



Bridges not Barriers:
The Law-STEM Alliance as a Catalyst for Innovation

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Intellectual Property – Featured Presentation

Irene Petrick et al., *The Challenges of Intellectual Property: Creating and Managing IP for a New Age of Innovation*, RES.-TECH. MGMT., Sept.-Oct. 2014, at 9.

W. Keith Robinson, *Protecting American Innovators by Combating the Decline of Patents Granted to Small Entities*, 88 ST. JOHN'S L. REV. 379 (2014).

PROTECTING AMERICAN INNOVATORS BY COMBATING THE DECLINE OF PATENTS GRANTED TO SMALL ENTITIES

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INTRODUCTION

“Most new jobs are created in start-ups and small businesses. So let’s pass an agenda that helps them succeed.”¹

President Barack Obama, 2012 State of the Union Address

This is a story about U.S. innovation. It begins with businesses that start in garages or basements, produce Kickstarter campaigns, and are wooed by Silicon Valley venture capitalists. Entrepreneurs and small businesses such as these drive our economy and shape our future. For example, evidence suggests that small businesses are more likely to create new and exciting technological breakthroughs.² Unfortunately, the economic environment for small businesses has been unpredictable in recent years.

Despite the fact that there is some recent evidence of recovery,³ in the last several years, the U.S. economy has struggled. In January of 2010, several economic experts predicted that the U.S. economy would not experience a “robust and sustained expansion.”⁴ A little over a month into 2010,

¹ Barack Obama, President of the U.S., Address Before a Joint Session of Congress on the State of the Union (Jan. 24, 2012), *available at* <http://www.whitehouse.gov/the-press-office/2012/01/24/remarks-president-state-union-address>.

² OFFICE OF ADVOCACY, U.S. SMALL BUS. ADMIN., THE SMALL BUSINESS ECONOMY: A REPORT TO THE PRESIDENT 191 (2005) [hereinafter THE SMALL BUSINESS ECONOMY: A REPORT TO THE PRESIDENT], *available at* http://www.sba.gov/sites/default/files/files/sb_econ2005.pdf.

³ Catherine Rampell, *Consumers Help Drive U.S. Economy to 3.2% Growth Rate*, N.Y. TIMES, May 1, 2010, at B1 (reporting that the U.S. economy has expanded for three quarters in a row but that hiring continues to lag).

⁴ Pedro Nicolaci da Costa, *U.S. Growth Prospects Deemed Bleak in New Decade*, REUTERS (Jan. 3, 2010, 6:55 PM), <http://www.reuters.com/article/idUSTRE6021LK20100103> (predicting that U.S. gross domestic product would expand less than two percent over the next ten years).

sixteen banks failed.⁵ Housing-industry professionals opined that foreclosures and a drop in housing prices would continue through the first half of 2010.⁶ In February of 2010, as the short-term outlook on jobs worsened, consumer confidence dropped to a ten-month low.⁷

The outlook for small business owners was also bleak for 2010.⁸ Small businesses continued to reduce their workforce.⁹ In addition, a report indicated that small businesses continued to cut their capital spending.¹⁰ These facts led one author to opine that small businesses were becoming “the Achilles’ heel of the U.S. recovery.”¹¹

The economic environment in the United States continues to experience slow growth. In 2013, the New York Times reported that the economy was forecasted to grow 2.4% to 3.0%.¹² The newspaper’s forecast was on the heels of the economy barely growing the last quarter of 2012.¹³ The Congressional Budget Office also predicted that economic growth would remain slow.¹⁴ Consequently, the slow growth would prevent businesses from hiring American workers, causing the unemployment rate to

⁵ Julianne Pepitone, *2010 Bank Failure Tally Now 16*, CNNMONEY (Feb. 8, 2010, 4:27 PM), http://money.cnn.com/2010/02/05/news/economy/bank_failures/index.htm.

⁶ Janet Morrissey, *Still Hunting for a Bottom in Housing*, TIME (Jan. 7, 2010), <http://content.time.com/time/business/article/0,8599,1952132,00.html> (indicating, however, that there have been mixed signs of stabilization in the housing market).

⁷ Leah Schnurr, *Wall Street Drops Along with Consumer Confidence*, REUTERS (Feb. 23, 2010, 5:01 PM), <http://www.reuters.com/article/idUSTRE61L23U20100223>.

⁸ *Dark Clouds Hang over U.S. Small Business: Survey*, REUTERS (Feb. 9, 2010, 8:30 AM), <http://www.reuters.com/article/idUSTRE6141SR20100209> (stating that the clouds hovering over small businesses since the recession that began at the end of 2007 has gotten the attention of Washington).

⁹ Michael McKee, *In This Recovery, Small Business Falls Behind*, BLOOMBERG BUSINESSWEEK (Feb. 11, 2010), http://www.businessweek.com/magazine/content/10_08/b4167016988043.htm (arguing that small businesses have been reluctant to invest in jobs, which is the area in which the economy needs the most assistance).

¹⁰ *See id.*

¹¹ *See id.*

¹² Catherine Rampell, *U.S. Economy Expanded Slightly in 4th Quarter*, N.Y. TIMES, Mar. 1, 2013, at B3 (explaining that the data is basically indistinguishable from no economic growth at all and predicting that if Congress does not avert spending cuts, economic growth will decline).

¹³ *See id.*

¹⁴ CONG. BUDGET OFFICE, THE BUDGET AND ECONOMIC OUTLOOK: FISCAL YEARS 2013 TO 2023, at 1, 4 (2013), available at <http://www.cbo.gov/sites/default/files/cbofiles/attachments/43907-BudgetOutlook.pdf> (anticipating that economic growth will remain slow in 2013).

remain near eight percent.¹⁵ Recently, some commentators suggested that the congressional budget battle and government shutdown in 2013 also harmed small businesses.¹⁶ In sum, small businesses have experienced a very murky economic climate in the past several years.

The news concerning small businesses is especially troubling because companies with fewer than five hundred employees have helped lead the economy out of the last four recessions.¹⁷ Many believe that small businesses are key drivers of technological innovation, which in turn leads to more job creation.¹⁸ Accordingly, many experts have taken an increasing interest in ways to assist small businesses in their technological pursuits through reforming the U.S. patent system.¹⁹ Some commentators believe that making key changes to the U.S. patent system will assist small businesses to innovate, which in turn will positively impact the economy.²⁰

Within the U.S. patent system, small businesses, which may qualify for small entity status—also referred to as “SMEs” (small and medium enterprises)—face their own unique set of challenges. In July of 2010, Professor Scott Shane reported that small entities accounted for a decreasing share of U.S. patents as compared to large entities—for-profit businesses with greater than five hundred employees.²¹ This decline may have been due in part to factors detailed in a 2008 study that said that start-up executives believed that the patent system was just “muddling

¹⁵ See *id.* at 4.

¹⁶ See Joyce M. Rosenberg, *What's Ahead for Small Businesses in 2014?*, NEWSDAY (Jan. 26, 2014, 4:10 PM), <http://www.newsday.com/business/what-s-ahead-for-small-businesses-in-2014-1.6844044>.

¹⁷ McKee, *supra* note 9.

¹⁸ ARTI RAI ET AL., U.S. DEP'T OF COMMERCE, PATENT REFORM: UNLEASHING INNOVATION, PROMOTING ECONOMIC GROWTH & PRODUCING HIGH-PAYING JOBS 2 (2010), available at http://www.commerce.gov/sites/default/files/documents/migrated/Patent_Reform-paper.pdf.

¹⁹ See *id.* at 1, 6–7.

²⁰ See *id.* at 1, 6.

²¹ Scott Shane, *Patents Granted to Small Entities in Decline*, SMALL BUSINESS TRENDS (July 19, 2010), <http://smallbiztrends.com/2010/07/how-smart-is-the-average-entrepreneur.html> (lamenting that the trend is probably worse than the figures show because the USPTO classifies universities and non-profits as small entities and concluding that the small entity numbers overstate the share of patents being assigned to small firms).

through.”²² In addition, the study revealed that the cost of obtaining a patent was a major obstacle to small businesses seeking to patent inventions.²³ Further, it was revealed that the motivation for small entities to obtain a patent may be different from that of large entities. Specifically, the study contended that small entities may seek patents primarily to: (1) prevent copying; (2) attract investment; and (3) enhance their reputation.²⁴

Generally, there are two overarching concerns with respect to the patent process. First, patent stakeholders are interested in the quality of the examination. To address perceived deficiencies in quality, the Leahy-Smith America Invents Act (“AIA”) called for the implementation of several examination procedures such as Post Grant Review. Since these procedures only recently took effect, there is still not enough data to determine whether they will be effective. Second, patent stakeholders are interested in the speed of patent examination. Currently, the U.S. Patent and Trademark Office (“USPTO”) offers several ways in which applicants can attempt to speed up the examination of their patent application. Commentators have given these programs mixed reviews.

One major change to U.S. patent law that could have a huge effect on small entities is the transition to a “first-to-file” system in the United States. The “first-to-file” system means that a patent’s priority date can no longer be based on the day of invention. Instead, priority is based on when a patent application is filed. In a recent article, David S. Abrams and R. Polk Wagner argue that the “first-to-file” system will have a negative impact on individual inventors.²⁵ Specifically, Abrams and Wagner explain that a similar change in the law in Canada led to a fourteen percent drop in patents granted to individual

²² See Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255, 1324 (2009).

²³ *Id.* at 1310, 1312.

²⁴ *Id.* at 1297–98.

²⁵ See David S. Abrams & R. Polk Wagner, *Poisoning the Next Apple? The America Invents Act and Individual Inventors*, 65 STAN. L. REV. 517, 517–18 (2013) (concluding that the change to “first-to-file” in the United States will result in a reduction of patents granted to individual inventors based on empirical data from Canada’s change to a “first-to-file” system where there was a significant drop in the number of patents granted to individual inventors).

inventors.²⁶ While it is too early in the process to accurately observe the impact in the United States, Abrams and Wagner's work raises interesting questions about the new patenting process.²⁷

The patent process is simply different for small entities. While numerous patent reform proposals and programs have been implemented recently, none directly address the reason why small entities patent or the unique challenges faced by small entities.²⁸ Instead of sweeping proposals that could have a disparate impact on small entities, narrow and direct proposals are needed that will specifically address as many of the concerns of small entities as possible while maintaining or increasing patent quality.

Accordingly, this Article suggests that the USPTO implement a Small Entity Prioritized Examination ("SEPE") program that would accelerate the patenting process for small business inventors. As detailed below, the proposed SEPE program addresses obstacles within the U.S. patent system that hamper small entities. Further, given the proposal's framework, the USPTO could implement the proposed SEPE program with relative ease. This Article also suggests a way in which the USPTO could evaluate the effectiveness of the SEPE program, or any special examination program, by using publicly available data in conjunction with a patent valuation model. The goal of the SEPE program and the valuation model is to provide small entities with the opportunity and data to take advantage of the U.S. patenting process.

Few scholars have considered the impact of a now defunct special status the USPTO granted to small entity applicants solely in the biotechnology field. A small entity wishing to obtain special status under this program had to show that the subject invention was a major asset and that the entity's development of the technology would be impaired if there was delay in having

²⁶ See *id.* at 522 (explaining that, once the change in Canadian law is isolated, the authors observe a fourteen percent drop in the number of applications that were granted to small inventors in Canada).

²⁷ The United States transitioned to the first inventor-to-file system on March 16, 2013.

²⁸ See *infra* Part II.

the application examined.²⁹ The ability to acquire this special status ended without much discussion or debate outside the USPTO. Given the economic climate and the importance of small entities, this Article argues for a broader version of this program to be revived. Further, this Article suggests using a patent valuation model to evaluate the effectiveness of this and similar programs.

Despite evidence that small entities make a significant contribution to U.S. innovation, there seem to be very few policies put in place to support them. Historically, commentators' proposals for reforms suggesting improvement in patent quality and examination speed have been critically flawed or fallen on deaf ears. The AIA is considered the most significant patent legislation in fifty years. However, the AIA does very little to promote small entities directly. Moreover, the special examination programs implemented by the USPTO also do little to address small entity patenting concerns.

Policymakers and commentators have put forward several proposals for patent reform to address many issues. There are so many in the literature that this Article cannot do them all justice. Instead, this Article focuses on proposals that have been put forth to solve the specific problems of patent quality and the speed of examination.³⁰ Generally, with respect to speed, the proposals discussed here seek to shorten the time it takes a patentee to obtain some patent right by significantly modifying the patent process. Similarly, many of the proposals that are directed toward quality suggest modifying the current examination procedure in significant ways. While these proposals are interesting, this Article avoids endorsing them or making similar proposals. Instead, this Article suggests small, incremental changes that can be added to the programs the USPTO has already implemented.

While several accelerated examination programs currently exist, none can be used exclusively by small entities. Instead, the programs are available to small and large entities. They are divided up by other requirements such as subject matter. In addition, some of the programs require the applicant to do a lot of

²⁹ See PATENT & TRADEMARK OFFICE, U.S. DEP'T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 708.02(XII) (8th ed. rev. 1, Feb. 2003), available at http://www.uspto.gov/web/offices/pac/mpep/old/E8R1_700.pdf.

³⁰ See *infra* Part II.

the examination legwork upfront—that is, find prior art, and so forth.³¹ While these programs are meant to address the desire of some applicants for a faster examination, this Article argues that the programs do very little to encourage small entity patenting.

The proposed examination program for small entities attempts to address small entity challenges head on.³² First, it provides small entities with an exclusive patent examination track with the goal of speeding up examination. Second, the proposed program is friendly to new applicants by limiting the number of times an applicant can use the program. Third, in contrast to other examination programs, the proposed program does not require additional information from the applicant. Finally, this Article suggests a patent valuation model for monitoring patents acquired under the proposed program.³³ The valuation model could provide valuable feedback to USPTO stakeholders regarding the effectiveness of special examination programs and provide further insight into small entity patenting behavior.

Part I of this Article discusses the current state of the U.S. patent system and reviews some of the challenges entrepreneurs and small entities face regarding patenting their inventions. Part II reviews some patent reform proposals and existing programs and discusses their impact on small entities. Part III highlights the current USPTO examination programs and discusses the effectiveness of the various programs. Part IV sets forth the proposed program, prioritizing a select number of patent applications where the inventor is an entrepreneur or small entity. The Article concludes in Part V, which suggests how patent stakeholders, including the USPTO, may use a valuation model to evaluate the long-term effectiveness of special patent prosecution initiatives that offer patentees a faster path to obtaining a patent.

It remains an open question whether allowing patentees a faster way to obtain patents is beneficial to the overall economy. However, there is evidence that for some entrepreneurs and small businesses, obtaining patents at an early stage may be beneficial to their long-term growth and competitiveness. Specifically, under the prospect theory of the patent system,

³¹ See *infra* Part III.

³² See *infra* Part IV.

³³ See *infra* Part V.

patenting provides small entities with the ability to exclude competitors from a particular market while they perfect and commercialize their products.³⁴ Since small entities typically create and patent transformational products, it follows that U.S. innovation policy should remove barriers to patenting for small entities. One small way to do that may be to help small entities obtain patents quicker. However, in conjunction with speeding up the process, U.S. innovation policy makers should also create a framework for measuring the effectiveness of such programs so that U.S. innovation policy can continue to have a real impact on the U.S. economy.

I. SMALL ENTITIES AND THE U.S. PATENT SYSTEM

A. *The U.S. Patent System*

In the United States, the USPTO is the federal agency with the authority to grant patents and register trademarks.³⁵ Chris Katopis has referred to the Patent Office as “a gatekeeper for the public’s storehouse of knowledge and the nation’s economic investment.”³⁶ In this capacity, the USPTO examines patent applications and grants patents in accordance with the requirements of the Patent Act.³⁷ Naturally, the USPTO has a number of supporters and detractors. The most common complaints leveled against the patent office relate to: (1) the application backlog; (2) patent quality; (3) the cost; and (4) internal administrative matters such as technology infrastructure or employee morale.³⁸

According to the USPTO’s Data Visualization Center, as of September 2014, it takes the USPTO about eighteen to nineteen months from the date an application is filed to issue a first office action.³⁹ The average total pendency for an application is 27.4

³⁴ See Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 276 (1977).

³⁵ *The USPTO: Who We Are*, U.S. PAT. & TRADEMARK OFF., <http://www.uspto.gov/about/> (last modified July 8, 2014).

³⁶ Chris J. Katopis, *Perfect Happiness?: Game Theory as a Tool for Enhancing Patent Quality*, 10 YALE J.L. & TECH. 360, 365 (2008) (footnote omitted).

³⁷ See *id.*

³⁸ See *id.* at 369.

³⁹ See *Data Visualization Center*, U.S. PAT. & TRADEMARK OFF. (Sept. 2014), <http://www.uspto.gov/dashboards/patents/main.dashxml>.

months as of September 2014.⁴⁰ Total pendency is “the average number of months from the patent application filing date to the date the application has reached final disposition”—for example, issued as a patent or abandoned.⁴¹ Professor Kristen Osenga notes that reported patent office statistics may fail to take the discrepancies in pendency times between various technologies into account.⁴² Anecdotal reports indicate that “the time period from filing to issuance varies by technology and ranges from twenty-four to thirty-six months for chemical and mechanical arts and thirty-six to sixty months for electrical and software arts.”⁴³

In addition to delay, poor patent quality is considered a longstanding problem for the USPTO.⁴⁴ Low-quality patents are often obvious, overly broad, or unclear.⁴⁵ Further, low-quality patents hinder innovation because they can be profitably asserted against alleged infringers.⁴⁶ Litigation of this type increases costs for genuine innovators because, if sued, they must defend themselves against infringement suits based on low-quality patents.⁴⁷

Another criticism of the U.S. patent system is that it is expensive to obtain a patent.⁴⁸ One commentator has estimated that the annual cost of patent prosecution in the United States is over four billion dollars.⁴⁹ Respondents in a recent study reported that it cost them more than thirty-eight thousand dollars to acquire their most recent patent.⁵⁰ This estimate most likely includes USPTO application and filing fees, as well as attorney's fees to prepare and file the application, response to office actions, and continued prosecution to issuance or

⁴⁰ *See id.*

⁴¹ *See id.*

⁴² *See* Kristen Osenga, *Entrance Ramps, Tolls, and Express Lanes—Proposals for Decreasing Traffic Congestion in the Patent Office*, 33 FLA. ST. U. L. REV. 119, 129–30 (2005).

⁴³ *Id.* at 130.

⁴⁴ *See* Katopis, *supra* note 36, at 390.

⁴⁵ *See* RAI ET AL., *supra* note 18, at 5.

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *See, e.g.*, Mark A. Lemley, *Essay, Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1498 (2001).

⁴⁹ *Id.* at 1499.

⁵⁰ Graham et al., *supra* note 22, at 1311.

abandonment of the application.⁵¹ These obstacles exist for anyone seeking a patent and are only magnified for smaller entities.

To address some of the issues, Congress recently crafted legislation that is considered the most significant change in patent law since 1952.⁵² On September 16, 2011, President Obama signed into law the AIA.⁵³ While one goal of the AIA is to increase the speed and quality of patent examinations, one commentator has suggested that the law will have a negative impact on small entities.⁵⁴ This is in part due to the fact that small entities face unique challenges in the patenting process.⁵⁵

B. *The Patenting Behavior of Small Entities*

Under 37 C.F.R. § 1.27, a small entity is defined as a person—for example, an inventor or individual to whom an inventor has transferred some rights in the invention—a small business concern, or nonprofit organization.⁵⁶ A small business concern is defined as a firm “[w]hose number of employees, including affiliates, does not exceed 500 persons” and which has not assigned any rights in the invention to a person or concern that could not be qualified as an independent inventor, small entity, or nonprofit organization.⁵⁷ Examples of nonprofits include educational institutions and 501(c)(3) organizations.⁵⁸ In recognition of the unique challenges they face, small entities can take advantage of reduced patent fees.⁵⁹ It is likely that the fee reduction is also recognition for the unique and important role small entities play in the U.S. economy.⁶⁰

Small entities and large companies contribute to this country’s innovation economy in different ways. A chapter in the report titled “Small Firms: *Why Market-Driven Innovation Can’t*

⁵¹ Lemley, *supra* note 48, at 1499.

⁵² Hung H. Bui, *An Overview of Patent Reform Act of 2011: Navigating the Leahy-Smith America Invents Act Including Effective Dates for Patent Reform*, 93 J. PAT. & TRADEMARK OFF. SOC’Y 441, 445 (2011).

⁵³ *Id.* at 441.

⁵⁴ Abrams & Wagner, *supra* note 25, at 521.

⁵⁵ *See id.* at 520.

⁵⁶ 37 C.F.R. § 1.27(a)(1) (2014).

⁵⁷ 13 C.F.R. § 121.802.

⁵⁸ 37 C.F.R. § 1.27(a)(3)(ii)(A)–(B).

⁵⁹ 35 U.S.C. § 41(h)(1) (2012).

⁶⁰ THE SMALL BUSINESS ECONOMY: A REPORT TO THE PRESIDENT, *supra* note 2, at 184–87, 201–04.

Get Along *Without* Them,” asserts that “small enterprises have made and continue to make a critical contribution to the market economies’ unprecedented growth and innovation accomplishments.”⁶¹ To emphasize the importance of small entities, the author of the report, Professor William J. Baumol, divides inventions into two categories: revolutionary breakthroughs and cumulative incremental improvements.⁶²

Large businesses are not typically responsible for technological breakthroughs. Professor Baumol argues that even though large business enterprises contribute to the bulk of research and development spending,⁶³ they “tend to specialize in the incremental improvements and tend to avoid the risks of the unknown that the revolutionary breakthrough entails.”⁶⁴ Specifically, Baumol states that large businesses focus on “product improvement, increased reliability and enhanced user friendliness of products and the finding of new uses for those products.”⁶⁵ Accordingly, large businesses tend to be best at improving upon a technology once it has been discovered or invented.

In contrast, small businesses tend to be better at making technological discoveries or inventing new technologies. Professor Baumol asserts that “among the (rare) innovations that can be considered to be radical, a disproportionate share is provided by independent innovators and their affiliated entrepreneurs.”⁶⁶ For example, small businesses were responsible for several revolutionary breakthroughs in the twentieth century, including soft contact lenses, the microprocessor, and the zipper.⁶⁷ Professor Baumol also notes that, according to a study sponsored by the U.S. Small Business Administration, Office of Advocacy, small firms are more likely to own patents that are among the top one percent of the most

⁶¹ *Id.* at 183.

⁶² *Id.* at 184.

⁶³ *Id.* at 187.

⁶⁴ *Id.* at 185.

⁶⁵ *Id.* at 188 (stating that between 1971 and 2003, for example, the clock speed of Intel’s chips increased three million percent).

⁶⁶ *Id.* at 191.

⁶⁷ *Id.* at 185–86.

frequently cited patents than large firms.⁶⁸ Because of such accomplishments, one may conclude that entrepreneurs are an indispensable component of the engine of economic growth.⁶⁹

Despite evidence that small entities benefit U.S. innovation, a limited amount of assistance is available to inventors with respect to the patenting process.⁷⁰ Perhaps one reason is that a definitive causal link has not been established between patenting and innovation. This question is beyond the scope of this Article. Instead, this Article presumes that small entity patenting activity is at least one positive indicator of innovation. Accordingly, the next Section explores whether current USPTO programs align with the challenges small entities face.

C. *The Patenting Challenges for Small Entities*

1. Patenting Decline

Recently, much has been written about the relationship between the U.S. patent system and small entities.⁷¹ In late 2009, the Berkeley Center for Law and Technology published its findings (“the Berkeley Study”) based on a survey conducted of high-technology startup firms in the United States to determine how these companies use and are affected by the patent system.⁷² According to the Berkeley Study, startup executives believe that the patent system is just “muddling through.”⁷³ In July of 2010, Professor Scott Shane reported that small entities were accounting for a decreasing share of U.S. patents.⁷⁴ Specifically, the share of patents granted to small entities dropped from thirty percent in 1995 to twenty percent in 2009.⁷⁵ Shane pointed out that the share of patents granted to small entities that were also

⁶⁸ *Id.* at 185; CHI RESEARCH INC., SMALL SERIAL INNOVATORS: THE SMALL FIRM CONTRIBUTION TO TECHNICAL CHANGE 12 (2003), available at <http://archive.sba.gov/advo/research/rs225tot.pdf>.

⁶⁹ THE SMALL BUSINESS ECONOMY: A REPORT TO THE PRESIDENT, *supra* note 2, at 201.

⁷⁰ See *Inventors Assistance Center (IAC)*, U.S. PAT. & TRADEMARK OFF., <http://www.uspto.gov/inventors/iac/index.jsp> (last modified July 27, 2012) (summarizing public services provided by the USPTO to assist inventors).

⁷¹ See, e.g., RAI ET AL., *supra* note 18, at 7; Graham et al., *supra* note 22, at 1258; Shane, *supra* note 21.

⁷² Graham et al., *supra* note 22, at 1255, 1260.

⁷³ *Id.* at 1324.

⁷⁴ Shane, *supra* note 21.

⁷⁵ *Id.*

U.S. citizens declined from thirty-five percent in 2001 to twenty-eight percent in 2009.⁷⁶ Shane concluded that the decline in the number of patents granted to small entities should be a concern for anyone that views small businesses as important to technological innovation.⁷⁷

Several commentators have argued that there is a correlation between patenting, innovation, and a strong economy. In April of 2010, the U.S. Department of Commerce published a White Paper, titled "Patent Reform: Unleashing Innovation, Promoting Economic Growth & Producing High-Paying Jobs" ("the White Paper").⁷⁸ The White Paper asserts that technological innovation is key to stimulating economic growth—including jobs—and that innovation depends significantly on the ability of innovators to obtain patents.⁷⁹ For example, between 1990 and 2007, compensation per employee increased fifty percent in some of the most innovative industries such as computers, electronics, and chemicals.⁸⁰ Thus, one might conclude that the ability of small entities to acquire patents has a direct impact on the U.S. economy.

Small entities that are backed by venture capital can be significantly impacted by patent policy. Venture-backed firms are disproportionately responsible for innovative output in the economy.⁸¹ Patents play a key role to innovators in these fields when developing their business plans and attempting to attract investors such as venture capitalists, as well as research and development initiatives.⁸² Many venture capitalists consider patents important to their funding decisions.⁸³ "For example, in a large-scale survey conducted in 2008, 76% of startup managers reported that [venture capital] investors consider patents important to funding decisions."⁸⁴ Venture capital funding can assist a small entity by providing capital that will allow it to potentially commercialize innovative products.

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ RAI ET AL., *supra* note 18, at 1.

⁷⁹ *See id.* at 2–3.

⁸⁰ *Id.* at 3.

⁸¹ Graham et al., *supra* note 22, at 1270.

⁸² RAI ET AL., *supra* note 18, at 2–3.

⁸³ *Id.* at 3.

⁸⁴ *Id.*

Accordingly, reports suggest that small entities such as high-technology startups rely heavily on investment from venture capitalists.⁸⁵ Some evidence also indicates that venture capital investors are less willing to fund companies that hold no patents.⁸⁶ Particularly in the biotechnology field, it is important for a young company to have patents with broad claims.⁸⁷ Thus, patents play a significant role in technology entrepreneurship even though some executives interviewed by the Berkeley Study believed that patents provided a relatively weak incentive to innovate.⁸⁸ Indeed, the Berkeley Study found that patents supported several key startup activities, including “securing the necessary investment to develop and grow; increasing the odds and quality of a liquidity event, such as an acquisition or IPO; and serving strategic roles in negotiation and defending against patent infringement suits.”⁸⁹ Thus, patents that are timely and are of high quality will drive innovation; delay, uncertainty, poor quality, and inefficiencies in legal processes will stymie innovation.⁹⁰ Unfortunately, some available data suggests that the current patent system fails to provide timely and high-quality patents in a consistent fashion.⁹¹

2. Patenting Roadblocks

The cost of acquiring a patent can be a major roadblock for small entities. Among technology startups, the cost of obtaining a patent is the most common reason cited for not patenting a major technology.⁹² Respondents in the Berkeley Study reported that it cost them more than thirty-eight thousand dollars to acquire their most recent patent.⁹³ An executive interviewed during the Berkeley Study stated:

[S]tartups often pay significantly more than incumbents to their prosecuting attorneys, because startups (1) tend to file for patents on inventions that are more important to the company’s

⁸⁵ John B. Maier, II & David A. Walker, *The Role of Venture Capital in Financing Small Business*, 2 J. BUS. VENTURING 207, 208 (1987).

⁸⁶ Graham et al., *supra* note 22, at 1280.

⁸⁷ *See id.*

⁸⁸ *See id.* at 1287.

⁸⁹ *See id.*

⁹⁰ RAI ET AL., *supra* note 18, at 2.

⁹¹ *Id.* at 4.

⁹² Graham et al., *supra* note 22, at 1310.

⁹³ *See id.* at 1311.

core business model than large firms; (2) usually use outside instead of in-house counsel for patent prosecution; and (3) often have difficulty monitoring outside counsel to limit overall costs.⁹⁴

In addition to cost, delay in receiving a patent also causes problems for startups, particularly those seeking financing.⁹⁵ As of September 2014, the USPTO estimates that there is an application backlog of approximately 605,646 applications.⁹⁶ Patent delay also causes problems for potential competitors who must wait to tailor their research and development until they know what claims have been granted to an applicant.⁹⁷ Moreover, delay is an especially troublesome problem in areas with rapid technology turnover or short product life cycles such as software because delayed patents in these areas have the potential to become obsolete or worthless very quickly.⁹⁸

Obtaining and maintaining a quality patent is another challenge small entities face. The USPTO considers low-quality patents to be those that are obvious, overly broad, or unclear.⁹⁹ Low-quality patents hinder innovation due to the high cost incurred by others to defend against an assertion of patent infringement or licensing of a low-quality patent that may be invalid.¹⁰⁰ Moreover, low-quality patents discourage investment in innovation and harm the overall economy.¹⁰¹

Finally, statistics show that the odds of an applicant acquiring and maintaining a patent are low.¹⁰² On average, sixty to sixty-five percent of applications ultimately result in a patent being issued.¹⁰³ Further, once a patent is issued, there is a significant chance it will not be enforceable for its full legal term. "In fact, nearly half of all patents are abandoned for failure to

⁹⁴ *Id.* at 1311–12.

⁹⁵ RAI ET AL., *supra* note 18, at 5.

⁹⁶ See *Data Visualization Center*, *supra* note 39.

⁹⁷ See RAI ET AL., *supra* note 18, at 5.

⁹⁸ See *id.* at 6.

⁹⁹ See *id.* at 5.

¹⁰⁰ *Id.*

¹⁰¹ *Id.* at 4 (arguing that low-quality patents "undermine the potential for economic growth and job creation").

¹⁰² See Irene Troy & Raymund Werle, *Uncertainty and the Market for Patents* 14 (Max Planck Inst. for the Study of Soc'ys, MPIfG Working Paper No. 08/2, 2008), available at <http://www.mpifg.de/pu/workpap/wp08-2.pdf>.

¹⁰³ Lemley, *supra* note 48.

pay maintenance fees before the patent term is half over, and two-thirds of all patents lapse in this way before the end of their term.”¹⁰⁴

So why do cash-strapped startups agree to participate in a system with odds of success that have been compared to a lottery? A traditional rationale for seeking a patent is to obtain rights that: (1) exclude competitors from a market, or (2) can be used to obtain licensing revenue in exchange for authorized use of patented technology.¹⁰⁵ Respondents to the Berkeley Study reported that preventing others from copying their products and services was the most important reason for patenting.¹⁰⁶ However, companies also seek patent protection for several reasons that are unrelated to the rights afforded by a patent monopoly.¹⁰⁷ For some companies, patents are a shield against other infringement lawsuits.¹⁰⁸ A company’s patents may also signal that the company possesses certain desirable attributes.¹⁰⁹

For example, venture capitalists use client patents—or more likely, patent applications—as evidence that the company is well managed, is at a certain stage in development, and has defined and carved out a market niche.¹¹⁰ In contrast, “[e]stablished companies may patent out of inertia, to maintain a reputation as a market leader, or simply for the marquee value of selling a product with ‘patented technology.’”¹¹¹ According to the Berkeley Study, aside from preventing copying, (1) improving chances of securing investment, (2) improving chances and quality of a liquidity event, and (3) enhancing company reputation and product image were second in importance to respondents.¹¹² Accordingly, patents may signal valuable information about a company to potential investors.

¹⁰⁴ Osenga, *supra* note 42, at 125.

¹⁰⁵ Lemley, *supra* note 48, at 1500–01.

¹⁰⁶ Graham et al., *supra* note 22, at 1297.

¹⁰⁷ Ann Bartow, *Separating Marketing Innovation from Actual Invention: A Proposal for a New, Improved, Lighter, and Better-Tasting Form of Patent Protection*, 4 J. SMALL & EMERGING BUS. L. 1, 8–9 (2000).

¹⁰⁸ Lemley, *supra* note 48, at 1504.

¹⁰⁹ See generally Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625 (2002).

¹¹⁰ Lemley, *supra* note 48, at 1505–06.

¹¹¹ *Id.* at 1506.

¹¹² See *id.*

The perceived rationale for patenting has a direct effect on reform proposals put forth by policy makers.¹¹³ Pro-patent policy makers that believe patents stimulate innovation are in favor of immediate and strong patent protection.¹¹⁴ In contrast, policy makers who may believe that patents harm competition and the free market are in favor of limiting the cost and the burden of patents on the public by affording patents a minimum amount of protection.¹¹⁵ New reforms introduced in the AIA seem to balance these concerns.

To address delay, uncertainty, poor quality, and inefficiency within the patent system, the AIA implements two reforms for increasing the quality and timeliness of patents.¹¹⁶ The first reform grants the USPTO the authority to flexibly adjust its fees instead of relying on congressional authority to amend its fee schedules.¹¹⁷ Accordingly, the USPTO has the ability to raise fees to pay for technology and additional examiners that the patent office would then use to reduce the 605,646 application backlog.¹¹⁸

The second reform is the introduction of an enhanced post-grant review process, which the White Paper asserts will reduce the cost of patent disputes.¹¹⁹ Challenging the validity of a patent can also be cost prohibitive for a small entity.¹²⁰ Post-grant review is expected to cost significantly less than litigation; under the proposed reform, post-grant review would be resolved in one year.¹²¹ According to the most recent statistics made available by the USPTO in early 2014, only one petition for post-grant review has been filed and then was later terminated.¹²²

¹¹³ See Sean A. Pager, *Patents on a Shoestring: Making Patent Protection Work for Developing Countries*, 23 GA. ST. U. L. REV. 755, 762 (2007).

¹¹⁴ *Id.* at 762–63.

¹¹⁵ *Id.*

¹¹⁶ RAI ET AL., *supra* note 18, at 6.

¹¹⁷ *See id.*

¹¹⁸ *See id.* at 6–7.

¹¹⁹ *See id.* at 7.

¹²⁰ *See id.*

¹²¹ *See id.* at 8.

¹²² *See AIA Trial Proceedings*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/ip/boards/bpai/stats/aia_trial_proceedings.pdf (last visited Oct. 12, 2014) (showing data for AIA Trial Proceedings for fiscal years 2012 and 2013).

As is discussed in this Article, these proposals are two of several that have been put forth to solve the perceived problems with the patent system.¹²³ A common theme among the proposals discussed herein is attempting to shorten the pendency of applications while maintaining or increasing the quality of the examination.¹²⁴ While we will see that some proposals are more workable than others, none seem to directly address the unique problems of small entities.¹²⁵ Ignoring problems unique to small entities could continue to stagnate small entity patent filings, which could have a negative effect on innovation and the U.S. economy.

II. A SURVEY OF PATENT REFORM PROPOSALS

This Part discusses various patent reform proposals that have been proposed throughout the literature. These proposals attempt to address concerns over improving the quality of patents and saving time and cost in acquiring patents.¹²⁶ In addition, this Part discusses the three-track system recently proposed by the USPTO and the existing prioritized examination programs now being implemented by the USPTO.¹²⁷ This Part provides criticisms for the various proposals and, where appropriate, analyzes the proposals' impact on small entities.

A. *Proposals for Increasing Patent Quality*

1. A Commercialization Requirement

The idea of “commercialization” refers to a patentee that manufactures or sells a product that embodies an invention disclosed in the patentee’s patent. Currently, applicants do not have to commercialize their invention in order to obtain a patent.¹²⁸ However, several commentators have suggested that some sort of commercialization requirement for patent applications should be implemented and that it would increase patent quality.¹²⁹ For example, Professors Michael Abramowicz

¹²³ See *infra* Part II.

¹²⁴ See *id.*

¹²⁵ See *id.*

¹²⁶ See *infra* Part II.A–B.

¹²⁷ See *infra* Part II.B.

¹²⁸ Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 355 (2010).

¹²⁹ This proposal is interesting especially given the popularity of non-practicing entities, which generally do not commercialize their patents.

and John Duffy have proposed reviving the paper-patent doctrine.¹³⁰ Under this doctrine, the validity-bar is raised for patents that go uncommercialized.¹³¹ Another proposal suggests imposing a requirement that the applicants commercialize their invention or forfeit their rights in the patent.¹³² According to another commentator's proposal, a "commercialization" patent would possess claims limited to the product specifically disclosed in its specification and the invention would need to be practiced no later than three years after filing the application.¹³³

However, there are several objections to a commercialization requirement. Requiring patents to be commercialized is at odds with the core principles of the current U.S. patent system. Imposing a commercialization requirement "would effectively return patent law to the pre-1880 practice of submitting a working model to obtain a patent."¹³⁴ Further, a commercialization requirement "could significantly diminish *ex ante* incentives to invent and could lead to duplicated development costs."¹³⁵ Moreover, requiring a patent to be commercialized could significantly affect various patentees in disparate ways.

For example, critics of commercialization requirements have speculated that such a requirement would have a disparate impact on small entities.¹³⁶ Small entities "tend to have much smaller R & D budgets than large companies."¹³⁷ Thus, requiring commercialization of the invention that is the subject of a patent application may unduly burden the small entity.¹³⁸ Further, "[i]f, as some commentators have contended, smaller companies innovate more per R & D dollar than large ones, actual reduction to practice could reduce overall innovation."¹³⁹ Accordingly, there are strong arguments that the cost of imposing a commercialization requirement would not outweigh the benefits.

¹³⁰ Sichelman, *supra* note 128, at 391.

¹³¹ *Id.* at 391-92.

¹³² *See id.* at 394.

¹³³ *See id.* at 346.

¹³⁴ *Id.* at 392-93.

¹³⁵ *Id.* at 345.

¹³⁶ *See id.* at 393.

¹³⁷ *Id.*

¹³⁸ *See id.* at 393-94.

¹³⁹ *Id.*

2. Enhanced Examination

Some policy makers argue that the way to increase patent quality is by enhancing aspects of the application examination process. Several proposals in the literature are based on the premise that if the Examiner reviews more prior art, then the quality of her examination will be higher.¹⁴⁰ One commentator has proposed that the price of examination should vary based on the prior art references considered and argued by the Examiner.¹⁴¹ The higher the fee paid, the more extensive the search performed by the Examiner.¹⁴² Under this proposal, the patentee could pay additional fees to submit additional references with a statement of relevance in order to have those references considered by the Examiner.¹⁴³ Under this fee-based proposal, one might argue that the quality of the resultant patent may well rely on how much money an applicant was willing to spend to have the application examined. Further, there is little evidence, empirical or anecdotal, that the number of references considered by an Examiner increases the quality of a resultant patent.¹⁴⁴

Nevertheless, recent changes to patent law have made it easier for interested parties to submit prior art that they think is relevant to the Examiner. Specifically, the AIA modified the existing third-party pre-issuance submission rules to make it easier for a third party to submit prior art to the Examiner of another application.¹⁴⁵ Such a proposal lends itself to the argument that only those applications that have attracted interest from third parties will receive quality examination. Further, it is unclear how effective this proposal would be in practice since many sophisticated entities refrain from regularly reading patents and applications.¹⁴⁶

¹⁴⁰ Michael Meehan, *Increasing Certainty and Harnessing Private Information in the U.S. Patent System: A Proposal for Reform*, 2010 STAN. TECH. L. REV. 1, ¶ 30 (2010).

¹⁴¹ *See id.* ¶ 35.

¹⁴² *See id.*

¹⁴³ *See id.*

¹⁴⁴ Osenga, *supra* note 42, at 146–47.

¹⁴⁵ David W. Trilling, Recent Development, *Recognizing a Need for Reform: The Leahy-Smith America Invents Act of 2011*, 2012 U. ILL. J.L. TECH. & POL'Y 239, 248–49 (2012).

¹⁴⁶ *See id.* at 248.

Accordingly, it is not clear that a proposal focused on increasing the number of references viewed by the Examiner would have a positive impact on the patenting of small entities. A variable fee-based system presents several cost challenges.¹⁴⁷ Some of the challenges a variable fee-based system would present to small entities is discussed below in regards to the three-track proposal and accelerated examination.¹⁴⁸ Further, larger entities could take advantage of the third-party pre-issuance submission system to overburden examiners and slow prosecution of small entity patents. So, while a patent granted to a small entity under an enhanced examination procedure may improve patent quality overall, it is unclear if such a procedure will decrease the examination time of an application or if it will enhance a small entity's chances of securing investment.

B. Proposals for Reducing the Time or Cost Incurred To Obtain a Patent

1. Registration and Hybrid Examination

Some commentators believe that instituting a patent registration system or some form of hybrid registration system will reduce the time and cost of obtaining patent rights. In general, the goal of patent registration and hybrid examination proposals is to allow an applicant to register some form of pseudo-invention disclosure while affording the applicant the option to delay substantive examination until a later date.¹⁴⁹ Theoretically, this system reduces the time and cost it would take for the applicant to acquire some form of recognized right.¹⁵⁰ For example, one commentator has suggested that the United States adopt a registration system where patents are reviewed solely for compliance with procedural formalities, and determinations of validity only occur later if an infringement claim is brought.¹⁵¹ In the alternative, a similar proposal allows the patentee to request

¹⁴⁷ Letter from Susan Walthall, Acting Chief Counsel, Office of Advocacy & Kate Reichert, Assistant Chief Counsel, Office of Advocacy, to Robert A. Clarke, Deputy Dir., Office of Patent Legal Admin. (Aug. 20, 2010) [hereinafter Letter from Susan Walthall], available at <http://www.sba.gov/content/letter-dated-082010-department-commerce-patent-and-trademark-office-1>.

¹⁴⁸ *Id.*

¹⁴⁹ See Lemley, *supra* note 48, at 1527.

¹⁵⁰ See *id.* at 1526–27.

¹⁵¹ Pager, *supra* note 113, at 771.

an examination any time after the invention is registered.¹⁵² One proposal recommends a mechanism called a “primary patent” where an application would receive minimal examination and be granted as a patent but could not be enforced through litigation.¹⁵³ Instead, the primary patent could later be subject to examination in anticipation of licensing or litigation.¹⁵⁴

Granting some form of preliminary rights and delaying substantive examination could cause several problems. First, a potential patentee could threaten others with litigation based on incredibly broad and unexamined claims.¹⁵⁵ Second, a patent of this type would fail to put the public on notice of the subject matter claimed by the applicant. Third, it is unlikely that temporary injunctive relief could be quickly obtained by one asserting a registration patent in litigation. Thus, while a registration/hybrid examination system would allow an applicant to obtain some sort of official recognition quickly, such a system sacrifices quality and places the burden of ensuring quality patents primarily on enforcement mechanisms. Because of this high social cost, one can conclude that registering potentially invalid patents is not worth the benefits provided by the low barrier to entry.¹⁵⁶

It is likely that small entities would also be negatively affected by a registration/hybrid examination system. It is unclear whether a registration patent would prevent competitors from copying a product, since it would be unclear what is exactly covered by the registration patent. Further, business ventures resting on untested patents may have difficulty finding willing investors.¹⁵⁷ Finally, it is unlikely a registration patent would do much to enhance a company’s image since in most cases a registration application does not initially undergo substantive examination.¹⁵⁸

¹⁵² Lemley, *supra* note 48, at 1524, 1527.

¹⁵³ Osenga, *supra* note 42, at 141–42.

¹⁵⁴ *See id.*

¹⁵⁵ Pager, *supra* note 113, at 771.

¹⁵⁶ Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 594–95 (1999).

¹⁵⁷ Pager, *supra* note 113, at 771.

¹⁵⁸ *Id.*

2. Petty and Second Tier Patents

In order to reduce the time and expense associated with obtaining a patent, several commentators have suggested imposing some sort of petty patent or second tier patenting system in the United States.¹⁵⁹ One common argument in favor of this proposal is that similar second tier protection is available in more than sixty countries.¹⁶⁰ For example, Australia offers applicants the ability to file what is called an Innovation Patent.¹⁶¹ Petty patents are usually granted under a “relaxed obviousness standard,” are shorter in term—five to eight years—and may be granted after a very brief examination.¹⁶² One commentator has remarked that a benefit of second tier patents is that they could potentially reduce the quantity of patent validity litigation.¹⁶³

However, petty patents pose several difficult challenges. First, they fail to directly stimulate commercialization.¹⁶⁴ For example, if implemented in the United States, one commentator predicts there will be “a huge race to acquire these sorts of patents— . . . which could diminish the commercialization efforts of third parties.”¹⁶⁵ That is, the ease in which petty patents could be obtained could result in blocking innovation.¹⁶⁶ Further, it is unclear whether pursuing second tier protection in lieu of a traditional patent is financially advantageous. For example, in Australia, the cost of acquiring its Innovation Patent is not substantially less than acquiring a standard patent.¹⁶⁷

A petty patent system would most likely negatively affect small entities. While a petty patent could prevent a competitor from making, using, or selling an invention, under most proposals it could only do so for a very limited amount of time, since a petty patent has a shorter term.¹⁶⁸ Arguably, being

¹⁵⁹ See Bartow, *supra* note 107, at 13; Pager, *supra* note 113, at 802; Sichelman, *supra* note 128, at 397.

¹⁶⁰ Sichelman, *supra* note 128, at 397.

¹⁶¹ Lee A. Hollaar, *A New Look at Patent Reform*, 87 J. PAT. & TRADEMARK OFF. SOC'Y 743, 748 (2005).

¹⁶² Sichelman, *supra* note 128, at 397–98.

¹⁶³ Bartow, *supra* note 107, at 25.

¹⁶⁴ Sichelman, *supra* note 128, at 397.

¹⁶⁵ *Id.* at 398.

¹⁶⁶ Pager, *supra* note 113, at 802.

¹⁶⁷ Hollaar, *supra* note 161, at 747.

¹⁶⁸ Sichelman, *supra* note 128, at 397.

granted several petty patents could enhance an applicant's image. However, it is unclear whether investors would invest in a technology protected by a petty patent granted under a less rigorous novelty standard and only good for a limited term.

Having discussed some of the proposals in the literature, the following Parts discuss programs currently in use by the USPTO in addition to new procedures introduced by the passage of the AIA in 2011.

III. USPTO EXAMINATION PROGRAMS

Policy makers at the USPTO are aware of the desire of some applicants to speed up the examination process. The challenge is balancing examination speed and patent quality. Currently, there are two ways a patent applicant can attempt to speed up the patent examination process. An applicant may: (1) take advantage of a prioritized examination program,¹⁶⁹ or (2) petition for the application to be examined under track one accelerated examination.¹⁷⁰ The goal of both procedures is to speed up patent examination without sacrificing the quality of the examination. This Part explains these programs and their relevance to small entity applicants.

A. *Prioritized Examination*

Until recently, applicants for a patent could obtain prioritized examination for their application under the Green Technology Pilot Program or the Project Exchange Program. Currently, applicants for a patent may obtain prioritized examination for their application under one of the following existing USPTO programs: (1) the Patent Prosecution Highway Program; (2) Applicant's Age or Health; and (3) the Accelerated Examination Program.¹⁷¹ While the goal of each program is similar—a speedier examination—each program has different qualifications and procedures. Each of these programs is discussed in further detail below.

¹⁶⁹ See generally USPTO's *Prioritized Patent Examination Program FAQs*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/patents/init_events/track1_FAQS.jsp (last modified June 2, 2014).

¹⁷⁰ *Id.*

¹⁷¹ See generally Courtenay C. Brinckerhoff, *Current Options for Prioritized U.S. Examination*, PHARMAPATENTS (Oct. 14, 2010), <http://www.pharmapatentsblog.com/current-options-for-prioritized-us-examination>.

The Green Technology Pilot Program was open to “applications pertaining to environmental quality, energy conservation, development of renewable energy resources or greenhouse gas emission reduction.”¹⁷² In addition to other requirements, applications filed under the Green Technology Pilot Program were limited to three independent claims and twenty claims total, and had to be accompanied by a supporting statement.¹⁷³

The Project Exchange Program, aptly called “Dump One, Bump One,” provided an applicant with prioritized examination of a pending application if the applicant “expressly abandon[ed]” another pending application.¹⁷⁴ Under this program, it was required that “both the application to be prioritized and the application to be abandoned [be] filed before October 1, 2009.”¹⁷⁵

The Patent Prosecution Highway Program allows U.S. applicants to receive prioritized examination if they have a corresponding foreign application that has already received a favorable patentability determination.¹⁷⁶ Accordingly, this requires the applicant to have filed a patent application in a foreign country and received a determination that at least one claim in the application is patentable.¹⁷⁷ As of January 6, 2014, the USPTO launched new pilots under the Global Patent Prosecution Highway Program and IP5 Patent Prosecution Highway Program, which includes participating patent offices in countries such as Japan, Korea, Canada, Australia, Israel, Russia, Spain, and the United Kingdom.¹⁷⁸

¹⁷² *Green Technology Pilot Program*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/patents/init_events/green_tech.jsp (last modified May 7, 2012).

¹⁷³ Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,667 (Dec. 8, 2009).

¹⁷⁴ See Brinckerhoff, *supra* note 171; *Project Exchange—Patent Application Backlog Reduction Stimulus Plan*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/patents/init_events/PatentStimulusPlan.jsp (last modified June 29, 2012).

¹⁷⁵ Brinckerhoff, *supra* note 171.

¹⁷⁶ *Patent Prosecution Highway (PPH)—Fast Track Examination of Applications*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/patents/init_events/pph/index.jsp (last modified Sept. 12, 2014); Brinckerhoff, *supra* note 171.

¹⁷⁷ Brinckerhoff, *supra* note 171.

¹⁷⁸ *Patent Prosecution Highway (PPH)—Fast Track Examination of Applications*, *supra* note 176.

Under the Applicant's Age or Health program, the applicant must submit "evidence showing that the applicant is [at least] 65 years of age" or "evidence showing that the state of health of the applicant is such that he or she might not be available to assist in the prosecution of the application if it were to run its normal course, such as a doctor's certificate or other medical certificate."¹⁷⁹ This is a permanent program with no expiration date.¹⁸⁰

Finally, to participate in the Accelerated Examination Program, an applicant must take several preliminary steps.¹⁸¹ These steps include: (1) "submitting a description of the pre-examination search parameters"; (2) "submitting copies of the closest prior art references"; and (3) "submitting a detailed discussion of the closest prior art references, pointing out with particularity how the claims are patentable over the references."¹⁸² The Accelerated Examination Program is also a permanent program with no expiration date.¹⁸³

An applicant wishing to take advantage of one of these procedures faces several challenges. First, the above-described prioritized examination procedures can only be used in very specific situations and require several additional steps on the part of the applicant.¹⁸⁴ For example, the Patent Prosecution Highway Program requires the existence of previously filed applications.¹⁸⁵ Under the Applicant's Age or Health program, applicants must either meet the age requirement or prove that

¹⁷⁹ PATENT & TRADEMARK OFFICE, U.S. DEP'T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 708.02(III)–(IV) (8th ed. rev. 9, Aug. 2012) [hereinafter MPEP], available at <http://www.uspto.gov/web/offices/pac/mpep/old/e8r9/mpep-0700.pdf>.

¹⁸⁰ Brinckerhoff, *supra* note 171.

¹⁸¹ *Guidelines for Applicants Under the New Accelerated Examination Procedure*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/patents/process/file/accelerated/ae_guidelines_20140520.pdf (last visited Oct. 13, 2014); Brinckerhoff, *supra* note 171.

¹⁸² Brinckerhoff, *supra* note 171.

¹⁸³ *Id.*

¹⁸⁴ See MPEP, *supra* note 179, § 708.02; *Accelerated Examination*, U.S. PAT. & TRADEMARK OFF., <http://www.uspto.gov/patents/process/file/accelerated/index.jsp> (last modified May 20, 2014); *Green Technology Pilot Program*, *supra* note 172; *Patent Prosecution Highway (PPH)—Fast Track Examination of Applications*, *supra* note 176; *Project Exchange—Patent Application Backlog Reduction Stimulus Plan*, *supra* note 174.

¹⁸⁵ See *Patent Prosecution Highway (PPH)—Fast Track Examination of Applications*, *supra* note 176; *Project Exchange—Patent Application Backlog Reduction Stimulus Plan*, *supra* note 174.

they are in poor health.¹⁸⁶ Under the Green Technology Pilot Program, an applicant had to include a statement asserting that the invention materially enhances the quality of the environment by contributing to the restoration or maintenance of the basic life-sustaining natural elements.¹⁸⁷ Further, an applicant had to submit a statement explaining how the materiality standard is met and that the invention “materially contributes to (1) the discovery or development of renewable energy resources; (2) the more efficient utilization and conservation of energy resources; or (3) greenhouse gas emission reduction.”¹⁸⁸

Similarly, the accelerated examination procedure imposes several additional requirements on an applicant.¹⁸⁹ Specifically, the accelerated examination procedure requires the applicant to research potential prior art, and provide the patent office with the closest prior art and a detailed discussion of the closest prior art references.¹⁹⁰ Presumably, this gives the Examiner a starting point for examination, but these requirements also require significant additional preparation time on behalf of the applicant. In cases where professional services are engaged to prepare the application for accelerated examination, this high level of complexity translates into a significant increase in professional fees for preparing and filing a patent application.¹⁹¹

The prioritized examination procedures are probably even less advantageous to small entities. When considering most of the available prioritized examination procedures, the threshold requirement for all applicants is that they meet the eligibility requirements specific to the program.¹⁹² The eligibility requirements for most programs are clearly established to benefit

¹⁸⁶ See MPEP, *supra* note 179.

¹⁸⁷ Brinckerhoff, *supra* note 171.

¹⁸⁸ *Id.*

¹⁸⁹ MPEP, *supra* note 179, § 708.02(VIII).

¹⁹⁰ *Id.*

¹⁹¹ Robert D. Gunderman & John M. Hammond, *The Limited Monopoly: Faster than a Speeding Bullet*, ROCHESTER ENGINEER, Mar. 2007, at 7, available at http://www.patenteducation.com/images/200703_Limited_Monopoly_-_Accel_examination.pdf; see Dennis Crouch, *Accelerated Examination Case Study*, PATENTLY-O BLOG (Feb. 27, 2009), <http://www.patentlyo.com/patent/2009/02/accelerated-exa.html>.

¹⁹² See MPEP, *supra* note 179, § 708.02; *Accelerated Examination*, *supra* note 184; *Green Technology Pilot Program*, *supra* note 172; *Patent Prosecution Highway (PPH)—Fast Track Examination of Applications*, *supra* note 176; *Project Exchange—Patent Application Backlog Reduction Stimulus Plan*, *supra* note 174.

a specific type of applicant. For example, an applicant must be sixty-five or older or in poor health to take advantage of the Applicant's Age or Health program.¹⁹³ However, none of the prioritized examination procedures are directly tailored to a small entity.

In addition, some of the pre-examination requirements for some of the prioritized examination programs are more complex than the requirements for normal examination. For example, under the Accelerated Examination Program, applicants are required to submit the following: (1) a description of their pre-examination search parameters; (2) the closest prior art; and (3) a detailed discussion of those prior art references.¹⁹⁴ Indeed, satisfactorily meeting the pre-examination requirements is the most significant hurdle in the Accelerated Examination process. Almost twenty percent of the applications filed under this procedure are denied for not meeting the formal pre-examination requirements.¹⁹⁵ This increased complexity translates into increased cost to prepare and file an application.¹⁹⁶ Accordingly, one could argue that these cost increases probably have a disparate impact on small entities.

Finally, the possible limit imposed on the number of patent claims is a concern for small entities.¹⁹⁷ Several of the prioritized examination procedures limit the number of independent claims and total number of claims in an application.¹⁹⁸ For example, the Green Technology Pilot Program limited the number of claims to three independent claims and twenty total claims.¹⁹⁹ In high-technology industries with a substantial number of small entities, more than three independent claims and twenty claims total may be required to describe the invention properly.²⁰⁰ For small entities, this raises the question of whether a patent obtained under certain prioritized examination procedures would

¹⁹³ MPEP, *supra* note 179.

¹⁹⁴ *Id.* § 708.02(VIII); Brinckerhoff, *supra* note 171.

¹⁹⁵ *Cumulative AE Petition Status*, U.S. PAT. & TRADEMARK OFF. (Apr. 9, 2012), http://www.uspto.gov/patents/process/file/accelerated/ae_petition_status_2012apr09.pdf.

¹⁹⁶ Gunderman & Hammond, *supra* note 191; *see* Crouch, *supra* note 191.

¹⁹⁷ Letter from Susan Walthall, *supra* note 147.

¹⁹⁸ *See* Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,667 (Dec. 8, 2009); Brinckerhoff, *supra* note 171.

¹⁹⁹ Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,667.

²⁰⁰ Letter from Susan Walthall, *supra* note 147.

afford the applicant the necessary scope to exclude others from making, selling, or using their invention. Further, a limit on the number of claims could have a negative effect on the perceived value of a granted patent, since the patent could be seen as limited.

B. *The Three-Track Examination Initiative*

USPTO policy makers have recently entertained the idea of allowing applicants to choose from one of three “tracks” to prosecute their patent application. In June of 2010, the USPTO requested public comments on the new three-track examination initiative.²⁰¹ The proposal states that applicants may choose from one of three tracks of examination including: (1) prioritized examination;²⁰² (2) traditional examination;²⁰³ or (3) delayed examination.²⁰⁴ Delayed examination allows an applicant to file a patent application and elect to have it examined at some later date.²⁰⁵ The traditional examination track refers to the normal examination procedures currently being implemented by the USPTO.²⁰⁶ Finally, the prioritized examination track endeavors to speed up the patent prosecution process²⁰⁷ and requires a substantial fee.²⁰⁸

Some of the most notable features of the prioritized examination track reflect its purpose or intent. Unlike accelerated examination, applicants do not have to perform a patent search or provide any prior art analysis.²⁰⁹ Further, prioritized examination limits an application to four independent

²⁰¹ Enhanced Examination Timing Control Initiative; Notice of Public Meeting, 75 Fed. Reg. 31,763, 31,764 (June 4, 2010).

²⁰² As of February 4, 2011, the United States has decided to proceed with track I. See Changes To Implement the Prioritized Examination Track (Track I) of the Enhanced Examination Timing Control Procedures, 76 Fed. Reg. 6,369, 6,369 (Feb. 4, 2011).

²⁰³ Enhanced Examination Timing Control Initiative; Notice of Public Meeting, 75 Fed. Reg. at 31,764.

²⁰⁴ *Id.*

²⁰⁵ *Id.*

²⁰⁶ *Id.*

²⁰⁷ Press Release, U.S. Patent and Trademark Office, USPTO Proposes To Establish Three Patent Processing Tracks (June 3, 2010), available at http://www.uspto.gov/news/pr/2010/10_24.jsp.

²⁰⁸ *Id.*

²⁰⁹ Enhanced Examination Timing Control Initiative; Notice of Public Meeting, 75 Fed. Reg. at 31,765.

claims and thirty claims total.²¹⁰ Concerning timing, the USPTO's goal is to (1) issue a first office action on the merits of the application no later than four months after the application was filed, and (2) issue a final disposition of the case within twelve months.²¹¹

The USPTO believes that this proposal will reduce pendency of all applications in several ways: (1) "increased resources in Track I would result in increased output"; (2) "reuse of search and examination work done by other offices would result in greater efficiency"; (3) applicants who chose Track III because their applications were of questionable value might ultimately not pursue their application examination"; and (4) "applicants with applications first filed abroad might ultimately not pursue their application examination."²¹² For example, prioritized examination does not commence for applications based on a prior foreign-filed application "until the agency receives a copy of the search report, if any, and first office action from the foreign office as well as an appropriate reply to the foreign office action as if the foreign office action was made in the application filed in the USPTO."²¹³ Accordingly, the goal of prioritized examination is to reduce pendency times by using USPTO resources more efficiently and reducing the number of potential applicants.

Despite the projected reduction in pendency, the three-track proposal may be disadvantageous to small entities in several ways. In response to the USPTO's request for comments, the Small Business Administration ("SBA") sent a letter to the USPTO addressing "the disproportionate impact certain aspects of this proposal may have on small businesses and small independent inventors and their ability to fully utilize the potential benefits of this initiative."²¹⁴ The three-track proposal essentially requires applicants who want an expedited review of their application to pay for the cost of that review.²¹⁵ The system is based on the premise that applicants will pay an undisclosed fee to have those innovations that are most important examined

²¹⁰ *Id.*

²¹¹ See Press Release, *supra* note 207.

²¹² See *id.*

²¹³ See *id.*

²¹⁴ Letter from Susan Walthall, *supra* note 147.

²¹⁵ Amy Schatz, *Patent Fast Track Proposed*, WALL ST. J. (June 3, 2010, 12:01 AM), <http://online.wsj.com/article/SB10001424052748704515704575282951991894276.html>.

first.²¹⁶ While the USPTO did not give details about the amount of the proposed fee, indications are that the fee will be “substantial.”²¹⁷

The fee aspect of the proposal overlooks the fact that many small entities do not have the financial resources to pay substantial fees. The U.S. patent system recognized this several years ago when it discounted small entity fees by fifty percent.²¹⁸ The SBA letter stated:

[S]mall entities have expressed concern that they will be unable to utilize the benefits of the rapid examination option because of the substantial fee required to request this track option. They have expressed concern that they will be placed at a disadvantage compared to those applicants who have greater financial backing and can request rapid review.²¹⁹

“Patent-office officials say the proposed fast-track plan won’t leave small inventors behind because they already receive a 50% discount on fees.”²²⁰ However, the USPTO acknowledged that any discount on fees for small entities would depend upon the USPTO obtaining enhanced fee-setting authority from Congress.²²¹ Because the fee to enter Track I is feared by many to be prohibitive to small entities, it is uncertain whether such a proposal will do anything to encourage small entities to file patent applications.

In addition, Track II and Track III are not particularly promising for small entities. For example, the SBA expressed concern that pendency in the traditional second track would increase because resources would be diverted to Track I.²²² Thus, Track II, the default track, would become slower than the current process is now.

In addition, while the belief is that Track III will give applicants more time to determine whether their invention is commercially viable, research shows that many small entities need patents granted sooner, not later, to obtain funding.²²³

²¹⁶ *Id.*

²¹⁷ Letter from Susan Walthall, *supra* note 147.

²¹⁸ Schatz, *supra* note 215.

²¹⁹ Letter from Susan Walthall, *supra* note 147.

²²⁰ Schatz, *supra* note 215.

²²¹ Enhanced Examination Timing Control Initiative; Notice of Public Meeting, 75 Fed. Reg. 31,763, 31,765 (June 4, 2010).

²²² Letter from Susan Walthall, *supra* note 147.

²²³ *Id.*

Many developing countries allow applicants to defer examination of their application for as long as seven years.²²⁴ Delaying examination benefits the patent office by relieving it of the burden and expense of conducting examinations on deferred applications.²²⁵ One of the arguments that deferred examination favors applicants is that deferring examination allows inventors to test their invention in the marketplace before incurring the expense of patent prosecution.²²⁶ However, a deferred application awaiting examination would not assist small entities in preventing others from copying their invention.²²⁷ Further, since research suggests that many investors consider a small entity's patents before investing in that business, it is unclear whether deferring examination would provide any advantage whatsoever to small entities attempting to secure investment.²²⁸ Finally, having an application in the queue of deferred examination is likely to do nothing for small entities' reputation or standing.²²⁹

The SBA further stated that several small entities had also expressed concern about limiting the number of independent claims and the number of total claims allowed.²³⁰ In support of this concern, the SBA argued that in industries with a large number of micro-entities, a lot of claims are required to describe the parameters of the potential patent properly.²³¹ Limiting the number of claims could have a negative effect on the perceived value of a granted patent, since the patent could be seen as limited.

As can be seen from the discussion above, scholars and policy makers have introduced numerous proposals and programs designed to reduce the time and cost required to obtain a patent while attempting to enhance the quality of the resulting patent.²³² Unfortunately, many of these proposals have a disparate impact on small entities. Accordingly, the remainder of this Article suggests more direct proposals targeted specifically at small entities.

²²⁴ Pager, *supra* note 113, at 786.

²²⁵ *See id.*

²²⁶ *See id.*

²²⁷ *Id.*

²²⁸ Graham et al., *supra* note 22, at 1280.

²²⁹ *Id.* at 1298.

²³⁰ Letter from Susan Walthall, *supra* note 147.

²³¹ *See id.*

²³² *See supra* Part III.A–B.

IV. A SMALL ENTITY PRIORITIZED EXAMINATION PILOT PROGRAM

A. *Introduction*

This Article has reviewed some recent and popular proposals to reform the patent system.²³³ These proposals attempt to change the patent system to make it quicker, more cost effective, and produce higher quality patents. However, most of these proposals assume a one-size-fits-all approach or propose various options to applicants without any guidance as to which of these options will suit them best.²³⁴ Unfortunately, none of these proposals directly addresses the problems and needs of small entities in today's economy.

Accordingly, the following discussion sets forth a tailored patent reform proposal that attempts to benefit small entities. The USPTO should implement a pilot program solely targeting small entities. The goal of the pilot program would be to assist eligible patentees in acquiring a faster, high-quality examination of their applications. Both anecdotal and empirical evidence suggest that innovative small entities are important to the U.S. economy.²³⁵ Further, some small entities use their granted patents to obtain additional funding.²³⁶ Thus, acquiring, using, and enforcing patent rights could play a significant role in the success of small entities.²³⁷ The proposed program will hereinafter be referred to as Small Entity Prioritized Examination ("SEPE").

The proposed SEPE program provides for an optional prosecution track available only to small entities.²³⁸ To permit a more focused and rigorous examination, this Article suggests that the number of small entity patent applications eligible for SEPE be limited to a finite number.²³⁹ In addition, to ensure that applicants new to the patent process have a chance to participate, the number of times an applicant can be declared

²³³ See *supra* Part III.B.

²³⁴ Enhanced Examination Timing Control Initiative; Notice of Public Meeting, 75 Fed. Reg. 31,763, 31,765 (June 4, 2010).

²³⁵ McKee, *supra* note 9.

²³⁶ Graham et al., *supra* note 22, at 1259.

²³⁷ RAI ET AL., *supra* note 18, at 1.

²³⁸ Changes To Implement the Prioritized Examination Track (Track I) of the Enhanced Examination Timing Control Procedures, 76 Fed. Reg. 6,369, 6,370 (Feb. 4, 2011) (stating that only a showing that the applicant is a small entity is required).

²³⁹ See *generally* Katopis, *supra* note 36.

eligible for SEPE should also be limited.²⁴⁰ No new or additional USPTO fees should be required. Unlike the now defunct program for biotechnology small entities and other past prioritized examination policies, this Article suggests that applications pertaining to any technology area be eligible. Finally, in conjunction with the program, this Article suggests that patent data be made available to the public through a patent valuation model that analyzes the value of patents based on: (1) the importance of the patent to the applicant, and (2) the patent's market value. Using this data, USPTO stakeholders could adjust the program as needed to facilitate the patenting of high value patents. The specific aspects of the SEPE program are detailed below.

B. Small Entity Prioritized Examination

1. Eligibility

The proposed program should limit eligibility to small entities, unlike some of the reform proposals discussed above and the current USPTO prioritized examination procedures.²⁴¹ There is precedent for treating small entities differently than larger firms. First, under 35 U.S.C. § 41(h)(1), the USPTO charges small entities half the amount it charges larger firms for administrative fees.²⁴² In addition, the USPTO has implemented a prioritized examination program for small entities filing patents strictly in the biotechnology area.²⁴³ Here, limiting eligibility to small entities: (1) reduces the amount of applications that can take advantage of the program, and (2) may encourage more small entities to file patent applications. Further, because eligibility is limited to small entities, one administrative benefit of the proposal is that the USPTO could implement changes to the small entity program that would affect a small sample of applicants across all technology areas. Obtaining small entity patent data from across all the technology areas may provide useful insights into patenting activity across many different industries.

²⁴⁰ Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 123, 125 Stat. 284, 318 (2011).

²⁴¹ See *supra* Part III.A–B.

²⁴² 35 U.S.C. § 41(h)(1) (2012).

²⁴³ See MPEP, *supra* note 179, § 708.02(XII).

One critique of the proposed SEPE program argues that small entities should not be singled out and given preferential treatment.²⁴⁴ Indeed, patent traditionalists may view the segregation of patent applications in this way with hostility.²⁴⁵ In response, one need only look to the recent increase in concern and interest in small entities to understand that there is evidence that the problems of the patent system may have a disparate impact on small entities.²⁴⁶ If one accepts the premise that small entities are important to U.S. innovation, and more importantly the economy as a whole, then one may reasonably conclude that more must be done to assist small entities in patenting their inventions. Further, one could argue that the proposed program is simply rationing examination resources to effectively address a perceived deficiency and encourage innovation.

In order to fully support future innovation, the proposed program should be open to all technologies that meet the current requirements for patentability. Governments, including the United States, have in the past and still currently conduct programs that encourage patenting in specific technology sectors.²⁴⁷ For example, applicants that had inventions directed to “green” technologies could take advantage of the USPTO’s Green Technology Pilot Program. However, one commentator has argued that the government is not the best entity to select what technology area will necessarily result in the growth of the economy.²⁴⁸ Under the proposed SEPE program, the risk of incorrectly focusing on a single technology area is minimized because any technology is eligible.

²⁴⁴ Sara Tran, *Prioritizing Innovation*, 30 WIS. INT’L L.J. 499, 539 (2012).

²⁴⁵ See *Merges*, *supra* note 156, at 597–98.

²⁴⁶ See Mark D. Janis, *Second Tier Patent Protection*, 40 HARV. INT’L L.J. 151, 151 (1999); Katopis, *supra* note 36, at 399–400.

²⁴⁷ See, e.g., Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,666 (Dec. 8, 2009).

²⁴⁸ THE SMALL BUSINESS ECONOMY: A REPORT TO THE PRESIDENT, *supra* note 2, at 202.

All too often, the importance of growth for a nation’s economy has enticed governments into providing support for particular innovative projects that they favor or even to entire arenas of innovative activity that they consider the wave of the future. The trouble is that the governments have not proven too successful in the task of picking winners, that is, in selecting projects where such government funding will have the highest payoff.

Id.

Opening up the SEPE program to all technology areas will likely attract a number of applicants. Although the percentage of small entity patents has declined, the number of total applications filed each year continues to rise. In the year 2012, 542,815 applications were filed.²⁴⁹ Just ten years before that in 2002, the number of applications filed was 334,445.²⁵⁰ Accordingly, some limits must be placed on the number of applicants to keep quality high and prevent a significant backlog.

2. Selectivity

In response to backlog concerns, this Article suggests that the SEPE program limit the number of applications examined to a predetermined number per some period of time—month, quarter, year, and so forth. As one commentator has noted, a limitation of this kind permits a more focused examination of some patent applications.²⁵¹ Presumably, the proposed limitation will also lower the cost of implementing the SEPE program by limiting the number of additional examiners the USPTO may have to hire for implementation. Limiting the workload of the examiners encourages higher quality examination by not overburdening examiners. Policy makers at the USPTO are best situated to determine the optimum number of applications that should be accepted into the SEPE program per a given time period.

Another decision policy makers would have to make is how to decide which applications are accepted into the program. While selecting them at random might be interesting, the fairest way to select applications seems to be accepting applications on a first-come, first-serve basis. This is consistent with other special examination programs. Another challenge for policy makers would be how to deal with the different rate of examinations that exists among technology centers.²⁵² One solution to this problem is that the USPTO could vary the number of applications accepted by a technology center. This is somewhat similar to the procedure that was used to limit the amount of applications

²⁴⁹ *U.S. Patent Statistics Chart: Calendar Years 1963–2013*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm (last modified July 24, 2014).

²⁵⁰ *Id.*

²⁵¹ Katopis, *supra* note 36, at 363–64.

²⁵² *See id.* at 395–96.

accepted into the green technology pilot.²⁵³ The overall goal is to limit the number of SEPE applications to a finite amount. Presumably, the USPTO would be capable of providing those applications with a more focused quality examination.²⁵⁴

To further limit the application pool, the SEPE program should also limit the number of times an applicant can participate in the program. For example, an inventor *A* may have *X* number of applications accepted for processing under SEPE in a given time frame—for example, three years.²⁵⁵ After the *X*th application is accepted under the proposed program, any later filed application naming inventor *A* would be ineligible to participate in the program.

Presumably, policy makers at the USPTO would be able to determine the optimal value for *X*. Some factors they might consider when determining the number of applications allowed for a specific inventor are examiner capacity, average pendency of applications in the SEPE program, and the likelihood that the program will only be used by a select few applicants. The purpose of this procedure is to allow the program to continue to attract new applicants and ensure that the program caters to as many applicants as possible.

An additional criticism alleges that applicants could unfairly exploit the proposed SEPE program. Two factors make this possibility less likely. First, the number of invitations to participate would be limited based on inventors named on the application. Falsifying the inventorship of a patent application could have serious validity consequences.²⁵⁶ Second, the limited number of applicants invited to participate in the proposed program would not justify the effort or cost of engaging in dishonest practices. Accordingly, several safeguards exist that would prevent applicants from exploiting the SEPE program.

²⁵³ See, e.g., Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,666 (Dec. 8, 2009).

²⁵⁴ Katopis, *supra* note 36, at 368.

²⁵⁵ Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 123, 125 Stat. 284, 318 (2011).

²⁵⁶ *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1287 (Fed. Cir. 2011).

3. Flexibility

Given the expected limitations on the number of applicants that could be selected, the proposed SEPE program should be one of many options available to small entity applicants. Accordingly, normal examination and prioritized examination under one of the other existing programs would also be available to the small entity applicant.²⁵⁷ This mirrors the policy followed by other special USPTO examination programs. In addition, it provides the applicant with flexibility in choosing how they would like to prosecute their patent application.

For increased flexibility, this Article also suggests that the SEPE program provide two decision points for small entity applicants to avail themselves of prioritized examination. First, the SEPE program should provide the applicant with an option to opt in at the time of the filing of the application. Similar to other special examination programs, this could be accomplished by the applicant by filing a petition. But, unlike current prioritized examination programs, the only showing that would be needed to opt in to the SEPE program is that the applicant qualifies as a small entity.²⁵⁸ This lower requirement opens the program up to applicants across a spectrum of technologies and does not require the time investment that the New Accelerated Examination procedure does.

Second, once the applicant is notified by the USPTO that the application has been accepted into the SEPE program, the USPTO should offer the applicant a chance to opt out before the application is assigned to an Examiner. Based on reported time frames, this window could be anywhere from five to eighteen months.²⁵⁹ The purpose of this second decision point is to give applicants time to: (1) correct any informalities; (2) obtain any information that might assist them in determining whether prosecuting the application is a priority;²⁶⁰ and (3) ensure that they are committed to going through with a speedy examination procedure.

²⁵⁷ *Id.*

²⁵⁸ *See supra* Part II.B.

²⁵⁹ *Data Visualization Center, supra* note 39 (showing that the average wait time for a first office action for track I is about five months and the average wait time for a first office action following the regular procedures is about eighteen months).

²⁶⁰ *See supra* Part III.C.

However, opting out at this point should come at a price to the applicant. As detailed earlier, the proposed SEPE program limits the number of times a named inventor/applicant may petition to enter the SEPE program.²⁶¹ Similarly, the USPTO should limit the number of times applicants can withdraw their application at the second decision point. Because the proposed SEPE program is optional at more than one stage, it also provides applicants with greater flexibility in choosing how they wish to prosecute their application.

4. Cost and Quality

In addition to timing, the SEPE program also addresses the cost of obtaining a patent. Ideally, the affordability of the SEPE program will be competitive with other existing special examination programs. From the applicant perspective, since the SEPE program is optional and only requires a showing that the applicant is a small entity, it should not impose any additional fees on small entities. Accordingly, the amount of USPTO fees imposed on an application examined under the proposed program is the same as the amount of fees for a small entity application examined today.²⁶² Attorney's fees should remain competitive because the examination process and standards are the same as those currently in practice. In fact, shortening the period of time within which a complete examination of an application takes place may save the applicant money.²⁶³

However, from the USPTO's perspective, the program will most likely increase costs. A recent report estimates that the USPTO has an operating reserve of approximately \$442.3 million.²⁶⁴ Thus, the financial position of the USPTO seems healthy enough to absorb additional costs. Further, the patent valuation model, described below, will assist in collecting data

²⁶¹ Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 123, 125 Stat. 284, 318 (2011).

²⁶² 35 U.S.C. § 41(h)(1) (2012).

²⁶³ Because speed and quality are improved, one could reasonably conclude that the cost of prosecution will be reduced. This hypothesis could be tested using empirical evidence gathered during the pilot of the program.

²⁶⁴ See U.S. PATENT & TRADEMARK OFFICE, DEP'T OF COMMERCE, PERFORMANCE AND ACCOUNTABILITY REPORT: FISCAL YEAR 2013, at 75 (2013), available at <http://www.uspto.gov/about/stratplan/ar/USPTOFY2013PAR.pdf> (discussing the financial highlights for the USPTO in the 2013 fiscal year).

that will allow policy makers to quantify any benefits gained by the program. If those benefits are greater than the cost of implementing the SEPE program, then it may be wise to make it permanent, or at a minimum expand the pool of applicants.

One benefit patent stakeholders might experience from a slight increase in administrative costs is that the speed of the examination process is maintained or increased. The goal of the proposed SEPE program is to complete the examination of an application in significantly less time than is achieved by regular examination. In 2014, the average time it took to obtain final disposition on an application was 27.2 months.²⁶⁵ In some technology areas, the pendency time can be longer or shorter. For example, the average amount of time a software patent is pending can be 32.3 months or more.²⁶⁶ The newest Track I prioritized examination program has a pendency time of about five months.²⁶⁷ Reportedly, the average pendency of an application in the Green Technology Pilot Program was about twenty months.²⁶⁸ Given the examination window of these existing programs, the SEPE program should endeavor to have a similar pendency time period of anywhere from five to twenty months.

Finally, the proposed SEPE program should not negatively affect patent quality. As mentioned above, the SEPE program limits the number of applications that can be examined over a predetermined period of time.²⁶⁹ This should keep examiners' workloads manageable. Presumably, examiners will be able to perform a more focused examination, resulting in higher quality patents.²⁷⁰ In addition, the SEPE program will benefit from new procedures instituted under the AIA to increase patent quality.

²⁶⁵ *Data Visualization Center, supra* note 39 (explaining that final disposition means either that a patent was granted or the application was abandoned).

²⁶⁶ *See* U.S. PATENT & TRADEMARK OFFICE, *supra* note 264, at 190.

²⁶⁷ *Data Visualization Center, supra* note 39 (explaining that the average time an application is pending from the grant of the petition to allowance of the application is 5.1 months).

²⁶⁸ *See Pendency*, WAY BETTER PATENTS, http://www.waybetterpatents.com/green_technology/pendency.html (last visited Oct. 13, 2014) (reporting that the mean pendency time for an application in the Green Technology Pilot Program was 19.7 months).

²⁶⁹ Limiting the number of applicants invited to participate in the proposed program provides the USPTO with an opportunity to study examiner productivity in a more controlled environment.

²⁷⁰ *See* Katopis, *supra* note 36, at 390.

For example, the third-party submission program will allow interested third parties to submit prior art to an examiner that they think is relevant to a pending application.²⁷¹ In addition, newly granted patents can be challenged under the new post-grant procedures. In sum, maintaining a reasonable examination workload and the patent quality procedures under the AIA will ensure that applications granted under the SEPE program are of the same quality as those examined normally.

5. Summary

The proposed program attempts to directly address the issues small entities encounter with the patent examination process in an effort to avoid many of the criticisms leveled against other patent reform proposals.²⁷² However, even given this direct approach, several critiques of the proposed program can be anticipated. Further, even though the proposed SEPE program is uniquely tailored to small entities, it is difficult to predict whether the program will have the desired effect. That is, will more small entities apply for and subsequently be granted a patent? Will the increase in patents granted to small entities stimulate the innovation and, in turn, the economy? These questions can only be answered satisfactorily by monitoring the program during the pilot phase and closely analyzing the data that is collected. It is clear that much of the infrastructure and procedures to implement the proposed SEPE program are already in place at the USPTO.²⁷³ If implemented, at best the goals set forth above are realized. In the alternative, the USPTO has the opportunity to collect and analyze data related only to small entities. This data could be used to help the USPTO better serve small entity applicants. In sum, implementing a pilot phase of the proposed SEPE program will be beneficial to small entities and the USPTO in various ways.

The proposed SEPE program provides several additional advantages. It directly addresses the problems that exist with the speed and quality of patent prosecution. The goal of the proposed SEPE program is to complete the examination of an

²⁷¹ See 37 C.F.R. § 1.290 (2014).

²⁷² See Janis, *supra* note 246, at 180–82.

²⁷³ See generally *Prioritized Examination for Non-Provisional Utility Applications*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/aia_implementation/track-1-quickstart-guide.pdf (last visited Oct. 14, 2014).

application in significantly less time than regular examination. The SEPE proposal is purposefully flexible to allow for modification and customization. While several other conditions could be included in the proposed program, this Article sets forth specific proposals that represent the guiding principles. The common theme of these proposals is that they do not add extra burdens on the applicant that could potentially increase the cost of prosecuting the application.²⁷⁴ For example, the proposed program could be made eligible to only U.S. inventors.²⁷⁵ Another proposal, similar to that implemented in the current green technology pilot, is that the number of independent claims be limited and that the total number of claims eligible for examination also be limited.²⁷⁶ Because the proposed SEPE program is flexible, it will allow the USPTO to adapt quickly to serve the best interests of small entity applicants and ensure that patents of high quality are issued. More importantly, one hopes that the proposed program will instill in small entities new confidence in the patent system.²⁷⁷

V. EVALUATING THE EFFECTIVENESS OF PRIORITIZED EXAMINATION

Patent quality is an important initiative for the USPTO.²⁷⁸ Accordingly, simply proposing a new program without a way to determine if quality patents are being produced is not enough. Metrics should be used to determine the effectiveness of the program over time with respect to the quality of the patent that is issued. However, how the USPTO measures quality and how

²⁷⁴ Cf. Changes to Practice for Petitions in Patent Applications To Make Special and for Accelerated Examination, 71 Fed. Reg. 36,323, 36,325 (June 26, 2006) (stating that accelerated examination in the USPTO contains several requirements, such as an information disclosure statement).

²⁷⁵ See *U.S. Patent Statistics Chart: Calendar Years 1963–2013*, *supra* note 249 (stating that 50.5% of the applications filed in 2012 were of foreign origin). Accordingly, limiting the SEPE applicant pool to U.S. applications may significantly decrease the pool of eligible applications. However, there is a possibility such a policy would not be received well by foreign governments.

²⁷⁶ Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,666 (Dec. 8, 2009).

²⁷⁷ See *Merges*, *supra* note 156, at 595. In addition, the possibility of being invited to participate in the pilot program will encourage small entities to apply for patents. Again, this hypothesis could be easily tested and proven using empirical data.

²⁷⁸ See U.S. PATENT & TRADEMARK OFFICE, *supra* note 264, at 25.

the market measures quality do not necessarily align. Traditional data collected by the USPTO generally keep track of how many patents are issued each year and to whom.²⁷⁹ But, these metrics do not tell us anything about the value of the patent itself. Is the patent being commercialized? Is the technology being licensed? Are competitors designing around the patent? In order to provide some indication as to whether prioritized examination procedures are effective at granting valuable patents, there is a need for a model that captures publicly available information and presents it in a way that tells USPTO stakeholders something about the patent's potential value.

Accordingly, why not attempt to evaluate whether patents granted from specialized programs such as the proposed SEPE have acquired a measure of quality and value? This Part outlines a modified patent valuation model based on the Littmann-Hilmer and Kuckartz Innovation and Patent-Centre ("IPC") valuation tool.²⁸⁰ The objective of the valuation model is to help applicants and the patent office identify potentially valuable patents at very early stages in the patent's term. In addition to the proposed SEPE program, the valuation model could be used to evaluate any of the examination programs already in existence.

The goal of the proposed patent valuation model is to assist the USPTO and applicants in evaluating the value of granted patents. This information could help the USPTO in allocating examination resources and providing inventor assistance in technology areas that trend toward higher value. Predicting the potential future value of a patent is difficult because, in most cases, the products that will be developed based on the patent, if any, are not defined.²⁸¹ However, in some instances, patents owned by a company can be correlated with the company's profits.²⁸² Thus, relying on certain data, it may be possible to glean some insight as to how valuable a granted patent is to a patentee.

²⁷⁹ *See id.* at 189–90.

²⁸⁰ Gudrun Littmann-Hilmer & Michael Kuckartz, *SME Tailor-Designed Patent Portfolio Analysis*, WORLD PAT. INFO., 2009, at 274.

²⁸¹ *See id.* at 273.

²⁸² *See id.*

Littmann-Hilmer and Kuckartz have developed a tool for evaluating the patent portfolios of SMEs.²⁸³ This method was developed in Germany in response to a need for SMEs to be able to evaluate their patent portfolios.²⁸⁴ The evaluation method is based on a Boston Consulting Group portfolio matrix.²⁸⁵ The matrix assists analysts in evaluating products based on their relative market share and the growth in that market.²⁸⁶ Littman-Hilmer and Kuckartz built off this foundation to tailor a tool specific to evaluating patents obtained by SMEs.

The Littman-Hilmer and Kuckartz tool accounts for several challenges in evaluating a patent's value. For patents, market share is difficult to calculate, since the technology may not have been commercialized.²⁸⁷ In addition, previous evaluation methods did not consider that SMEs may only have one patent or need to evaluate one patent and not an entire portfolio.²⁸⁸ Unlike other patent portfolio evaluation techniques, the Littman-Hilmer and Kuckartz tool is based on: (1) assessing the market value of a patent,²⁸⁹ and (2) the importance of the patent to the patentee or assignee.²⁹⁰ Further, the model evaluates single patents as they are and claims to be efficient and cost effective.²⁹¹ This Article deviates from Littman-Hilmer and Kuckartz in how they determine the importance of the patent to the patentee or assignee. However, this Article adopts the methodology described by Littman-Hilmer and Kuckartz for determining the market value of a patent.

A. *Market Value*

A patent's market value is a measure of how much it is worth as an asset. Within the context of the Littman-Hilmer and Kuckartz tool, the market value of a patent is a function of a number of measurable factors. Patent-specific indicators of the market value of a patent include: (1) forward citations; (2) market coverage; (3) technological scope of protection; (4) the

²⁸³ *See id.*

²⁸⁴ *See id.*

²⁸⁵ *See id.* at 274.

²⁸⁶ *See id.*

²⁸⁷ *See id.*

²⁸⁸ *See id.*

²⁸⁹ *See id.* at 275.

²⁹⁰ *See id.* at 276.

²⁹¹ *See id.* at 277.

legal scale of protection; and (5) the international scope of backward citations.²⁹² Each factor is explained in more detail below.

Forward citations—how many times the patent is cited by others—is an indication of patent value.²⁹³ A higher value patent is generally cited more than a lower value patent.²⁹⁴ Accordingly, the IPC valuation model uses citations to calculate a patent's market value.²⁹⁵

Market coverage refers to the number of corresponding foreign patents that are associated with the patent.²⁹⁶ It has been empirically proven that broader market coverage—a larger number of corresponding foreign patents—correlates with higher patent value.²⁹⁷

Each patent is assigned to a range of predefined technology classes that relate to a technology or application embodied by the invention.²⁹⁸ The market coverage calculation assumes that the greater the market coverage of a patent, the greater its value.²⁹⁹ The more classes a patent has been assigned to, then the more value it is perceived to have.³⁰⁰

Like technological classes, the IPC valuation model also considers claims as an indicator of market value.³⁰¹ Specifically, the IPC algorithm takes into account the number of independent and dependent claims included in a patent.³⁰² The legal scope of independent claims is considered greater than the legal scope of dependent claims.³⁰³

In contrast to forward citations, the concept of backward citations refers to the number of patents that are cited either by the applicant or by the Examiner during prosecution of the patent application.³⁰⁴ Depending upon the time at which the

²⁹² See *id.* at 275.

²⁹³ See *id.*; see also Xiaojun Hu et al., *On the Definition of Forward and Backward Citation Generations*, J. INFORMETRICS, 2011, at 27–28.

²⁹⁴ Littmann-Hilmer & Kuckartz, *supra* note 280, at 275.

²⁹⁵ See *id.*

²⁹⁶ See *id.*

²⁹⁷ See *id.*

²⁹⁸ See *id.*

²⁹⁹ See *id.*

³⁰⁰ See *id.*

³⁰¹ See *id.*

³⁰² See *id.*

³⁰³ See *id.*

³⁰⁴ See *id.*

data is gathered, the number of backward citations can mean different things.³⁰⁵ For example, before the patent is granted, a long citation record may have a negative impact on the patent's value.³⁰⁶ After the patent is granted, a lengthy number of citations can be an indicator of the patent's relative strength and increased value.³⁰⁷

Given the variables discussed above, the IPC valuation tool algorithm for calculating the market value (*MV*) is:

$$MV = \frac{1}{P_1 \dots P_n} F_{P_n} (a \times MC + b \times TS + c \times LS + d \times FWD + e \times BWD)$$

where (*P*) is the patent, (*MC*) is the market coverage, (*TS*) is the technological scope, (*LS*) is the legal scale, (*FWD*) is the number of forward citations, and (*BWD*) is the number of backward citations.³⁰⁸ The variables (*a*), (*b*), (*c*), (*d*), and (*e*) represent the industry-specific weight.³⁰⁹ The resulting value is normalized so that a number of 1.0 is the mean and a number of 2.0 is the maximum.³¹⁰ This allows for patents to simply be grouped as above-average or below-average.³¹¹

The market value of a patent is the function of several factors. These factors are traditional indicators of patent strength and value. However, given a patent's market value, the valuation process is still incomplete. In order to figure out a true valuation of a patent, in addition to market value, this Article suggests that the importance of the patent to the applicant must also be taken into consideration.

B. Applicant Importance

The IPC patent valuation tool also measures the "company value" of a patent.³¹² Company value represents the importance of the patent to the company.³¹³ It is measured using the turnover or profit margin of a product covered by the patent and

³⁰⁵ See *id.*; see also Hu et al., *supra* note 293.

³⁰⁶ See Littmann-Hilmer & Kuckartz, *supra* note 280, at 275.

³⁰⁷ See *id.*

³⁰⁸ *Id.*

³⁰⁹ *Id.*

³¹⁰ *Id.*

³¹¹ *Id.*

³¹² See *id.* at 274.

³¹³ *Id.*

the research and development costs associated with a product embodying an invention.³¹⁴ Thus, an accurate value of the patent's company value would rely heavily on accurate data about how much a company spent on developing products related to the invention and the revenue it received from commercializing those products. While this data may be readily obtainable within a firm, those outside the firm, including the USPTO, cannot easily gather this data without substantial assistance from the patentees.

Accordingly, this Article suggests that policy makers should identify factors that reflect the importance of the patent to a patentee ("applicant importance") that can be easily obtained and measured. The proposed valuation model takes into account factors that can be measured during the prosecution of a patent to determine how important the application is to the applicant. The applicant importance metric presumes that the more active and timely an applicant is in the patenting process, the more important the patent is to the applicant. Obtaining empirical proof of this hypothesis is beyond the scope of this Article. However, the hypothesis is grounded in years of prosecution experience and anecdotal evidence. Accordingly, this Article identifies several measurable factors that are related to applicant activity and could be indicative of applicant importance.

The applicant importance factor is a function of several variables. Each variable is, for the most part, influenced directly by the applicant or patentee. Specifically, the applicant importance value incorporates: (1) the number of other applications filed by applicant (*AF*); (2) whether expedited examination has been requested (*EE*); (3) the number of Requests for Continuing Examination filed (*RCE*); (4) the timeliness of applicant responses (*T*); and (5) the number of examiner interviews conducted (*EI*). Thus, the applicant importance value assumes that these factors have an elevating effect on the importance of a patent to a company. Further, unlike the factors listed in the IPC tool, the proposed factors can be measured by the patent office itself without any knowledge of a company's business plans.

³¹⁴ See *id.*

The number of patent applications filed by an applicant could be a useful clue in determining how important a patent is to the applicant. Presumably, the fewer applications an applicant has filed, the more important the applicant views any pending applications. Conversely, the more applications the applicant has on file, the less important one particular application is likely to be. Further research may be needed to confirm these presumptions, if they can be confirmed at all. Accordingly, it is advisable to assign the applications filed (*AF*) value with less weight than some of the other factors.

The expedited examination factor (*EE*) indicates whether or not a patentee has requested his or her application be examined quicker than normal. This factor presumes that applicants will expedite the examination of patents that are important to them and their business objectives. Conversely, it assumes that patent applications examined through normal USPTO procedures are less important to an applicant. Policy makers should acknowledge that this factor could also be a function of the applicant's finances and interest.

During prosecution, an applicant can file an RCE after they have received a final office action.³¹⁵ A filing of an RCE indicates that the applicant wishes to continue prosecuting the application despite the fact that the applicant has received a final office action.³¹⁶ An RCE can be an indication that an applicant for a patent does not wish to give up on prosecuting the patent.

An applicant can also request an extension of time during prosecution of a patent to respond to correspondence the applicant has received from the USPTO, including office actions.³¹⁷ Whether an applicant has taken an extension of time in responding to an office action and the number of extensions taken by the applicant throughout prosecution of a patent may be an indication of applicant importance. Timely filed replies could suggest that acquiring the patent is a pressing concern for the

³¹⁵ See 37 C.F.R. § 1.114(a) (2014) (explaining that an applicant can request continued examination of a patent application that has been closed by filing a submission and a fee).

³¹⁶ See *id.* § 1.114(b) (explaining that prosecution of an application is closed if the USPTO issues a final office action).

³¹⁷ See *id.* § 1.136 (explaining that an applicant may extend the time period to reply to communications—including office actions—requiring a response within a nonstatutory or shortened statutory time period).

applicant. In the alternative, a number of administrative reasons can cause applicants to take extensions of time. Thus, the timeliness value (T) should be weighted accordingly.

Finally, the number of examiner interviews that were conducted during prosecution of an application could be an indicator of applicant importance. Examiner interviews allow applicants or their attorney to meet with the Examiner of the application.³¹⁸ Examiner interviews are viewed as helpful to both the applicant and Examiner in understanding the invention and how its claims might be structured to overcome any claim rejections. Examiner interviews are also believed to speed up prosecution of the application. For example, Track I Prioritized Examination requires the applicant to have an examiner interview.³¹⁹ However, interviews are time intensive and typically require additional preparation. Accordingly, if an application is of low priority for applicants, they may wish not to conduct an examiner interview. Conversely, if an applicant conducts an examiner interview, it could be a strong indicator of the application's importance to the applicant.

Given the above considerations, the suggested algorithm for calculating applicant importance is:

$$AI = \frac{1}{n} \sum_{i=1}^n (a \times AF + b \times EE + c \times RCE + d \times T + e \times EI)$$

The variables (a), (b), (c), (d), and (e) represent a predetermined specific weighting.³²⁰ For example, the weights could be used to emphasize that some factors may be stronger than others in determining how important a patent is to a patentee. The resulting value is normalized so that a number of 1.0 is the mean and a number of 2.0 is the maximum.³²¹ This allows for patents to simply be grouped as above-average or below-average.³²²

³¹⁸ See *id.* § 1.133 (setting forth the rules for how and when an applicant may conduct an interview with the examiner to discuss patentability of a pending application).

³¹⁹ See MPEP, *supra* note 179, § 708.02 (stating that the applicant must agree to an examiner interview when requested by the examiner).

³²⁰ See Littman-Hilmer & Kuckartz, *supra* note 280, at 275 (explaining that the variables a , b , c , d , and e are each an industry-specific weighting).

³²¹ See *id.*

³²² *Id.*

By plotting company value in conjunction with the market value calculation, the Littmann-Hilmer and Kuckartz IPC patent analysis tool suggests various strategies for exploiting the subject patent.³²³ Similarly, the following Section proposes plotting the applicant importance in conjunction with the market value calculation to realize a patent valuation based on those two factors.

C. The Proposed Patent Analysis Model

The proposed patent analysis model depicts the value of a patent using the market value and applicant importance values described above. This Section includes an explanation of how to interpret the results.

As seen below, the results of the equations for each patent can be divided into four quadrants.³²⁴ Patents that have a high market value but low applicant interest value are placed in quadrant one.³²⁵ Quadrant two patents have both a high market value and applicant interest.³²⁶ Patents in quadrant three have a low market value and low applicant interest value.³²⁷ Patents in quadrant four have a low market value but high applicant interest value.³²⁸

³²³ *Id.*

³²⁴ *Id.*

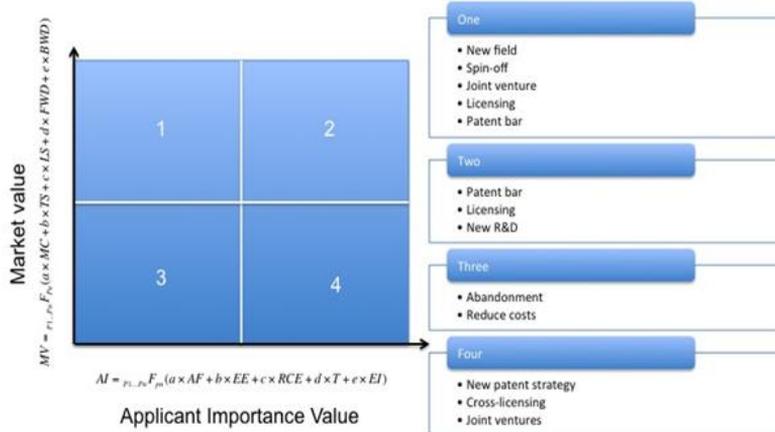
³²⁵ *Id.*

³²⁶ *Id.* at 276.

³²⁷ *Id.*

³²⁸ *Id.*

Proposed Patent Valuation Model



For each quadrant, similar to Littmann-Hilmer and Kuckartz's IPC tool, the Proposed Patent Valuation Model recommends certain strategies. For example, patents falling into quadrant one—high market value, low applicant interest value—could be exploited in numerous ways. These ways include creating new business units to exploit the technology, spinning off another company, or licensing out the technology.³²⁹ In contrast, patents that find themselves in quadrant two—high market value and high applicant interest value—are normally exploited by the company itself.³³⁰ Alternatively, the model recommends patents in quadrant three—low market value, low applicant interest value—should simply be abandoned.³³¹ Finally, the model suggests that the value of the patents in quadrant four may be overestimated.³³² Here, instead of exploiting the technology embodied by quadrant four, patent alternatives, such as patent pools, cross licensing, and joint venture opportunities, should be pursued.³³³

³²⁹ *Id.* at 275–76.

³³⁰ *Id.* at 276.

³³¹ *Id.*

³³² *Id.*

³³³ *See id.* at 277.

The method described by Littmann-Hilmer and Kuckartz has several advantages. It provided guidance to the companies that participated based on the quadrant in which the patent fell.³³⁴ One insight gained was how to differentiate between non-commercialized—blocking—patents of high and low value.³³⁵ Further, the authors found that non-technical decision makers in the company could easily understand the valuation of each patent and what that meant strategically for the company.³³⁶

In sum, the data acquired and evaluated by the Proposed Patent Valuation Model is helpful in evaluating the value of certain granted patents. More empirical study could confirm whether the strategies suggested in the IPC tool apply equally as well to patents evaluated under the Proposed Patent Valuation Model introduced here. Until that data is collected and analyzed, this Article stops short of asserting that the generic patent-portfolio strategies outlined by Littmann-Hilmer and Kuckartz would apply to a valuation based on market value and applicant importance. However, this is an area for future research and investigation.

If the Proposed Patent Valuation Model proved viable, then, in addition to the implementation of the proposed SEPE, this Article proposes that the valuation model also be implemented and made publicly available to patent stakeholders. A valuation system could accomplish two primary goals. First, it could allow the USPTO to learn which patents are of the most value in the marketplace. Second, based on the data available for similar patents, the valuation model could help patentees predict whether using certain expedited examination procedures is worth the money and help allocate their limited patenting budget in an efficient manner. Overall, the data acquired from use of the model could assist all USPTO stakeholders at various stages of the patenting process.

CONCLUSION

With respect to patent policy, small entities need direct proposals that specifically address their patenting challenges based upon what policy makers already know about: (1) small

³³⁴ *See id.*

³³⁵ *See id.*

³³⁶ *See id.*

entity patenting behavior, and (2) the long-term impact innovations developed by small firms can have on the U.S. economy. Accordingly, this Article proposes that the USPTO implement a prioritized examination program for small entities. In addition, this Article suggests that policy makers shift from using metrics that simply capture the number of patents that are granted and instead employ a patent valuation model to monitor all USPTO examination programs.

Used in conjunction with the existing USPTO quality metrics, a patent valuation model that attempts to monitor the economic impact of granted patents may provide interesting insights. First, the data may assist in our understanding of the link between patenting activity and innovation that has an impact on the U.S. economy. Second, the data could be useful to the USPTO in creating new initiatives or modifying existing prioritized examination programs for maximum effectiveness. This is a fruitful area for future empirical research, and further study is needed to determine if such a patent valuation model can assist in this process. Patents filed under the now defunct special status provision for biotechnology small entity applicants may make an effective test sample.³³⁷ Data from such a study could be useful in determining whether such a specialized program for small entities is: (1) effective at generating quality patents, and (2) addressing the patenting challenges of small entities.

In sum, current proposals and recent changes to the patent statute made by the AIA address some of the patent challenges facing entrepreneurs and small entities, but do not go far enough. The prioritized examination program for small entities, as set forth in this Article, attempts to address some of the patenting challenges facing small entities while striving to maintain patent examination quality. Given its current infrastructure, the USPTO could easily implement the program on a trial basis. While it is impossible to predict the result, the literature suggests that such a program could be useful and have a positive long-term impact on U.S. innovation.

³³⁷ See MPEP, *supra* note 179, § 708.02(XII).

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The Challenges of Intellectual Property

Creating and Managing IP for a New Age of Innovation

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The pursuit of intellectual property (IP) that can be protected through patents, copyrights, and trademarks has traditionally formed the cornerstone of many

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companies' strategies. The general rule of thumb is that IP, when it is well managed, yields sustainable competitive advantage. Recently, however, patent trolls—companies or individuals that buy up patents in bulk—have used as a weapon the very IP that was supposed to protect companies' core inventions and provide competitive advantage. Wielding their IP ownership, these trolls have blocked its application in new innovations.

The rise of patent litigation, spurred by patent trolls but also by other forces, has put pressure on companies to rethink their approach to IP. Other developments will force an even more fundamental reconsideration of the nature of IP and its place in company strategy. Three specific factors come to mind. First, the ownership of IP is morphing as its development becomes spread among a diverse set of actors in collaborative innovation arrangements. Second, the digital revolution in design and manufacturing is already reshaping the conceptualization of patents and copyrights, perhaps redefining who holds the rights to use them. And finally, all these changes—together with the increasing pace of technological change—are calling into question whether a patent or copyright can actually yield a sustainable competitive advantage at all.

Moving Forward in the Age of Open Innovation

As the complexity of technology increases and open innovation spreads, it

is becoming increasingly rare for a single company to have all the expertise and capabilities to fully create a technology platform or solution. Moreover, innovation is happening at companies of all sizes, with smaller companies often possessing the fleetness of foot to develop niche innovations more quickly and effectively than their bigger cousins. Chesbrough (2003) popularized the term *open innovation* to capture the collaborative nature of the innovation process. Collaboration between organizations attempting to solve a technical problem requires the sharing of core technical knowledge across organizational boundaries, often leading to patents or copyrights being held jointly.

After nearly a decade of open innovation, we are beginning to see new challenges and problems. Just as the dissolution of a marriage requires the allocation of assets between the divorcing parties, the dissolution of business relationships creates the need to adjudicate a complex web of IP assets. Companies have become increasingly aware of the need to plan for potential IP asset distribution, even before such assets have been created.

University research is also a strong source of technological advancement. In the past decade, the nature of the handoff between the university and the company wishing to acquire rights to the technology use has evolved. Formal licensing agreements are giving way to a more entrepreneurial approach by universities and their faculty members.

University-spawned startups are growing in popularity, and some universities are questioning whether licensing is the best way to get university IP into practical use.

InnoCentive (www.innocentive.com) recognized the power of using a globally distributed network of inventors and tinkerers to develop solutions to company problems. InnoCentive accepts problems from companies, called “seekers,” and then posts these “Challenge Problems” to its network of “solvers.” Seekers pay a fee, and solvers earn cash prizes if their solution is selected. And the IP? It goes to the seeker.

InnoCentive, and the companies that have come after it, recognized the power of the crowd long before crowdsourcing was even a popular term. Quirky (www.quirky.com) has taken crowdsourcing to new heights by offering inventors a platform to post their ideas and receive feedback from potential customers to guide the refinement of the invention. The most popular ideas then become products that are sold through the site. The influencers, while often an important source of ideas, don’t own any rights to the resulting IP. This is a radical brand of open innovation at the individual level.

So what does all of this say about the current state of open innovation? Companies in today’s world need to be very savvy about how to access and use the crowd—and other companies’ IP assets—in ways that the original patent and copyright laws didn’t necessarily envision. This is creating gaps in the case law, when past intellectual property disputes don’t match up with the new realities of truly open innovation. IP ownership, which was very clear in the days of the standalone research lab such as Xerox PARC, is much muddier today.

Creation and Ownership of IP in the Age of Digital Manufacturing

The roles of designer, producer, and customer have been well understood in the traditional supply chain. The rise of 3D printing, also called additive manufacturing, muddles those roles—and the questions around the IP embedded in any product.

Consider, for example, Shapeways (www.shapeways.com), a company that enables individuals to design, prototype, and buy or sell products online. At Shapeways, individuals can download a product design and then customize it, reload it to the Shapeways website, and have it produced by the company’s 3D printers. Shapeways then ships the finished product to the customer. So who is the designer? Is it the primary designer—the person who first posted the design—or the individual who downloaded and customized the design, or both?

Shapeways is one of the largest, but certainly not the only, service that will create physical products from digital files. And the creative landscape gets even more challenging with the advent of smartphone apps that enable a user to create digital design files from photographs of physical objects. How does the owner of the IP embedded in the original physical object even track how it is used after a digital file is created? We have seen similar problems in the entertainment sector, where digital rights management was a critical enabler of the eventual protection of intellectual property. To date, no such standards exist in the design/manufacturing space.

What is emerging is a free-for-all mentality, often driven by entrepreneurial individuals using digital technologies that obfuscate traditional IP protection. In essence, 3D manufacturing takes the challenges of open innovation and magnifies them.

Here is an example that will confound both companies and individual inventors: as we currently understand it, IP associated with physical products is protected by patents. These patents are tied to the products themselves and to their production. Digital design files break these bonds, making it difficult for companies or individual inventors to attain the true economic value of their IP. The laws that will govern this new production environment have yet to be developed or tested.

Defining Sustainable Competitive Advantage in the Digital Age

Rita Gunther McGrath (2013) argues that we have entered a period in which

the traditional linkages between strategy, innovation, and competitive advantage no longer fit the pace of change in the world. In the past, companies that invested in technology development and protected it through patents were able to attain a monopoly-like protection for a period of time, during which others could not apply that patent without compensating its owner. Although patents are still important in some sectors, in industries where the pace of change overtakes the duration of the monopoly, investments in IP and patent protection don’t yield the same long-term results.

Instead, McGrath claims, competitive advantage is becoming transient, requiring companies to rethink their strategies with a focus on being more agile and flexible: “Practices that are designed around the concept of sustainable competitive advantage . . . [and that] are designed to extract maximum value from competitive advantage become a liability when the environment requires instead the capacity to surf through waves of short-lived opportunities” (McGrath 2013, 5). Although McGrath applies her argument to all strategies within a company, its particular relevance to an innovation strategy that has IP protection as a cornerstone is evident.

The past decade has been punctuated by the stories of companies that have either reinvented themselves or withered. Think, for example, of IBM, Kodak, Blockbuster, or Garmin. No longer can executives and managers count on sustainable competitive advantage. Downes and Nunes (2014) describe these new dynamics of competition as “big bang disruptions” in which digital technologies enter traditional sectors, bringing the pace of change described by Moore’s Law into the physical world. In their view, competitive advantage in this emerging world comes through experimentation, rapid failure, and more experimentation. Nowhere does long-term IP protection guarantee market success.

Clearly, we have entered a period governed by new—and faster—competitive dynamics. Our traditional views of IP and the benefit it conveys must be questioned, and must adapt. In fact, companies that pursue traditional

beliefs about the relationship between IP and sustainable competitive advantage will face stiff—and often successful—competition from those companies and entrepreneurs that pursue the experiment-and-launch approach.

Hindsight is 20/20, and regardless of who is ultimately right from a strategy and prediction perspective, it is folly to disregard the impact that the pace of change will have on the nature and value of IP in the future.

Managing into the Future

Because case law is by nature evolving, current laws and their interpretations will be ineffective to address several emerging aspects of IP. This is certainly not a time for the faint of heart in terms of the creation, protection, or management of IP. In this issue of *Research-Technology Management*, we have gathered articles that highlight some of the current and coming challenges for executives, managers, and creators of IP. These articles address the effect of changes in IP laws and policy (Spivey, Munson, and

Wurth), in technology (Kurfess and Cass), and in IP strategies in both the private (Granstrand and Holgersson) and public (Hall et al.) sectors.

“Implications of the America Invents Act for R&D Managers,” by Spivey, Munson, and Wurth, examines the impact of recent legislation, specifically the Leahy-Smith America Invents Act, on IP-related decision making; in particular, the authors look at how the new US patent regime may require more secrecy in the development stage and a more prominent role for R&D managers in developing IP strategy. Granstrand and Holgersson investigate another evolving aspect of IP strategy, the “challenge of closing open innovation,” a discussion that is undoubtedly timely as the practice of open innovation matures and an increasing number of OI partnerships come to an end. Likewise, Hall and colleagues focus on strategic issues related to IP and the commercialization of university research; a more open and diversified approach from technology transfer office managers, the authors

suggest, is a key to leveraging IP more effectively. Finally, Kurfess and Cass examine how the recent developments in 3D printing technologies call for “Rethinking Additive Manufacturing and Intellectual Property Protection.” Indeed, they show that the wider availability of 3D printers will significantly challenge traditional forms of IP protection.

This issue is by no means exhaustive—that would probably require an entire series of handbooks!—but it does provide an overview of the critical IP issues that lie ahead.

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