22 (2012).

³⁰ Kim Gittleson, *Can a Company Live Forever?*, BBC NEWS (Jan. 19, 2012, 3:24 PM), <http://www.bbc.co.uk/news/business-16611040>; Joanne Mason, *700-Year-Old Swedish Timber Company Is Still Going Strong by Branching Out*, L.A. TIMES (June 7, 1988), http://articles.latimes.com/1988-06-07/business/fi-3731_1_swedish-match.

³¹ BLAXILL & ECKARDT, *supra* note 15, at 270.

³² H.H. SCULLARD, *A HISTORY OF THE ROMAN WORLD: 753 TO 146 BC*, at 319 (4th ed. 1980); Ulrike Malmendier, *Roman Shares*, in *THE ORIGINS OF VALUE: THE FINANCIAL INNOVATIONS THAT CREATED MODERN CAPITAL MARKETS* 31, 32–33 (William N. Goetzmann & K. Geert Rouwenhorst eds., 2005).

³³ PAOLO MALANIMA, *PRE-MODERN EUROPEAN ECONOMY: ONE THOUSAND YEARS (10TH–19TH CENTURIES)* 327–28 (Maarten Prak & Jan Luiten van Zanden eds., Brill, Global Economic History Ser. Vol. 5, 2009).

endeavors.³⁴ These individuals and firms also acted as consultants and investment advisors, providing advisory services to private investors on one hand and capital-raising services to companies on the other.³⁵ Without these brokers, investors would not have had awareness of investment opportunities or a sense of their worth.

In the 1300s, the Venetians led a burgeoning brokerage industry by trading debt securities from other governments.³⁶ Brokers carrying slates with information on the various issuances of government and private debt for sale would attend marketplaces and public commons and meet with clients to transact.³⁷ In Antwerp, Belgium, in the 1500s, brokers and moneylenders would meet at a public securities exchange to trade in business, government, and even individual debt issuances.³⁸ While these investment and broker services did not typically trade in equities, it began a period of specialization in third-party investment and brokerage services that would effectively lead to the development of the next generation of public equities trading. These intermediaries facilitated greater awareness of investments and measurement of their quality.

3. Speculators Enter the Market

For years, in order to lessen the risk of voyage disaster due to weather or Barbary pirates, ship owners had sought investors who would put up money for voyages—outfitting a ship and crew in return for a percentage of the proceeds if a voyage was successful.³⁹ These early limited liability companies often lasted for only a single voyage; they were dissolved, and a new company was created for the next voyage.⁴⁰ Investors spread their risk by

³⁴ *Id.*; JOHN BIDDULPH MARTIN, “THE GRASSHOPPER” IN LOMBARD STREET 181 (London, Leadenhall Press, Ltd. 1892), available at <https://archive.org/details/grasshopperinfo00martgoog>; John D. Pelzer, *The Coffee Houses of Augustan London*, HIST. TODAY, Oct. 1982, at 40, 40–47, available at <http://www.historytoday.com/john-d-pelzer/coffee-houses-augustan-london>.

³⁵ Pelzer, *supra* note 34.

³⁶ Bryan Taylor, *Birds, Boats and Bonds in Venice: The First AAA Government Issue*, GLOBAL FIN. DATA, <https://www.globalfinancialdata.com/gfdblog/?p=1818> (last visited May 18, 2015).

³⁷ Peter Spufford, *The Provision of Stable Moneys by Florence and Venice, and North Italian Financial Innovations in the Renaissance Period*, in EXPLAINING MONETARY AND FINANCIAL INNOVATION 227, 227–51 (Peter Bernholz & Roland Vaubel eds., Springer, Financial and Monetary Policy Studies Ser. Vol. 39, 2014).

³⁸ Markus A. Denzel, *Monetary and Financial Innovations in Flanders, Antwerp, London and Hamburg: Fifteenth to Eighteenth Century*, in EXPLAINING MONETARY AND FINANCIAL INNOVATION, *supra* note 37, at 253, 258.

³⁹ *Id.*

⁴⁰ *Id.*

investing in several different ventures at the same time, thereby playing the odds against all of them ending in disaster.⁴¹

In the 1600s, the Dutch, British, French, Danish, and Portuguese governments all gave charters to companies with East India in their names.⁴² England was first, chartering the East India Company on December 31, 1600.⁴³ The British East India Company pioneered the first joint ownership of stock, but at first joint stocks were created for each voyage, limiting the ability to mitigate risk by spreading investment across all voyages.⁴⁴ By 1657, the company was formalized as a “continuous unlimited investment taking place without reference to individual voyages.”⁴⁵ The Dutch East India Company (the Vereenigde Oost-Indische Compagnie, or VOC) is credited with being the first publicly traded company by offering the first self-issuance of publicly negotiable stock, allowing investment risk to be spread across all of its ships’ voyages in a regulated market environment.⁴⁶ The success of the East India companies drove other publicly tradable companies to the market as well. Some of these had government charters, such as the English South Sea Company, and others were less official.⁴⁷

The result of new equity investment opportunities was the emergence of new speculation. Financial speculation had already been active in Antwerp and Lyons involving government debts and other securities, but after Lyons’ markets died when King Henry II of France suspended payments on his debts in 1557 and Antwerp was sacked by Spanish troops in 1585, speculation activity shifted to London and Amsterdam following the emergence of tradable equities in the East India Companies.⁴⁸ Soon, capital from investors all over Europe was being invested in East India equities, among other financial assets, in

⁴¹ *Id.* at 254, 276.

⁴² *East India Company*, WIKIPEDIA, http://en.wikipedia.org/wiki/East_India_Company (last visited May 18, 2015).

⁴³ Rob Wile, *Bailouts, Bribes and Insider Trading: Here’s What the World’s Leading Business Looked Like 300 Years Ago*, BUSINESS INSIDER (Feb. 21, 2012, 12:26 PM), <http://www.businessinsider.com/history-of-british-east-india-company-2013-4>.

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ Clem Chambers, *Who Needs Stock Exchanges?*, MONDOVISIONE (July 14, 2006), <http://www.mondovisione.com/exchanges/handbook-articles/who-needs-stock-exchanges/>; see also EDWARD CHANCELLOR, *DEVIL TAKE THE HINDMOST: A HISTORY OF FINANCIAL SPECULATION* 9 (2000) (“Although the Dutch did not invent the institutions and practices of financial capitalism such as banking, double-entry bookkeeping, joint-stock companies, bills of exchange, and stock markets, they brought together and established them on a secure basis in a mercantile economy organised around a highly evolved profit motive.”).

⁴⁷ RICHARD DALE, *THE FIRST CRASH: LESSONS FROM THE SOUTH SEA BUBBLE* 40 (2004).

⁴⁸ CHANCELLOR, *supra* note 46, at 8–9.

Amsterdam and London.⁴⁹ Speculation in these markets hit an all-time high in the early 1700s during the “South Sea Bubble,” prior to the creation of a regulated stock exchange in London.⁵⁰ During this period, investors poured into coffee shops to throw money at things as wild as “a company for carrying out an undertaking of great advantage, but nobody to know what it is.”⁵¹

Speculative zeal had risen steadily in the English breast during the preceding 30 years, the childhood of the London Stock Exchange. A gargantuan Mississippi Bubble had expanded in France. Cupidity was not unknown in Holland. From September 1719 through August 1720, 190 English speculative ventures had their initial public offerings. Some were honest, many not.⁵²

4. Marketplaces for Exchange Are Developed

The new speculative activity around equities led to the development of the first stock exchange in 1602, commencing with the issuance of stock in the Dutch East India Company.⁵³ Finding real secondary market volume and liquidity by the 1630s, the Amsterdam exchange was home to the first market-making activity through the buying and selling of VOC shares on demand.⁵⁴ The real evolution of stock exchanges, however, followed in 1698 when London stock broker John Castaing began to post a list of stock and commodity prices called “The Course of the Exchange and other things” at Jonathon’s Coffee House after stock brokers were banned from the Royal Exchange for their manners.⁵⁵ According to the London Stock Exchange (LSE) today, this was “the earliest evidence of organised trading in marketable securities in London.”⁵⁶ In 1773, a group of 150 brokers erected “The Stock Exchange” at Jonathon’s, in 1801 it took on a membership subscription structure, and in 1812 the first codified rule book was formed.⁵⁷ Nineteen years after the creation of “The Stock Exchange” in

⁴⁹ *Id.* at 9–10.

⁵⁰ *Our History*, LONDON STOCK EXCHANGE, <http://www.londonstockexchange.com/about-the-exchange/company-overview/our-history/our-history.htm> (last visited Feb. 11, 2015) [hereinafter LONDON STOCK EXCHANGE].

⁵¹ *The Financial System: What Went Wrong*, ECONOMIST (Mar. 19, 2008), <http://www.economist.com/node/10881318>.

⁵² Christopher Reed, “*The Damn’d South Sea*,” HARV. MAG., May–June 1999, at 36, 40, available at <https://harvardmagazine.com/1999/05/damnd.html>.

⁵³ *Dutch Fleet: The Home of the World’s First Stock Exchange Is Now a High-Frequency Heartland*, ECONOMIST (Apr. 20, 2013), <http://www.economist.com/news/finance-and-economics/21576423-home-worlds-first-stock-exchange-now-high-frequency-heartland-dutch>.

⁵⁴ *Id.*

⁵⁵ LONDON STOCK EXCHANGE, *supra* note 50.

⁵⁶ *Id.*

⁵⁷ *Id.*

London, the New York Stock Exchange (NYSE), formed by brokers under a buttonwood tree, made its home on Wall Street.⁵⁸ The NYSE would enjoy little competition in the United States until the birth of the NASDAQ in 1971.⁵⁹ Although London emerged as the major European exchange, many companies that were capable of listing internationally still listed on the NYSE.⁶⁰ “Many other countries including Germany, France, the Netherlands, Switzerland, South Africa, Hong Kong, Japan, Australia and Canada developed their own stock exchanges, but these were largely seen as proving grounds for domestic companies to inhabit until they were ready to make the leap to the LSE and from there to the big leagues of the NYSE.”⁶¹ These exchanges provided regulation, access, liquidity, and price discovery mechanisms not readily available prior to the early seventeenth century.

5. Development of Derivatives

Some academics have suggested that derivatives were not developed until the twenty-first century, or even in the last twenty-five years.⁶² Early evidence of equities derivatives is sparse, which is likely a result of their over-the-counter nature and association with privately dealt margin loans and short sale transactions.⁶³ Nevertheless, some historians have found enough evidence to tag their development to the early seventeenth century. The development of the Amsterdam exchange brought on the first derivative products for both commodities and equities. An accounting by Edward Chancellor of these events provides an excellent summary:

In the early seventeenth century, [derivatives] became available in the *actions* (shares) of the East India Company. Speculators could also take out loans on shares at up to four-fifths of their market value

⁵⁸ Ellen Terrell, *History of the New York Stock Exchange*, LIBR. CONGRESS, http://www.loc.gov/rr/business/hottopic/stock_market.html (last updated Oct. 2012).

⁵⁹ Ellen Terrell, *History of the American and NASDAQ Stock Exchanges*, LIBR. CONGRESS, <http://www.loc.gov/rr/business/amex/amex.html> (last updated Oct. 2012).

⁶⁰ Andrew Beattie, *The Birth of Stock Exchanges*, INVESTOPEDIA, <http://www.investopedia.com/articles/07/stock-exchange-history.asp> (last visited Feb. 13, 2015).

⁶¹ *Id.*

⁶² Ernst Juerg Weber, *A Short History of Derivative Security Markets 1* (Univ. of W. Austl., Economic Discussion Paper No. 08.10, 2008), available at http://www.uwa.edu.au/_data/assets/pdf_file/0003/94260/08_10_Weber.pdf; see also JOHN C. HULL, *OPTIONS, FUTURES, AND OTHER DERIVATIVES 1* (7th ed. 2008) (“In the last 30 years derivatives have become increasingly important in finance. Futures and options are now traded actively on many exchanges throughout the world.”).

⁶³ Weber, *supra* note 62, at 2 (“The history of derivatives has remained unexplored because there are few historical records of derivative dealings. Derivatives left no paper trail because they are private agreements that have been traded in over-the-counter markets for most of their history.”).

(what Americans later called “margin loans”). Stock options—which gave the buyer the right, but unlike the futures contract not the obligation, to buy or sell shares at a fixed price during the contract period—were also traded on the Exchange. Later in the century, *ducaton* shares in the East India Company were introduced; valued at a tenth of the highly priced ordinary shares, they enabled less wealthy speculators to play the market. Futures, options, and *ducaton* shares are all examples of what we call derivatives, namely financial contracts which *derive* their value from an underlying asset, such as a share. Together with stock loans, they created the opportunity for financial leverage, so that small rises in share prices brought larger percentage gains to speculators (with small price declines producing the opposite effect).⁶⁴

Similarly, Ernst Weber provides another account linking early seventeenth century Amsterdam to the first stable bourse for derivatives trading:

Right from the beginning [of the issuance of East India Company shares], share trading involved contracts for differences. In an essay on the speculative activities of Isaac Le Maire (1558–1624), van Dillen noted that shares were traded “on term” (for future delivery): “[S]hares sold not only for cash but also on term. This wasn’t anything new in Amsterdam, since term sales had been the custom for trade in wheat and herring.” He also found that forward contracts on shares were usually settled as contracts for differences: “Instead of delivering the shares, people were content most often to pay the surplus, the difference between trading rates, which had to be settled later.” Amsterdam was the first city where derivatives that were based on securities were used freely for a long period of time.⁶⁵

Therefore, it is clear that the emergence of more regulated trading and a central marketplace for price discovery and other market facilities gave birth to a steady environment for new speculative activity in the form of derivative contracts for equities.

B. Development of Commodities as an Asset Class

1. Closely-Held and Thinly-Traded Assets

Similar to equities, the evolution of commodities as an article of trade occurred over centuries, but the time from specialists emerging to the development of derivatives was less than one hundred years. Indeed, the exchange of commodities may have

⁶⁴ CHANCELLOR, *supra* note 46, at 10.

⁶⁵ Weber, *supra* note 62, at 13 (citations omitted) (quoting J.G. van Dillen, Geoffrey Poitras & Asha Majithia, *Isaac Le Maire and the Early Trading in Dutch East India Company Shares*, in 1 PIONEERS OF FINANCIAL ECONOMICS 45, 53–58 (Geoffrey Poitras ed., 2006), available at http://www.sfu.ca/~poitras/ch2_lemaire.pdf).

begun over 150,000 years ago.⁶⁶ For the purposes of this Article, a commodity is defined as a raw material or primary agricultural product that can be bought and sold, from hard commodities like metals and oil to soft commodities like agriculture and livestock.⁶⁷

Obsidian and lapis lazuli are two minerals that have the longest trade history. Obsidian originated in the southwest of Asia⁶⁸ and traded in early markets in Guinea from 17,000 BC onward. Lapis lazuli originated in the Sar-i Sang mines of Afghanistan⁶⁹ and traded in the markets of Babylonia during the Kassite period, circa 1595 BC.⁷⁰ Long-range trade routes first appeared in the third millennium BC between the Harappan civilization and the Sumerians.⁷¹ The Phoenicians were also noted sea traders, traversing the Mediterranean and creating enclaves for trading centers in various ports as they went,⁷² known to the Greeks as *emporía*.⁷³

Financially lucrative trade brought valuable commodities from across regions. While the concept of free trade was still inapposite to some cultures during this period, stable and secure transportation networks to enable the transfer of goods without fear of piracy remained of paramount importance until the fall of the Roman Empire in the fifth century.⁷⁴ While the fall of the Roman Empire and the succeeding Dark Ages brought instability to trade networks in the Western World, markets in Africa, the Middle East, India, China, and Southeast Asia continued to flourish.⁷⁵ Continuing through to the Middle Ages, Central Asia became the economic center of the world, with the Silk Road

⁶⁶ See PETER WATSON, *IDEAS: A HISTORY OF THOUGHT AND INVENTION, FROM FIRE TO FREUD* 71 (2005).

⁶⁷ See *Commodity*, BLACK'S LAW DICTIONARY 331 (10th ed. 2014); see also Joshua Kennon, *What Are Commodities*, ABOUT MONEY, <http://beginnersinvest.about.com/cs/commodities/f/whatcommodities.htm> (last visited Feb. 13, 2015).

⁶⁸ RICHARD L. SMITH, *PREMODERN TRADE IN WORLD HISTORY* 19–20 (2009).

⁶⁹ TOBY A. H. WILKINSON, *EARLY DYNASTIC EGYPT* 164 (2001); DOMINIQUE COLLON, *INTERPRETING THE PAST: NEAR EASTERN SEALS* 32 (1990).

⁷⁰ GWENDOLYN LEICK, *THE BABYLONIAN WORLD* 520 (2007).

⁷¹ See 3 MARSHALL CAVENDISH CORP., *WORLD AND ITS PEOPLES: MIDDLE EAST, WESTERN ASIA, AND NORTHERN AFRICA* 312 (2007).

⁷² See *CITIES OF THE MIDDLE EAST AND NORTH AFRICA: A HISTORICAL ENCYCLOPEDIA* 104–05 (Michael R.T. Dumper & Bruce E. Stanley eds., 2007).

⁷³ JOHANNES HASEBROEK, *TRADE AND POLITICS IN ANCIENT GREECE* 107 (L.M. Fraser & D.C. Macgregor trans., 1933).

⁷⁴ See generally *id.* at 46–55.

⁷⁵ See *Golden Age of West Africa*, STUDENTS' HISTORY, <http://dgh.wikispaces.com/Golden+Age+of+West+Africa?> (last updated May 16, 2014); A.G. HOPKINS, *AN ECONOMIC HISTORY OF WEST AFRICA* 80 (1973) (“The period which corresponds to the Middle Ages in European history was a flourishing time for trade on the Saharan routes . . .”).

acting as the main trade route from the fifth to eighth century.⁷⁶ From the eighth to eleventh century, Vikings traded as they sailed to Western Europe and Varangians traded as they sailed from Scandinavia to Russia.⁷⁷

During these periods, the trade of commodities was largely based on real need for other goods and for the actual transport and supply of those goods to ports and city marketplaces. There was little investment opportunity, and supply was not always predictable. To build predictability in supply, the thirteenth century brought with it the first alliances of trading cities. For example, the Hanseatic League maintained a trade monopoly over most of Northern Europe and the Baltics from the thirteenth to seventeenth century.⁷⁸ In the sixteenth century, the “Seventeen Provinces” of the Dutch Republic became the centers of *free* trade, imposing no exchange controls and advocating for the free movement of goods.⁷⁹ Despite these new “efficiencies,” trading remained sporadic and was primarily farmer-to-farmer or farmer-to-merchant, which caused access, delivery, and predictability problems.

2. Specialists and Intermediaries Emerge to Facilitate Transactions

Merchants who acted as early intermediaries in commodities markets frequently looked for ways to improve the relay of information on crop availability.⁸⁰ Merchants could act on behalf of farmers and provide value with their knowledge of buyers who regularly came to the market in previous seasons. However, it wasn't until the nineteenth century that commodities markets saw an influx of specialists and intermediaries to help facilitate transactions. Two major inventions of the nineteenth century, the telegraph and the steamship, “changed the price formation process [for commodities] by taking into account, for the first

⁷⁶ HOPKINS, *supra* note 75; see *Silk Road*, WIKIPEDIA, http://en.wikipedia.org/wiki/Silk_Road (last visited May 18, 2015); *Sogdian Trade*, ENCYCLOPÆDIA IRANICA, <http://www.iranicaonline.org/articles/sogdian-trade> (last visited May 18, 2015).

⁷⁷ See 1 CANDICE GOUCHER & LINDA WALTON, *WORLD HISTORY: JOURNEYS FROM PAST TO PRESENT* 290–91 (2d ed. 2013).

⁷⁸ *Id.* at 174, 557.

⁷⁹ See Bruce Bartlett, *The Truth About Trade in History*, in *FREEDOM TO TRADE: REFUTING THE NEW PROTECTIONISM* 9, 10–11 (Edward L. Hudgins ed., 1997).

⁸⁰ See, e.g., *Roads and Relay Hostels*, *JOURNEY TO CHINA*, <https://sites.google.com/a/fullerton.edu/journey-to-china/lesson-plans/chinese-innovations/roads-and-relay-hostels> (last visited May 18, 2015) (discussing the roads and relay hostels of the Tang & Song dynasties circa 700 AD); MONICA L. WRIGHT, *WEAVING NARRATIVE: CLOTHING IN TWELFTH-CENTURY FRENCH ROMANCE* 29–33 (2010) (examining how increased trade led to twelfth-century merchant class improvements in relaying information).

time, non-local demand and supply conditions.”⁸¹ Summarized below, the number of information specialists, brokers, delivery agents, and other intermediaries grew significantly soon thereafter to create market efficiencies and build transaction volume.

Telegraph. The first working transatlantic cable was installed in 1864, connecting Manchester and New York.⁸² This cable reduced communication time considerably, allowing a message and a response to be sent in the same day.⁸³ “[T]his and subsequent cables were financed by the British textile industry which was the first industry to realize the benefits of instantaneous communication (they were interested in the supply conditions of cotton in the US).”⁸⁴ In 1873, 1874, and 1894, British-, French-, German-, and American-owned cables were laid linking Europe and North America in a web of faster communication.⁸⁵

Steamship. Before the transatlantic cable, communications between Europe and North and South America took place only by ship, which severe winters could delay for weeks. The expanded use of steamships in the 1840s allowed information to cross the Atlantic in two weeks rather than two months.⁸⁶ Not only did information on cotton conditions get to British manufacturers much sooner, cotton and other product samples traveled quicker as well.

These intermediary instruments, and the delivery agents that facilitated them, helped build a burgeoning market for commodities trading and, of course, speculation.

3. Speculators Enter the Market

“Historically, gold and silver [were] the only commodities [that had] been used as hedging instruments by agents who [had] nothing to do with the ‘precious metals industry.’”⁸⁷ An example is grain markets in North America. “Speculators in grain first appeared at Chicago in the 1840s,” once steamships began

⁸¹ JOHN BAFFES, COMMODITY FUTURES EXCHANGES: HISTORICAL EVOLUTION AND NEW REALITIES 5 (2011), available at <http://www.agriskmanagementforum.org/sites/agriskmanagementforum.org/files/Baffes%20Futures%20Trading%20Zurich%20%20June%209%2010%202011.pdf>.

⁸² *Id.* at 6.

⁸³ See A.J. WILSON, THE LIVING ROCK: THE STORY OF METALS SINCE EARLIEST TIMES AND THEIR IMPACT ON DEVELOPING CIVILIZATION 203 (1994).

⁸⁴ BAFFES, *supra* note 81, at 6.

⁸⁵ *Transatlantic Telegraph Cable*, WIKIPEDIA, http://en.wikipedia.org/wiki/Transatlantic_telegraph_cable (last visited May 18, 2015).

⁸⁶ BAFFES, *supra* note 81, at 5.

⁸⁷ *Id.* at 12.

transporting information and articles of trade faster.⁸⁸ Under economists John Keynes and John Hicks' theory of *normal backwardation*, "a producer of grain would sell grain futures to lock in the future price of his crops and obtain insurance against the price risk of grain at harvest time."⁸⁹ "Speculators would provide this insurance and buy futures, but demand a futures price which [was] below the spot price that could be expected to prevail at the maturity of the futures contract,"⁹⁰ receiving "a risk premium from producers for assuming the risk of future price fluctuations."⁹¹ With development of grain warehousing, speculation shifted to warehouse receipts, and from there, the development of futures exchanges provided a more convenient and economic means of speculation.

4. Marketplaces for Exchange Are Developed

Equipped with new means to obtain commodities supply information quickly, and new futures contracts on which to speculate, merchants, producers, and brokers needed central marketplaces for trading commodities futures contracts. By the end of the 1880s, in the agricultural revolution following the American Civil War,⁹² five cotton futures exchanges were connected by cable: Buffalo, New York City, Manchester, Havre, and Alexandria. Soon, futures exchanges became global institutions for trading many commodities, including flour, corn, wheat, and eggs.⁹³ These exchanges grew out of the need for marketing functions that the existing markets were not providing. As a result, the production of, and trade for, certain commodities grew. For example, wheat production climbed from 170 million bushels farmed from 15 million acres in 1866, to 502 million bushels farmed from 38 million acres by 1880.⁹⁴ Those ready to assume risks profited from seizing opportunities, and central marketplaces facilitated opportunities that did not exist

⁸⁸ Harold D. Guither, Comment, *Commodities Exchanges, Agrarian "Political Power," and the Antioption Battle*, 48 AGRIC. HIST. 126, 128 (1974).

⁸⁹ Gary Gorton & K. Geert Rouwenhorst, *Facts and Fantasies About Commodity Futures* 3–4, 12 (Wharton Fin. Insts. Ctr., Working Paper No. 06-07, 2005), available at <http://fic.wharton.upenn.edu/fic/papers/06/0607.pdf>.

⁹⁰ *Id.* at 4.

⁹¹ *Id.* at 4, n.5 (citing 2 JOHN M. KEYNES, A TREATISE ON MONEY 144 (1930) ("In other words, the quoted forward price, though above the present spot price, must fall below the anticipated future spot price by at least the amount of normal backwardation.")).

⁹² H.R. DOC. NO. 76-695, at 221–22 (1940).

⁹³ BAFES, *supra* note 81, at 5–6, 13. For example, the New York Cotton Exchange (NYCE), established in 1870, operated as an independent entity until 1998 when it merged with the Coffee, Sugar, and Cocoa Exchange (CSCE), founded in 1882.

⁹⁴ HAROLD D. GUITHER, HERITAGE OF PLENTY: A GUIDE TO THE ECONOMIC HISTORY AND DEVELOPMENT OF U.S. AGRICULTURE 264 tbl.10 (2d ed. 1972).

without the transparency and pricing mechanisms provided by these platforms.⁹⁵

5. Development of Derivatives

When the steamships allowed information and commodities to travel faster, “merchants in Liverpool [began] trading ‘to arrive’ or ‘in transit’ contracts, more than one month prior to the physical transaction.”⁹⁶ This was the emergence of futures contracts in commodities. However, innovation in futures contracts did not explode until the twenty-first century, creating a new derivatives market for commodities that now provides new speculation and trading opportunities that did not exist in the nineteenth century.⁹⁷ New derivatives include products such as commodity futures index funds.⁹⁸ Economists Parantap Basu and William Gavin suggest that it may not have been until this evolutionary stage, which did not occur until the last ten to fifteen years, that commodities became a real tradable asset class:

[There has been a] massive increase in trading in commodity derivatives over the past decade—growth that far outstrips the growth in commodity production and the need for derivatives to hedge risk by commercial producers and users of commodities. During the past decade, many institutional portfolio managers added commodity derivatives as an asset class to their portfolios.⁹⁹

II. THE MARKET FOR PATENT ASSETS

A. Closely-Held and Thinly-Traded Assets

1. Increasing Value and Risk of Intellectual Property

For two centuries, the patent transaction market was a private, clandestine market that preferred the exclusive nature of the rights over the collaborative nature of rights transfer. Over the past thirty-five years, corporate value, or what is traditionally perceived to drive corporate value, has changed from being comprised mostly of tangible assets to intangible assets.¹⁰⁰ Among other causes, the inverse has resulted because

⁹⁵ Guither, *supra* note 88, at 128–29.

⁹⁶ BAFES, *supra* note 81, at 5.

⁹⁷ Parantap Basu & William T. Gavin, *What Explains the Growth in Commodity Derivatives?*, 93 FED. RES. BANK ST. LOUIS REV. 37, 37–48 (2011), available at <http://research.stlouisfed.org/publications/review/11/01/37-48Basu.pdf>.

⁹⁸ *Id.* at 38.

⁹⁹ *Id.* at 37.

¹⁰⁰ *Intangible Asset Market Value*, *supra* note 2 (“Intangible book value is calculated by subtracting the tangible book value from the market capitalization of a given company or index. In practice, companies report tangible book value per share, number of shares

of an increased recognition of intangible assets for accounting purposes and because of the internet and information age driving a new knowledge economy where, for example, companies having few assets other than a website, customer list (or subscribers), and patents can have billion-dollar valuations.¹⁰¹ Moreover, the financial crisis in 2008 forced many companies to look to alternative assets to create value, and patents became a focus for revenue generation.¹⁰²

The Financial Accounting Standards Board (FASB) has taken measures in the past decade to make sure companies are recognizing and distinguishing amortizable intangible assets such as intellectual property from goodwill. FASB Statement of Financial Accounting Standards No. 141, *Business Combinations*,¹⁰³ and Statement of Financial Accounting Standards No. 142, *Goodwill and Other Intangible Assets*,¹⁰⁴ require that companies can no longer combine goodwill with intellectual property on their balance sheets. Instead they must report these intangibles separately and categorize the asset classes by type of intellectual property, providing the estimated useful lives of such intangible assets in financial statements. The result did not increase the value of intellectual property, but instead raised awareness of accounting and valuation of intellectual property previously ignored for these purposes. This process has opened eyes over the past twenty years to the value

outstanding, and market capitalization. Therefore, intangible book value can be calculated by subtracting the market capitalization from the tangible book value per share multiplied by the number of shares outstanding. It is expedient to do the calculation on a per share basis, as we have done here, and simply subtract the tangible book value per share from the market price. There are modest discrepancies between the two numbers due to differences in setting shares outstanding on a company by company basis. However, the discrepancy is rarely a few percentage points which are within the error needed for most purposes.”)

¹⁰¹ RICARDO BLAUG & ROHIT LEKHI, WORK FOUND., ACCOUNTING FOR INTANGIBLES: FINANCIAL REPORTING AND VALUE CREATION IN THE KNOWLEDGE ECONOMY 11–21 (2009), available at http://www.theworkfoundation.com/assets/docs/publications/223_intangibles_final.pdf.

¹⁰² WORLD INTELLECTUAL PROP. ORG., WORLD INTELLECTUAL PROPERTY INDICATORS 8–10 (2010), available at http://www.wipo.int/edocs/pubdocs/en/intproperty/941/wipo_pub_941_2010.pdf.

¹⁰³ FIN. ACCOUNTING STANDARDS BD., FIN. ACCOUNTING FOUND., PUB. NO. 299-A, STATEMENT OF FINANCIAL ACCOUNTING STANDARDS NO. 141 (revised 2007): BUSINESS COMBINATIONS, at ii (2007), available at http://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220124931&acceptedDisclaimer=true.

¹⁰⁴ FIN. ACCOUNTING STANDARDS BD., FIN. ACCOUNTING FOUND., STATEMENT OF FINANCIAL ACCOUNTING STANDARDS NO. 142: GOODWILL AND OTHER INTANGIBLE ASSETS 5 (2001), available at http://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220124961&acceptedDisclaimer=true.

that patent assets protect, helping to attribute part or all of this value to the patents themselves in some cases.¹⁰⁵

In addition, the 1990s introduced a new knowledge economy¹⁰⁶ and an Internet age that has contributed to multi-billion-dollar valuations for companies that are not the manufacturing companies or industrial juggernauts that once dominated the S&P 500.¹⁰⁷ For these and other companies where competition depends heavily on information and protection of knowledge and business processes to gain competitive advantage, IP strategy has become paramount.¹⁰⁸ More recently, the financial crisis in 2008 caused companies to turn to their patents to generate new income, evidenced by the numerous creative patent transactions and privateering deals structured by companies since 2008.¹⁰⁹ Deals that transfer patents to independent third parties in return for participation in licensing and litigation proceeds continue to remain popular through 2014, transforming patents into a lucrative article of trade.¹¹⁰ For example, in January 2012, wireless firm Adaptix sold more than

¹⁰⁵ The Nortel Networks bankruptcy and windup of its assets demonstrated that the company's patents were worth more than all of its other assets. The company's assets were sold for approximately \$3 billion, while the patent portfolio was sold for \$4.5 billion. *See Nortel: Wind-Up*, WIKIPEDIA, <http://en.wikipedia.org/wiki/Nortel#Wind-up> (last visited May 18, 2015).

¹⁰⁶ *See generally* IAN BRINKLEY, WORK FOUND., *DEFINING THE KNOWLEDGE ECONOMY* (2006), available at http://www.theworkfoundation.com/downloadpublication/report/65_65_defining%20knowledge%20economy.pdf.

¹⁰⁷ *See, e.g.*, Scott DeCarlo, *The World's 25 Most Valuable Companies: Apple Is Now on Top*, FORBES (Aug. 11, 2011, 10:27 AM), <http://www.forbes.com/sites/scottdecarlo/2011/08/11/the-worlds-25-most-valuable-companies-apple-is-now-on-top/>; Evelyn M. Rusli & Douglas MacMillan, *Uber Gets an Uber-Valuation: Car Service Secures \$1.2 Billion in Funding, Valuing It at \$18.2 Billion, Among Highest Ever*, WALL ST. J. (June 6, 2014), <http://www.wsj.com/articles/uber-gets-uber-valuation-of-18-2-billion-1402073876>; Wayne Busch & Juan Pedro Moreno, *Banks' New Competitors: Starbucks, Google, and Alibaba*, HARV. BUS. REV. (Feb. 20, 2014), <https://hbr.org/2014/02/banks-new-competitors-starbucks-google-and-alibaba>.

¹⁰⁸ Allen W. Wang, *Rise of the Patent Intermediaries*, 25 BERKELEY TECH. L.J. 159, 162–65 (2010) (citing Ashby H.B. Monk, *The Emerging Market for Intellectual Property: Drivers, Restraints, and Implications*, 9 J. ECON. GEOGRAPHY 469, 482 (2009) (stating that business managers now view patents as “an important asset class that can be monetized to generate income”)).

¹⁰⁹ *See* Tom Ewing, *Indirect Exploitation of Intellectual Property Rights by Corporations and Investors*, 4 HASTINGS SCI. & TECH. L.J. 1, 10 (2012) (“[O]perating companies have increasingly explored indirect uses of IPRs, from buying patents and then asserting them against competitors to buying patents solely for the purpose of filing a countersuit in an infringement litigation initiated by a competitor.”); *see also* Ashby Jones, *The Amazing Adventures of Mr. Desmarais and Mr. Powers*, WALL ST. J. (Jan. 23, 2012, 10:35 AM), <http://blogs.wsj.com/law/2012/01/23/THE-amazing-adventures-of-mr-desmarais-and-mr-powers/>.

¹¹⁰ Ewing, *supra* note 109, at 3; Jones, *supra* note 109.

200 patents to patent licensing firm Acacia.¹¹¹ In July 2012, Fujifilm sold 1200 patents to patent licensing and technology firm Universal Display.¹¹² On December 16, 2013, Panasonic sold 900 patents to patent licensing firm Wi-Lan, and on January 6, 2014, it sold 500 additional patents to patent licensing firm Inventergy.¹¹³ Nokia has sold its patents to various licensing agent firms more than twenty times since 2008.¹¹⁴ These represent just a fraction of similar deals consummated in the past five years. Moreover, AT&T, among other companies, has developed website pages dedicated to offering certain of its patents for sale.¹¹⁵ Most of these types of transactions remain confidential and without price discovery.

A well-publicized example of both the increased recognition of intellectual property and the increased dependency on patents to compete is the recent sale of bankrupt Nortel Networks Corporation's patent portfolio. After most of Nortel's other assets were sold to various companies for an approximate aggregate value of \$3 billion, Nortel's patent portfolio, presumably protecting these assets and businesses, was sold through auction for \$4.5 billion.¹¹⁶ This auction demonstrates both the old guard and the new guard. Representing the old guard through Nortel's role, the event highlights what companies have traditionally neglected to recognize—namely, the value of patent assets attributable to shareholder value. Representing the new guard, it demonstrates through the role of the winning bidders the increased emphasis on the value of patent assets—namely, the significance of high-stakes patent weaponry to competition. Specifically, the winning bid came from a consortium of companies, all aligned by the same competitive interest—to keep the patents out of the hands of Google.¹¹⁷ Therefore, the patents

¹¹¹ See Ben Dummett, *Acacia to Acquire Adaptix for \$160 Million*, WALL ST. J. (Jan. 12, 2012, 11:57 PM), <http://www.wsj.com/articles/SB10001424052970204409004577157470455118362>.

¹¹² See Press Release, Fujifilm, Fujifilm Corporation Sells Its Worldwide OLED Patent Portfolio to Universal Display Corporation for US\$105 Million (July 24, 2012), available at <http://www.fujifilm.com/news/n120724.html>.

¹¹³ Joff Wild, *Panasonic Makes a Major Privateering Play as Japanese Companies Seek to Sweat Their Patents*, IAM BLOG (Jan. 10, 2014), <http://www.iam-magazine.com/Blog/Detail.aspx?g=9375cbd5-7354-41fe-bd18-32a5d392bfde>.

¹¹⁴ Susan Decker, *Patent Privateers Sail the Legal Waters Against Apple, Google*, BLOOMBERG (Jan. 10, 2013, 9:00 PM), <http://www.bloomberg.com/news/articles/2013-01-11/patent-privateers-sail-the-legal-waters-against-apple-google> (noting Nokia has transferred its patents to privateers for licensing income more than twenty times since 2008).

¹¹⁵ See *Patent Sales*, AT&T, <http://www.att.com/gen/sites/ipsales?pid=17701> (last visited May 18, 2015).

¹¹⁶ See *Nortel: Wind-Up*, *supra* note 105.

¹¹⁷ Joff Wild, *Google Bid \$4 Billion for the Nortel Patents and Still Lost – Updated*, IAM BLOG (July 2, 2011), <http://www.iam-magazine.com/blog/Detail.aspx?g=1d7387a7-70fe-4e12-807b-e568c19f63e1>.

had significant defensive value. Some of the patents have since been asserted, highlighting their offensive value as well.¹¹⁸

2. Patents Are Probabilistic Rights

A patent is an exclusive or negative property right,¹¹⁹ but it is not an absolute right. Once granted, the right may be subsequently eliminated or limited without recourse or compensation. Simply put, the United States Patent and Trademark Office (USPTO), like a football referee, makes mistakes, and instant replay is always available to wave off the initial grant of a touchdown and six points. In addition, the strength or value of the “right” depends on a number of factors, both intrinsic and acquired.¹²⁰ The value of a patent right depends on its enforceability, and enforceability depends on, among other things, the patent’s owner,¹²¹ validity, and claim coverage. Both validity and claim coverage are largely dependent upon subjective interpretation of, for example, the relevance of prior art references and the construction of claim language, respectively. The arbiter of interpretation is typically the USPTO or a federal court, and proceedings before either are popularly characterized as uncertain and unpredictable.¹²²

As a result, every decision to act on account of, or in ignorance of, relevant third-party patents, including the act of blatant copying or intentional use of a patent, holds a probability of liability greater than zero and less than one hundred. This circumstance exists because the issuance of a patent from the USPTO only includes a rebuttable presumption that the patent is valid.¹²³ Keith Leffler and Cristofer Leffler have described the circumstantial probability of patent rights:

[T]he right that Congress gave to patent holders as a reward for their invention was the right to seek redress in the federal courts. Congress expressly designated the federal courts as the body with institutional authority to determine patent validity and infringement. Moreover,

¹¹⁸ Joe Mullin, *Patent War Goes Nuclear: Microsoft, Apple-Owned “Rockstar” Sues Google*, ARS TECHNICA (Oct. 31, 2013, 8:10 PM), <http://arstechnica.com/tech-policy/2013/10/patent-war-goes-nuclear-microsoft-apple-owned-rockstar-sues-google/>.

¹¹⁹ 35 U.S.C. § 154(a)(1) (2012) (“Every patent shall contain a short title of the invention and a grant to the patentee, his heirs or assigns, of the right to exclude others from making, using, offering for sale, or selling the invention . . . and, if the invention is a process, of the right to exclude others from using, offering for sale or selling . . . products made by that process, referring to the specification for the particulars thereof.”).

¹²⁰ Colleen V. Chien, *Predicting Patent Litigation*, 90 TEX. L. REV. 283, 297–300 (2011) (noting that in addition to intrinsic characteristics, certain acquired characteristics of a patent, such as transferability, may also be used to predict the value of a patent).

¹²¹ *Id.* at 325.

¹²² *Id.* at 285.

¹²³ 35 U.S.C. § 282.

Congress did not provide, as it might have, that a patent once issued by the [PTO] is conclusively presumed to be valid. Rather, it provided that patents shall enjoy only a rebuttable presumption of validity. . . . [Therefore] patent rights are probabilistic—the only validity is that decided by the courts. That this set of rights is probabilistic does not mean that the patent “does not really exist until you go to court” or that the patent is “unborn.” Rather, in any patent dispute, until determined by a federal court, there is a probability that a patent will be found to be invalid.¹²⁴

Mark Lemley, among many other authors, has contributed significant thought to the probabilistic nature of patent rights.¹²⁵ Wrote Lemley:

Given [the] uncertainties, economists have increasingly recognized that a patent does not confer upon its owner the right to exclude but rather a right to *try* to exclude by asserting the patent in court. When a patent holder asserts its patent against an alleged infringer, the patent holder is rolling the dice. If the patent is found invalid, the property right will have evaporated.¹²⁶

The fact that the property right can be eliminated or modified subsequent to being granted is not the only factor making patent rights probabilistic. The right to exclude may only be enforced through court, and patent litigation is itself very unpredictable as a result of varying procedure by jurisdiction, the length and cost of proceedings, inconsistent precedent and jury instructions, and subjective interpretation of the construction of language.¹²⁷ Leffler and Leffler proclaimed “the ‘rights’ of a

¹²⁴ Keith Leffler & Cristofer Leffler, *The Probabilistic Nature of Patent Rights: In Response to Kevin McDonald*, ANTI-TRUST MAG., Summer 2003, at 77, 78 (citations omitted), available at <http://staff.washington.edu/kleffler/Probabilistic%20Patent%20Rights%204-21-03.doc>; see also 28 U.S.C. § 1338(a) (2012) (“The district courts shall have original jurisdiction of any civil action arising under any Act of Congress relating to patents”); 35 U.S.C. § 282.

¹²⁵ See, e.g., Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, J. ECON. PERSP., Spring 2005, at 75, available at <http://faculty.haas.berkeley.edu/shapiro/patents.pdf>.

¹²⁶ *Id.* (citations omitted).

¹²⁷ See Gretchen Ann Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time Is Ripe for a Consistent Claim Construction Methodology*, 8 J. INTEL. PROP. L. 175, 175 (2001) (“[T]he field of patent infringement litigation currently lacks the certainty and predictability necessary to efficiently litigate (and resolve) cases.”); see also Paul M. Janicke, *On the Causes of Unpredictability of Federal Circuit Decisions in Patent Cases*, 3 NW. J. TECH. & INTEL. PROP. 93, 93–94 (2005) (noting other scholars’ criticisms of “inconsistency” and “unpredictability” in Federal Circuit patent law decisions); Gerald J. Mossinghoff & Donald R. Dunner, *Increasing Certainty in Patent Litigation: The Need for Federal Circuit Approved Pattern Jury Instructions*, 83 J. PAT. & TRADEMARK OFF. SOC’Y 431, 432–33 (2001) (arguing for the adoption of uniform jury instructions for patent cases to reduce unpredictability in decisions); Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CALIF. L. REV. 1889, 1934 n.179 (2002) (“[T]he effort to map the words of patent claims to products is inherently an uncertain one.”); Michael A. Glenn, *Symposium Presentation: Business and Patents and Business Patents*, 22 HASTINGS COMM. & ENT. L.J. 203, 206 (2000) (“The scope of coverage is uncertain. . . . So you don’t really know what they cover until they’re

patent holder are those substantive and procedural rights that Congress has dictated and . . . the 'right to exclude' others from a market and collect monopoly rents is an uncertain right that can be represented by a probability that a patent will be found valid.¹²⁸ Measurements by the USPTO itself and empirical results from litigation indicate that a significant amount of patent claims are actually invalid.¹²⁹ As a result, patent rights are far less absolute than rights to tangible property.¹³⁰

3. The Patent Market Operates Without Reliable Quality and Value Benchmarks

Exacerbating the probabilistic nature of patents is the fact that even the *degree* of probability of patent validity and success in litigation is difficult to place anywhere in one of the two peripheral percentage quadrants (<25% or >75%), because there is very little information in the patent market which is discoverable and useful. Reliable transaction information is a core tenet of most efficient markets.¹³¹ Economist Friedrich Hayek argued in *The Pure Theory of Capital* that the goal of a market is the preservation and use of the unique information contained in the price of a good.¹³² Likewise, economist and markets theory expert Eugene Fama has stated clearly the role of information in an efficient market:

also tested in a court.”); Steve P. Calandrillo, *An Economic Analysis of Property Rights in Information: Justifications and Problems of Exclusive Rights, Incentives to Generate Information, and the Alternative of a Government-Run Reward System*, 9 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 301, 333 (1998) (“[P]atents . . . are often uncertain as to scope.”); Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1083 (1989) (“[T]he scope of patent claims is often uncertain until the claims are construed in litigation.”).

¹²⁸ Leffler & Leffler, *supra* note 124, at 77 (citing Keith Leffler & Cristofer Leffler, *Want to Pay a Competitor to Exit the Market? Settle a Patent Infringement Case*, ECON. COMMITTEE NEWSL. (ABA Section of Antitrust Law, Chi., Ill.), Spring 2002, at 26); *see also* Cristofer Leffler & Keith Leffler, *Settling the Controversy over Patent Settlements: Payments by the Patent Holder Should Be Per Se Illegal*, in ANTITRUST LAW AND ECONOMICS 475, 487 (John B. Kirkwood ed., Research in Law and Econ. Book Ser. Vol. 21, 2004).

¹²⁹ Susan Walmsley Graf, Comment, *Improving Patent Quality Through Identification of Relevant Prior Art: Approaches to Increase Information Flow to the Patent Office*, 11 LEWIS & CLARK L. REV. 495, 500–01 (2007).

¹³⁰ Leffler & Leffler, *supra* note 124, at 77; *see also* Kevin D. McDonald, *Hatch-Waxman Patent Settlements and Antitrust: On “Probabilistic” Patent Rights and False Positives*, ANTITRUST MAG., Spring 2003, at 68, 73 (noting the inherent uncertainty in entrusting the resolution of a technology case to a lay judge or jury); Steven Z. Szczepanski, *Licensing or Settlement: Deferring the Fight to Another Day*, 15 AIPLA Q.J. 298, 300–01 (1987) (“The chances of prevailing in [patent] litigation rarely exceed seventy percent . . . even in that rare case with great prospects.”).

¹³¹ *See generally* F.A. HAYEK, *THE PURE THEORY OF CAPITAL* (1941), *reprinted in* 12 THE COLLECTED WORKS OF F.A. HAYEK (Lawrence H. White ed., Univ. Chi. Press 2007).

¹³² *Id.*

[T]he ideal is a market in which prices provide accurate signals for resource allocation: that is, a market in which firms can make production-investment decisions, and investors can choose among the securities that represent ownership of firms' activities under the assumption that security prices at any time "fully reflect" all available information. A market in which prices always "fully reflect" available information is called "efficient."¹³³

However, in a patent market without information transparency and benchmarks, and with skewed outcomes resulting from bargaining positions dictated by the cost of litigation and factors such as secret offsets or the size of the parties' total portfolios, there is very little usable information contained in many transactions. Usable benchmarks require access to a larger sample size created under at least some standard conditions.

A comparison runs to the real estate market, which operates in the United States using the multiple listing service (MLS), a central marketplace with useful information and valuation benchmarks for brokers and appraisers who, in turn, must be certified and work under prescribed guidelines.¹³⁴ The efficient employment of the MLS is supported by a standardized course of dealing promulgated by the Real Estate Standards Organization that covers transaction data collection, transfer, and presentation.¹³⁵ Federal Circuit Chief Judge Randall Rader has recognized the comparison, stating, "realtors can [value houses] . . . Why can't we [value patents]? I know part of the answer, of course. . . . [A] real estate market has 20, 30, 40 comparables on the same block. And you are going to have a market to analyze and assess."¹³⁶ In the market for patent rights, there is no MLS or other central platform or marketplace that helps to keep intangibles constant and create benchmarks that provide useful information to all market participants.¹³⁷ Market

¹³³ Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FIN. 383, 383 (1970), available at <http://www.e-m-h.org/Fama70.pdf>.

¹³⁴ The MLS is a suite of services that enables real estate brokers to establish contractual offers of compensation (among brokers), facilitates cooperation with other broker participants, accumulates and disseminates information to enable appraisals, and provides a facility for the orderly correlation and dissemination of listing information to better serve brokers' clients, customers, and the public. See, e.g., *Multiple Listing Service (MLS): What Is It*, NAT'L ASS'N REALTORS, <http://www.realtor.org/topics/nar-doj-settlement/multiple-listing-service-mls-what-is-it> (last visited May 18, 2015).

¹³⁵ See *Association/MLS Executives*, REAL EST. STANDARDS ORG., <http://www.reso.org/for-mls-executives> (last visited May 18, 2015).

¹³⁶ John R. Bone, David A. Haas & David N. Paris, *View from the Federal Circuit: An Interview with Chief Judge Randall R. Rader*, SRR J., Fall 2012, at 100, 101, available at <http://www.srr.com/assets/pdf/view-federal-circuit-an-interview-chief-judge-randall-rader.pdf>.

¹³⁷ See, e.g., Ian David McClure, *Commoditizing Intellectual Property Rights: The Practicability of a Commercialized and Transparent International IPR Market and the*

dynamics similar to those that have resolved market inefficiencies in many industries for hundreds of years simply do not exist in the patent market.¹³⁸

The patent market is primarily comprised of traditional bilateral negotiations and rogue activity.¹³⁹ The price and terms of most transactions are kept confidential.¹⁴⁰ In some cases, the entity controlling a patent and any third-party beneficiaries of the transaction are not revealed—even to the transacting parties.¹⁴¹ The lack of transparency and useful information was recently highlighted in a letter to Congress signed by sixty law professors from twenty-six different states and the District of Columbia who teach and write about intellectual property law and policy.¹⁴² The professors acknowledged that inefficiency and abusive patent litigation “thrives due to a lack of reliable information about patent rights.”¹⁴³

The aforementioned Nortel patent portfolio sale highlighted the inability to objectively value patents in a clandestine market. Before the auction, multiple independent valuation experts were engaged to analyze the portfolio, resulting in valuations reaching \$1.5 billion.¹⁴⁴ Google submitted the “hocus pocus” bids of \$1,902,160,540 (Brun’s constant),¹⁴⁵ \$2,614,972,128 (Meissel-Merten’s

Need for International Standards, 6 BUFF. INTELL. PROP. L.J. 13, 28–29 (2008) (citing JOHN TURNER, VALUATION OF INTELLECTUAL PROPERTY ASSETS; VALUATION TECHNIQUES: PARAMETERS, METHODOLOGIES AND LIMITATIONS 9 (2000), available at http://www.wipo.int/export/sites/www/sme/en/documents/valuationdocs/inn_ddk_00_5xax.pdf).

¹³⁸ *Id.*

¹³⁹ *Id.* at 20 (citing Perry J. Viscounty, Michael Woodrow De Vries & Eric M. Kennedy, *Patent Auctions, Emerging Trend?*, NAT’L L.J., May 8, 2006, at S12, available at <http://www.nationallawjournal.com/id=900005452909/Patent-auctions-emerging-trend>).

¹⁴⁰ *Id.*; JOHN T. JOHNSON & MICHAEL F. AUTUORO, IP VALUATION 17 (2014), available at http://www.aipla.org/committees/committee_pages/IP-Practice-in-Japan/Committee%20Documents/Forms/AllItems.aspx (follow “2014 MWI Presentations” hyperlink; then follow “John Johnson – IP Valuation” hyperlink).

¹⁴¹ See generally Letter from John R. Allison et al., Intellectual Prop. Law Professors, to the Members of the United States Congress (Nov. 25, 2013), available at <http://patentlyo.com/media/2014/02/professorsletteronrolls.pdf>.

¹⁴² See generally *id.*

¹⁴³ *Id.* at 2.

¹⁴⁴ See Julie Triedman, *With Cleary Presiding, Nortel Patent Auction Could Be Biggest Ever*, AM. L. DAILY (June 24, 2011, 2:21 PM), <http://amlawdaily.typepad.com/amlawdaily/2011/06/nortelpatentauction.html> (noting pre-auction valuations reaching \$1.5 billion); see also *Nortel Bankruptcy Patent Auction Is Biggest Technology Patent Sale Ever*, FULCRUM INQUIRY (July 2011), http://www.fulcrum.com/nortel_bankruptcy_patent_auction.htm (“Although the price is breathtaking, it is still a fraction of Nortel’s reported 15-year investment in those patents of nearly \$40 billion. This demonstrates that patents cannot be valued correctly using the cost approach.”); Maulin Shah, *Varying Kodak Patent Valuations Make Auction Price Difficult to Predict*, PATENTVUE (July 30, 2012, 6:15 PM), <http://patentvue.com/2012/07/30/605/> (describing the discrepancy in valuations for the Kodak patent portfolio prior to its auction as between \$818 million and \$4.5 billion).

¹⁴⁵ See Wild, *supra* note 117.

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constant),¹⁴⁶ and finally \$3.14159 billion (pi).¹⁴⁷ With a resulting sale price of \$4.5 billion, these events make it clear that patent valuation lacks the objective benchmarking and market comparisons—the complete information—that are needed for an efficient market. As will be detailed in the next section, this is not a laughing matter, despite Google’s fun. It is one of the key characteristics of the patent market which provides perfect conditions for exploitation of “lemons” and abusive patent litigation—something which Google is adamant about combating.¹⁴⁸

4. Adverse Selection and the Patent Market for Lemons

The catalyst for exploitation of patent market inefficiencies and the recent increase in patent litigation is the uncertainty surrounding the validity, scope, and value of patents, creating what George Akerlof, winner of the Nobel Prize in Economic Sciences, coined a “Market for Lemons,” or adverse selection of patents.¹⁴⁹

In his classic 1970 article “The Market for Lemons: Quality Uncertainty and the Market Mechanism,” Akerlof focused on the automobile market to provide a new explanation for a well-known phenomenon: only slightly used cars sell for much less than new cars.¹⁵⁰ Employing a simple yet powerful model, Akerlof assumed that some cars are “lemons” and some are high quality. If buyers could distinguish between lemons and high quality cars, two separate markets would exist: a market for lemons and a market for high-quality cars.¹⁵¹ However, in 1970 information asymmetries riddled this market: sellers had information about the probability that a car was a lemon, while buyers did not have general access to this information.¹⁵² Under these conditions, a buyer knows that there is some probability that he is buying a lemon and therefore is willing to pay less than he would pay if he knew that he was buying a high-quality

¹⁴⁶ *Id.*

¹⁴⁷ Nadia Damouni, *Dealtalk: Google Bid “Pi” for Nortel Patents and Lost*, REUTERS (July 1, 2011, 10:30 PM), <http://www.reuters.com/article/2011/07/02/us-dealtalk-nortel-google-idUSTRE76104L20110702>.

¹⁴⁸ *Wal-Mart, Google, Others Back U.S. Bill to Fight ‘Patent Trolls,’* REUTERS (July 30, 2013, 6:31 PM), <http://www.reuters.com/article/2013/07/30/us-usa-congress-patent-idUSBRE96T1ER20130730>; Susan Decker, *Canon and Google Fight to Limit Patent Claims*, BLOOMBERG BUS. (July 17, 2014), <http://www.bloomberg.com/bw/articles/2014-07-17/google-canon-team-up-in-fight-to-limit-patent-claims>.

¹⁴⁹ See generally Akerlof, *supra* note 17.

¹⁵⁰ *Id.* at 489.

¹⁵¹ *Id.*

¹⁵² Today, there are tools like CARFAX to create more information parity. See CARFAX, <http://www.carfax.com> (last visited May 18, 2015).

car. Furthermore, there is a high cost to finding out the actual quality of the car—purchasing and driving the car until it breaks down—causing some to refrain from purchasing a car at all.¹⁵³ This lowers the price for all used cars—lemons and high quality—and encourages sellers of lemons and discourages sellers of high-quality cars. Although some sellers would be willing to sell high-quality cars at prices buyers would be willing to pay for high-quality cars, they will not sell them at a price that reflects the risk that the buyer may end up with a lemon, and the buyer will not pay the higher price without assurance that it is high quality.¹⁵⁴ Thus, exchanges that could have benefited both buyer and seller failed to take place and efficiency was lost.¹⁵⁵ Note that since 1970 the used car market has introduced information symmetries with tools like CARFAX that provide objective and standardized information about a car's history to buyers. The used car market has also created additional buyer confidence by offering used car warranties.¹⁵⁶

Writing thirty years after he published “The Market for Lemons,” in a 2001 Nobel Prize statement George Akerlof reflected on the profound reality of the discovery he had made and its cross-market application:

[A]symmetric information was potentially an issue in any market where the quality of goods would be difficult to see by anything other than casual inspection. Rather than being a handful of markets, the exception rather than the rule, that seemed to me to include most markets. Thus the paper that I would write would give the automobile market as the example, its potential “collapse” as the theorem, and then I would discuss how this example would apply to credit and insurance.¹⁵⁷

The phenomenon extends to patent rights as well. In the market for patents, it is common knowledge that lemons—patents with invalid claims—exist, but there is no CARFAX-like tool, and most, if not all, transactions in which this author has

¹⁵³ Akerlof, *supra* note 17, at 490–92.

¹⁵⁴ Eventually, as Akerlof surmised would happen, the used car market began offering warranties to buyers that raised used car prices to a suitable equilibrium. The author of this Article has yet to see any form of such a warranty or representation of validity or value in the patent market, and, in fact, most, if not all, transactions in which the author has been involved have included *express disclaimers* of any such warranty or representation.

¹⁵⁵ George A. Akerlof (1940–), LIBR. ECON. AND LIBERTY, <http://www.econlib.org/library/Enc/bios/Akerlof.html> (last visited May 18, 2015).

¹⁵⁶ See *supra* notes 152–153 and accompanying text; see also Kelsey Mays, *Making Sense of Used-Car Warranties*, CARS.COM (June 4, 2013), <http://www.cars.com/go/advice/Story.jsp?section=buy&story=usedWarranty&subject=warranty>.

¹⁵⁷ George A. Akerlof, *Writing the “The Market for Lemons”: A Personal and Interpretive Essay*, NOBELPRIZE.ORG (Nov. 14, 2003), http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2001/akerlof-article.html.

been involved have expressly disclaimed any warranty or representation of validity or enforceability. More specifically, there is no standard of review and few public benchmarks available to help buyers (licensees) make quick and informed decisions. As a result, like used cars in 1970, the market for patents is restrained, reflecting the problem that any patent may be invalid or unenforceable. In addition, the cost and risk involved in having a court—the only forum available—determine validity, scope, and value is extremely high.¹⁵⁸ As a result, some lemons are attributed some value—a nuisance value—to avoid those costs and risks.¹⁵⁹

Therefore, as a result of (1) the increased recognition of patents as a valuable corporate asset, (2) the probabilistic inherency of patent rights, and (3) the lack of reliable benchmarks or a marketplace or even a standard course dealing where low-cost diligence or “casual inspection” can inform decision-making, a perfect storm is created around the proliferation of uncertainty. As a result, the exploitation of patent lemons and adverse selection thrives. The current “patent market for lemons” is exploited by one category of market participants—NPEs—most efficiently because of a higher tolerance for risk resulting from the ability to enforce patents without risk of counter-assertion or reputation reduction. The storm is real, and consequences have threatened to collapse a burgeoning patent market as we know it—at least for the speculators.¹⁶⁰

Regardless of the merits of the exploitation of these circumstances in the patent market—on which there are many different opinions¹⁶¹—it is sufficient for the import of this Article

¹⁵⁸ AM. INTELLECTUAL PROP. LAW ASS'N, *supra* note 8.

¹⁵⁹ Kravets, *supra* note 14.

¹⁶⁰ See generally *Hearing on Abusive Patent Litigation*, *supra* note 10. The first subcommittee hearing on these issues was held on March 14, 2013, and addressed the impact of abusive patent litigation by NPEs on innovation and jobs in the U.S., as well as potential solutions, such as the SHIELD Act, discovery limits, cost shifting, utilization of intervention and impleader rules, staying suits against end-users, alternative damages calculations, stricter drafting requirements for patent claims, and mandatory recodation of assignments. The witnesses during the hearing were: Mark Chandler, Senior Vice President, General Counsel, and Secretary, Cisco Systems, Inc.; Janet L. Dhillon, Executive Vice President, General Counsel, and Secretary, J.C. Penney Company, Inc.; John G. Boswell, Senior Vice President, Chief Legal Officer, and Corporate Secretary, SAS Institute, Inc.; C. Graham Gerst, Partner, Global IP Law Group, LLC; Philip S. Johnson, Senior Vice President and Chief Intellectual Property Counsel, Johnson & Johnson; Dana Rao, Vice President and Associate General Counsel for Intellectual Property Litigation, Adobe Systems, Inc. *Id.*

¹⁶¹ The merits, impact, and even definition of an NPE or “patent troll” has been the subject of much academic, industry, and legislative comment over previous years. This was highlighted by the recent introduction of Senator Leahy’s bill, the Patent Transparency and Improvement Act of 2013, and Representative DeFazio’s bill, the

to understand that the growth in recognition of patents as an asset class, combined with the abovementioned market characteristics, has caused an increase in patent litigation and the risk resulting thereof, which, in turn, has initiated the development of many new resources, business models, and intermediaries to alleviate this risk that did not exist before. While the market remains very inefficient, it is by no means as inefficient as it once was a decade ago.

B. Specialists and Intermediaries Emerge to Facilitate Transactions

The concept of exclusive patent rights is not new. The Greek colony of Sybaris granted exclusive rights to inventions as early as 500 BC.¹⁶² During the Ming Dynasty in China, manufacturers of pottery were required to mark their products to ensure quality and properly direct complaints.¹⁶³ In 1474, a Venetian law specifically provided for patent rights to instill monetary motivations for further invention.¹⁶⁴ Of course, our forward-looking Founding Fathers were quite aware of the significance of new ideas in a flourishing economy.¹⁶⁵ The concept of patent management, however, is still evolving as a complex and sensitive issue. Yet increased risk and uncertainty in the patent market has placed new emphasis on patent management.¹⁶⁶ Because fundamentals of internally handling a

Saving High-Tech Innovators from Egregious Legal Disputes (SHIELD) Act of 2013. For a taste of the many perspectives and problematic policy issues in defining an NPE or “patent troll” (this author does not condone free use of the “patent troll” term, for reasons that should be obvious by reviewing these perspectives), see *What Is an NPE?*, PAT. FREEDOM, <https://www.patentfreedom.com/about-npes/background> (last visited May 18, 2015); Brian W. Hannon & Margaret M. Welsh, *Challenges of Defining a Patent Troll*, BLOOMBERG L. (July 29, 2013), <http://www.bna.com/challenges-of-defining-a-patent-troll/>; Joff Wild, *It's Time to Tell the Truth About Trolls*, IAM BLOG (Oct. 22, 2013), <http://www.iam-magazine.com/blog/Detail.aspx?g=0f3ffd33-f434-40c0-b3bb-6cb3b6ea91a5>.

¹⁶² HERBERT F. SCHWARTZ, *PATENT LAW AND PRACTICE* 1 (2d ed. 1995); Edward C. Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part I)*, 76 J. PAT. & TRADEMARK OFF. SOC'Y 697, 701–04 (1994).

¹⁶³ DAVID S. BLOCH, *MONETIZATION OF PATENT AND OTHER IP RIGHTS: AN INTRODUCTION* 1 (2009), available at http://fordhamipconference.com/wp-content/uploads/2010/08/David_Bloch_Monetization_of_Patent_and_Other_IP_Rights.pdf; see also *Chinese Pottery: The Ming Dynasty (1368–1644)*, ENCYCLOPEDIA BRITANNICA, <http://www.britannica.com/EBchecked/topic/718528/Chinese-pottery/283177/The-Ming-dynasty-1368-1644> (last updated Feb. 6, 2014).

¹⁶⁴ Giulio Mandich, *Venetian Origins of Inventors' Rights*, 42 J. PAT. OFF. SOC'Y. 378, 379–81 (1960).

¹⁶⁵ See U.S. CONST. art. I, § 8, cl. 8.

¹⁶⁶ *Efficiency Under Threat for IP Teams as Workload Pressures Continue to Increase, Reveals CPA Global IP Industry Survey*, CPA GLOBAL (Oct. 27, 2014), <https://www.cpa-global.com/NewsEvents/PressReleases/2014-10-27/Efficiency-under-threat-for-IP-teams-as-workload-pressures-continue-to-increase-reveals-CPA-Global-IP-industry-survey/> (“Reflecting greater global recognition of the value of IP and a trend towards more strategic IP management, corporate respondents report that (other than budget/resource

complex business matter remain inefficient given that the information available is not ideal, independent resources and service providers have increasingly held themselves out as having the answers. This is the new patent services market.

The rise in development of these resources began in the early 2000s, when the first public patent auctions purported to demonstrate a liquefying market for patents as an asset class.¹⁶⁷ Operating companies were not prepared to satisfy their own patent information needs through internal resources and processes, and innovative business models have since grown rapidly to meet the demand.¹⁶⁸ These resources include self-operated software programs designed to help operating companies identify problematic patents, and patent management and consulting firms that are quite sophisticated in doing this work on behalf of an operating entity.

Since 2000, a competitive and somewhat saturated market has become established for self-use software products that aggregate publicly available patent data and run algorithms to produce useful patent search and evaluation outputs. A non-exhaustive list of these tools includes:

Innography¹⁶⁹
Pantros IP¹⁷⁰
PatentRatings¹⁷¹
Thomson Innovation¹⁷²
Ambercite¹⁷³
Google Patents¹⁷⁴
MaxVal-IP¹⁷⁵
Astamuse¹⁷⁶

pressures) the factors that are having the most impact on their work include the need for greater alignment of IP with business strategy (59%) and increased pressure to optimise/monetise IP portfolios (49%).”)

¹⁶⁷ John Jarosz et al., *Patent Auctions: How Far Have We Come?*, 45 LES NOUVELLES 11, 16 (2010), available at http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Jarosz_Patent_Auctions_How_Far_Have_We_Come.pdf.

¹⁶⁸ See, e.g., Wang, *supra* note 108; Mario Benassi & Alberto Di Minin, *Playing in Between: Patent Brokers in Markets for Technology*, 39 R&D MGMT. 68, 69 (2009), available at <http://onlinelibrary.wiley.com.libproxy.chapman.edu/doi/10.1111/j.1467-9310.2008.00537.x/pdf>.

¹⁶⁹ See INNOGRAPHY, <https://www.innography.com> (last visited May 18, 2015).

¹⁷⁰ See IP.COM, <http://ip.com> (last visited May 18, 2015).

¹⁷¹ See PATENT RATINGS INTERNATIONAL, <http://www.patentratings.com> (last visited May 18, 2015).

¹⁷² See THOMSON INNOVATION, <http://info.thomsoninnovation.com> (last visited May 18, 2015).

¹⁷³ See AMBERCITE, <http://www.ambercite.com> (last visited May 18, 2015).

¹⁷⁴ See GOOGLE, <https://www.google.com/?tbs=pts> (last visited May 18, 2015).

¹⁷⁵ See MAXVAL, <http://www.maxval.com/patent-tools.html> (last visited May 18, 2015).

¹⁷⁶ See ASTAMUSE, <http://www.astamuse.co.jp/en/> (last visited May 18, 2015).

Sumobrain¹⁷⁷
PatentBuddy¹⁷⁸
PetaPator¹⁷⁹

Proper use of these products can provide information about a patent landscape related to a particular technology, or of a company's patent holdings relative to competitors associated with a particular product or research area.¹⁸⁰ Many patent holding firms, technology companies and manufacturers, and even investors use these tools. However, they are not complete replacements for human capital and expert review.¹⁸¹ They are, in fact, resources that make the human capital required to perform effective patent search and expert review of the results manageable.¹⁸² Supporting this understanding, at least one firm, Lex Machina, provides patent litigation data that can help potential litigants and other entities weigh probabilities and measure potential outcomes based on technology areas, jurisdiction, and other inputs.¹⁸³

In addition to these self-use tools, which are generally sold under a software license, an abundance of patent research and consulting firms are new to the market in the past fifteen years and provide analytical and technical evaluation services—a second-phase step after patent information is gathered. A representation of this category of service providers includes:

IPVision¹⁸⁴
IP Capital Group¹⁸⁵
Evalueserve¹⁸⁶
Red Oak IP, LLC¹⁸⁷
Ocean Tomo, LLC¹⁸⁸

¹⁷⁷ See SUMOBRAIN, <http://www.sumobrain.com> (last visited May 18, 2015).

¹⁷⁸ See PATENTBUDDY, <http://www.patentbuddy.com> (last visited May 18, 2015).

¹⁷⁹ See PETAPATOR/ASPATOR, <http://petapator.com> (last visited May 18, 2015).

¹⁸⁰ See Wang, *supra* note 108, at 167–68 (discussing how brokers as an intermediary group assist the market by removing information asymmetry and by creating a more consistent system for valuation of assets).

¹⁸¹ See Jackie Hutter, *Free and Low Cost Patent Search and Analysis Tools: Who Needs Expensive Name Brand Products?*, IP ASSET MAXIMIZER BLOG (June 18, 2013), <http://ipassetmaximizerblog.com/free-and-low-cost-patent-search-and-analysis-tools-who-needs-expensive-name-brand-products>.

¹⁸² See Christopher Flagg, *There's a Fly in My Soup: Hand-Crafted Research in the Age of Analytics*, WORLD INTELL. PROP. REV. (Jan. 9, 2013), <http://www.worldipreview.com/article/there-s-a-fly-in-my-soup-hand-crafted-reserach-in-the-age-of-analytics>.

¹⁸³ See LEX MACHINA, <https://lexmachina.com> (last visited May 18, 2015).

¹⁸⁴ See IPVISION, <http://ipvis.com> (last visited May 18, 2015).

¹⁸⁵ See IP CAPITAL GROUP, <http://www.ipcg.com> (last visited May 18, 2015).

¹⁸⁶ See EVALUESERVE, <http://www.evalueserve.com> (last visited May 18, 2015).

¹⁸⁷ See RED OAK IP, <http://redoakip.com> (last visited May 18, 2015).

¹⁸⁸ See OCEAN TOMO, <http://www.oceantomo.com> (last visited May 18, 2015).

Red Chalk Group, LLC¹⁸⁹
TAEUS¹⁹⁰
IPGenix¹⁹¹
Black Stone IP¹⁹²
Chipworks¹⁹³
3LP Advisors¹⁹⁴
284 Partners¹⁹⁵
Questel¹⁹⁶

The services provided by these firms include patent search, prior art search, infringement analysis, product teardowns and reverse-engineering, and patent valuation.¹⁹⁷ Acting as an extension of the in-house IP strategy role, these companies provide services that help a company identify IP risk and value and better understand the probabilities presented by that risk and value. This information has helped to inform transacting parties and, therefore, increase patent asset management.¹⁹⁸ Importantly, these services were generally not available fifteen years ago, but this services market is developing rapidly today.¹⁹⁹ As Blaxill and Eckart state:

[M]arket growth clearly encourages specialisation. But the arrow works the other way as well — increased specialisation encourages the growth of the market. This creates a virtuous cycle where the growing market drives a Smithian division of labour and increased division of labour increases the size of the market. . . . [A] wide variety of IP-focused transaction specialists have appeared — brokers, licensing companies, royalty securitisation companies, contingency finance companies, reverse engineering companies, patent data providers, patent validation companies, defensive publication companies — all focused on supporting the increased number and size of transactions.²⁰⁰

C. Speculators (NPEs) Have Entered the Market

For the purposes of this section, a speculator is defined as an entity without operations or purpose other than to make profits

189 See RED CHALK GROUP, <http://www.redchalk.com> (last visited May 18, 2015).

190 See TAEUS, <http://www.taeus.com> (last visited May 18, 2015).

191 See IPGENIX, <http://ipgenix.com> (last visited May 18, 2015).

192 See BLACK STONE IP, <http://blackstoneip.com> (last visited May 18, 2015).

193 See CHIPWORKS, <http://www.chipworks.com> (last visited May 18, 2015).

194 See 3LP, <http://3lp.com> (last visited May 18, 2015).

195 See 284 PARTNERS, <http://www.284partners.com> (last visited May 18, 2015).

196 See QUESTEL, <http://www.questel.com/index.php/en/> (last visited May 18, 2015).

197 See *supra* notes 184–196.

198 See Wang, *supra* note 108, at 165–71.

199 Of the firms listed, only TAEUS and Chipworks existed prior to 2000, both having been founded in 1992 as engineering and reverse-engineering firms, respectively.

200 Mark Blaxill & Ralph Eckardt, *The IP Marketplace Comes of Age*, INTELL. ASSET MGMT. MAG., Nov./Dec. 2011, at 46, 48.

from the monetization or trade of IP.²⁰¹ This does not include universities, research institutions, or technology companies with significant R&D and technology licensing businesses, such as Qualcomm (33% of revenue from patent monetization activities) or InterDigital (majority of revenue from patent monetization activities).²⁰² Nor does this categorization include patent brokers, licensing agents, or other intermediaries that do not take at least an interest in patent assets that would confer standing to bring a patent infringement lawsuit. This section is not focused on those for-profit entities that are innovating new business models for patent management, such as RPX,²⁰³ AST,²⁰⁴ or Unified Patents.²⁰⁵ Instead, this section is focused on the pure profit motive—the entities that participate in the trade of patents for a return on investment, whether their purchase of patents is for resale, licensing, or generation of return through litigation. These new market participants—NPEs or patent assertion entities (PAEs), however they are called—are speculators.

Speculation in the patent market is not new to the twenty-first century. However, as Michael Risch has provided:

Patents have always been licensed. Patents have always been acquired. Patents have even been acquired for the purpose of licensing new entrants. In short, there have always been secondary markets. It turns out, however, that the current trend of acquiring patents to license those already practicing the patent is a relatively recent phenomenon, one almost unique in our history.²⁰⁶

This author proposes that this phenomenon is a direct result of the specialists and resources newly available in the twenty-first century, highlighted in the last section, which provide better information about the current use and value of patents. This new focus, of course, has led to new patent

²⁰¹ An attempt to define an NPE is an entirely different matter outside the bounds and purpose of this Article. *See supra* note 161.

²⁰² *See* Qualcomm Inc., Annual Report (Form 10-K) 8 (Nov. 7, 2012), *available at* <http://files.shareholder.com/downloads/QCOM/0x0xS1234452-12-371/804328/filing.pdf>; Press Release, InterDigital Inc., InterDigital Third Quarter 2014 Financial Results Driven by 57% Increase in Recurring Revenue (Oct. 30, 2014), *available at* http://files.shareholder.com/downloads/IDCC/0x0x790056/C2F3A055-C6C8-4546-B757-E9039E097174/IDCC_News_2014_10_30_General_Releases.pdf.

²⁰³ *See* RPX, *supra* note 16.

²⁰⁴ *See* ALLIED SECURITY TRUST, *supra* note 16.

²⁰⁵ *See* UNIFIED PATENTS, <http://unifiedpatents.com> (last visited May 18, 2015).

²⁰⁶ Michael Risch, *Licensing Acquired Patents*, 21 GEO. MASON L. REV. 979, 979 (2014); *see also* Naomi R. Lamoreaux et al., *Patent Alchemy: The Market for Technology in US History*, 87 BUS. HIST. REV. 3, 4–5, 8–12, 20–22 (2013); Adam Mossoff, *The History of Patent Licensing and Secondary Markets in Patents: An Antidote to False Rhetoric*, CENTER FOR PROTECTION INTELL. PROP. (Dec. 9, 2013), <http://cpip.gmu.edu/2013/12/09/the-history-of-patent-licensing-and-secondary-markets-in-patents-an-antidote-to-false-rhetoric/>.

litigation dynamics. According to a 2013 White House report titled “Patent Assertion and U.S. Innovation,” NPE suits occur when it is too costly or risky for practicing firms to defend themselves against claims of infringement, and when certain types of patents can be exploited.²⁰⁷ Similar cases occurred involving patents for agricultural equipment and for railroad equipment in the late nineteenth century.²⁰⁸ In the case of agriculture, speculative litigation activity by non-market participants has been cited in the late 1860s when the Commissioner of Patents (with the support of Congress) issued rulings that had the effect of reducing the bar for non-obviousness.²⁰⁹ In the 1880s, the Patent Office (again supported by Congress) changed the standard back to what it had been, and suits by non-practicing patent owners fell dramatically.²¹⁰ In the case of railroad equipment, the late nineteenth century was a period of fast-moving, complex technical change, making it difficult to determine whether claims were novel and non-obvious to a skilled practitioner, giving rise to some speculative patent activity. In addition, innovators of railroad technologies preferred to focus on expanding the overall market for their products by technological cooperation with rivals, rather than working to clearly delineate property rights.²¹¹ In this case, speculative activity fell away as: (a) railroad firms banded together to fight all claims of infringement (rather than settling), and (b) patent claims became narrower and clearer, as railroad technology became more codified.²¹² A key factor in the rise of patent assertion by speculators in each of these cases was a change in law or technology that led to uncertainty about whether a patent had been infringed—for example, the granting of large numbers of patents that were broadly written or that met only a low standard of non-obviousness. In both instances, once the underlying conditions changed, NPE litigation fell dramatically because the business model was no longer

²⁰⁷ PRESIDENT’S COUNCIL OF ECON. ADVISERS, NATIONAL ECON. COUNCIL & OFFICE OF SCI. & TECH. POLICY, EXEC. OFFICE OF THE PRESIDENT, PATENT ASSERTION AND U.S. INNOVATION 6 (2013) [hereinafter WHITE HOUSE REPORT], available at http://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf.

²⁰⁸ *Id.* at 1.

²⁰⁹ *Id.* at 13.

²¹⁰ *Id.*; see also Gerard N. Magliocca, *Blackberries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 NOTRE DAME L. REV. 1809, 1812 n.15 (2007). See generally Lamoreaux et al., *supra* note 206.

²¹¹ See WHITE HOUSE REPORT, *supra* note 207, at 1.

²¹² *Id.*; see also Colleen V. Chien, Assistant Professor, Santa Clara Univ. Sch. Law, Patent Assertion Entities: Presentation to the DOJ/FTC Hearing on PAEs (Dec. 10, 2012), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2187314. See generally Steven W. Usselman & Richard R. John, *Patent Politics: Intellectual Property, the Railroad Industry, and the Problem of Monopoly*, 18 J. POL’Y HIST. 96 (2006).

profitable.²¹³ The difference between speculative patent activity in previous periods and the new speculative activity in the last fifteen years, however—and what makes the last fifteen years an evolutionary stage that will not be made insignificant by new patent legislation—is the new existence of sophisticated tools, specialists, and intermediaries to allow greater information discovery and transaction execution.

The influx of speculators to the market in the last fifteen years is representative of the evolutionary step for IP as an asset class because of its proliferation and magnitude of impact. Speculator activity in the patent market has increased dramatically in recent years.²¹⁴ In 2012, NPEs brought over 2544 lawsuits in the United States (61% of all patent suits), compared to 1509 in 2011 (45%), and 731 in 2010 (29%).²¹⁵ James Bessen and Michael Meurer have claimed that this activity has cost the economy \$29 billion in direct costs per year.²¹⁶ Interestingly, according to one source, more than 80% of the patents litigated by speculators were traded to them by operating companies.²¹⁷ This tells us that the speculative trade of IP rights is not just profitable for the speculators, but all market participants.

III. THE NEXT STEP TO ASSET CLASS STATUS: MARKETPLACES FOR EXCHANGE

Importantly, the emergence of speculators—this being the third of five evolutionary stages to tradable asset class status—is the current evolutionary stage in which the patent market finds itself. It has now moved beyond a market where assets are closely held and thinly traded. It has now seen an influx of specialists and intermediaries facilitating a greater volume of transactions. Speculators have emerged over the past decade, exploiting a private, clandestine market without a central marketplace to provide transparency and pricing mechanisms.²¹⁸

²¹³ See WHITE HOUSE REPORT, *supra* note 207, at 1.

²¹⁴ See Chien, *supra* note 212, at 23–24.

²¹⁵ *Id.*

²¹⁶ James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes* 24 (Bos. Univ. Sch. of Law, Working Paper No. 12-34, 2012), available at https://www.bu.edu/law/faculty/scholarship/workingpapers/documents/BessenJ_MeurerM062512rev062812.pdf. *But see* David L. Schwartz & Jay P. Kesan, *Analyzing the Role of Non-practicing Entities in the Patent System* 2–3 (Univ. of Ill. Coll. of Law Pub. Law & Legal Theory Research Paper Grp., Research Paper No. 13-01, 2012), available at <http://academic.reed.edu/economics/parker/f12/354/brown/Schwartz.pdf> (disputing the accuracy of Bessen and Meurer's claims).

²¹⁷ See *Companies Are Not Just Victims*, LOTNET, <http://www.lotnet.com/patent-assertion-problem/index.cfm> (last visited Feb. 13, 2015).

²¹⁸ Ian McClure, *The Value of IP as a Commodity*, INTELL. ASSET MGMT. MAG., May/June 2011, at 29, 29.

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As Part III concludes, if the development of other tradable asset classes tells us anything, a central marketplace for exchange is where the patent market is heading next.

Part II tells us that the duration of time between the emergence of specialists and the development of marketplaces for exchange for each of the equities and commodities markets was approximately one hundred years and forty years, respectively.²¹⁹ This difference can be attributed to the communication advances made between the seventeenth and the nineteenth centuries. With the major communication advances between the nineteenth and twenty-first centuries, such as the Internet, this time gap is likely to be even shorter.

As was detailed in Part I, specialists entered the patent market in the late 1990s and early 2000s. Speculators entered the patent market in the late 2000s, or about ten years after the specialists. This author predicts that the development of robust marketplaces for exchange of tradable patent rights will be complete as an evolutionary stage to asset class status before 2025. Indeed, this movement was begun by a Chicago-based marketplace, Intellectual Property Exchange International, Inc. (IPXI) which developed a financial exchange for licensing and trading patent rights beginning in 2008.²²⁰ Although it ceased operations on March 23, 2015, due to a legislative and litigation environment that proved too difficult to overcome at the time, it has paved a way for a patent marketplace to one day flourish.²²¹ As a membership-based organization with seventy-five members at its height, there is obviously an interest and demand for this evolutionary step.²²²

There is likely a growth period to build familiarity between the IP and the exchange world, as empirical evidence shows that other exchanges and new tradable products have experienced a slow build before large-scale adoption.²²³ IPXI's demise is additional evidence of the challenge in building a marketplace for a new asset class. IPXI developed the first tradable patent

²¹⁹ For the purposes of this Article, with respect to equities, it is assumed the influx of specialists occurred in the sixteenth century and marketplaces for exchange were formally developed in the early seventeenth century in Amsterdam. With respect to commodities, it is assumed the influx of specialists occurred in the 1840s and the development of commodities futures exchanges was completed in the 1880s.

²²⁰ See IPXI, FACT SHEET (2013), available at <https://www.ipxi.com/public-files/IPXI-fact-sheet.pdf>.

²²¹ Joff Wild, *IPXI Demise Caused by a US Patent System That Offers No Incentive for Good-Faith Licensing, CEO Says*, IAM (April 7, 2015), <http://www.iam-media.com/blog/detail.aspx?g=93e8d407-b24c-4d9a-a59c-da9fe9e3f578>.

²²² See Malackowski, *supra* note 1, at 37.

²²³ *Id.*

license product called a Unit License Right (ULR) contract, which was offered and sold in a manner not unlike an initial public offering of a company.²²⁴ The first tradable ULR product was issued in June 2013, which involved more than six hundred patent assets from Philips related to organic light emitting diode (OLED) technology for display screen applications.²²⁵ Additional offerings were subsequently issued, including those for patent bundles covering prepaid debit card technology and Wi-Fi technology.²²⁶ The contracts were commoditized and tradable in a secondary market through a web-based, bid-ask trading platform.²²⁷ Other entities have sprouted around the world using the term “exchange” in their title, although it is not clear that these businesses adopt a financial exchange trading model, or just an intermediary or brokerage model.²²⁸

Marketplaces purport to provide to the market for patent rights what they have provided to equities and commodities: price discovery, a real market value for assets, and transaction efficiencies.²²⁹ Without marketplaces to provide these reliable tools and benefits, the market is constrained as a private bilateral market.²³⁰ As Part II demonstrates, the problem in a private bilateral patent market is uncertainty about quality and value, and there is little predictability in patent litigation.²³¹ Yet, “[p]erhaps the most important factor that is required for the IP market to operate efficiently is predictability.”²³² The following excerpt from Blaxill and Eckardt is spot on:

When there is little uncertainty in the likely outcomes of an IP

²²⁴ See IPXI, *supra* note 220.

²²⁵ See Press Release, IPXI, IPXI Launches First Offering (June 5, 2013), *available at* <https://www.ipxi.com/news-events/news/press-releases/105-ipxi-launches-first-offering.html>.

²²⁶ See Press Release, IPXI, IPXI Announces Offerings for Stored Value Card Technology (Oct. 9, 2013), *available at* <https://www.ipxi.com/news-events/news/press-releases/119-ipxi-announces-stored-value-card-technology.html>; Press Release, IPXI, IPXI Announces Multi-Party Offering for Wireless Communications Standard Essential Patents (Oct. 1, 2014), *available at* <https://www.ipxi.com/news-events/news/press-releases/177-ipxi-announces-multi-party-offering-for-wireless-communications-standard-essential-patents.html>.

²²⁷ See *Unit License Right Purchasers*, IPXI, <https://www.ipxi.com/ulr-purchasers> (last visited Feb. 13, 2015); *see also* McClure, *supra* note 218.

²²⁸ See JINYONG CHANG, IP TECHNOLOGY TRADING – INNOVATIVE MODEL: TECHNOLOGY TRANSFER IN CHINA (2013), *available at* http://www.lesarab.org/upload/new_files/chang.pdf; *see also* HKIPX, <http://hkipx.com/en/> (last visited Feb. 13, 2015); ASIA IP EXCHANGE, http://www.asiaipex.com/Home/Index_EN (last visited Feb. 13, 2015).

²²⁹ See Fama, *supra* note 133, at 383; *see also* Leighton Vaughan Williams, *Introduction to INFORMATION EFFICIENCY IN FINANCIAL AND BETTING MARKETS* 1, 1–2 (Leighton Vaughan Williams ed., 2005), *available at* http://assets.cambridge.org/9780521816038/excerpt/9780521816038_excerpt.pdf.

²³⁰ Blaxill & Eckardt, *supra* note 200, at 48.

²³¹ Chien, *supra* note 120, at 285.

²³² Blaxill & Eckardt, *supra* note 200, at 53.

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dispute, the gap between buyer and seller expectations is small, and resolution becomes simple. But when uncertainty is high, the distribution of possible outcomes is large, and negotiated agreements become much more difficult to achieve.²³³

The history of the evolution of asset classes tells us that this time is coming soon. IPXI's growth and proof of concept has demonstrated that a robust marketplace for exchange of patent rights is practicable and there is demand for a standard course of dealing, price discovery, and tradable contracts providing opportunities for speculation to investors and predictability to operating entities. Moreover, this history tells us that the "patent troll" phenomenon that is causing a large uprising in the patent world is a necessary step to IP asset class status. It is an educational lesson on investment and speculation to the patent world, and it will in time be recognized as a period that helped grow the patent market and develop robust marketplaces for patent rights exchange.

²³³ *Id.*

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