March 2, 2012

Competitive Patent Law

William Hubbard

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Can U.S. patent law help U.S. businesses compete in global markets? In early 2011, President Obama argued that, to obtain economic prosperity, the United States must “out-innovate . . . the rest of the world,” and that patent reform is a “critical dimension[]” to this innovation agenda. Soon thereafter, Congress enacted the most sweeping reforms to U.S. patent law in more than half a century, contending that the changes will “give American inventors and innovators the 21st century patent system they need to compete.” Surprisingly, no legal scholar has assessed whether patent reform is capable of making the United States more competitive in global markets.

This Article begins to fill this void, arguing that traditional approaches to improving U.S. patent law, including the recent patent reform act, likely will create little domestic competitive advantage. Nevertheless, helping U.S. businesses compete in global markets is vital to our economic prosperity, as we face a crippling recession, declining innovation capacity, and increasing pressure from foreign competition. Accordingly, this Article argues that lawmakers should consider non-traditional approaches to U.S. patent law, immigration, and education to foster a culture in the United States that promotes innovation.

1 Assistant Professor, University of Baltimore Law School. For their insightful comments, I thank Colleen Chien, Greg Dolin, Richard Gruner, Dave Jaros, Gregory Mandel, Joseph Miller, Lucas Osborn, Lee Petherbridge, Kumar Sapna, Joshua Sarnoff, Ted Sichelman, Harry Surden, and Sean Tu. I also thank the participants at the 2011 Southeastern Association of Law Schools panel on Patent Law in the 21st Century, the participants at the 2011 Intellectual Property Law Scholars Conference, and the participants at the 2011 Junior Faculty Forum at the University of Baltimore Law School. I am grateful to Alyssa Brown for her excellent research assistance. This Article was produced with the support of a University of Baltimore Summer Research Fellowship.
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I. INTRODUCTION

For over a century, the United States has been one of the most innovative countries in the world.\(^2\) Our inventors pioneered the airplane,\(^3\)

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\(^2\) See, e.g., Judy Estrin, Closing the Innovation Gap: Reigniting the Spark of Creativity in a Global Economy 71 (2009) (asserting that in the 1970s the United States was technologically preeminent); Rep. Lamar Smith, Pass Patent Reform to
the electric light bulb, the polio vaccine, the transistor, the personal computer, and the internet. Indeed, in 2005, the National Council on Competitiveness, a non-partisan and non-governmental organization composed of CEOs, university presidents, and labor leaders, proclaimed that “[i]nnovation has always been deep in America’s soul.”

Recently, however, many commentators have begun to fear that America’s innovation position is starting to erode. By some measures, it
appears that the United States is not as focused on innovation as some countries.\textsuperscript{11} For example, the United States no longer hosts the fastest supercomputer in the world; that title now belongs to Japan.\textsuperscript{12} The United States does not even host the second fastest computer in the world; China does.\textsuperscript{13} Likewise, Europe, not the United States, now hosts the largest particle accelerator in the world.\textsuperscript{14} The United States is also investing less in innovation than other countries, ranking eighth in the world in spending on research and development as a percentage of GDP.\textsuperscript{15} In 2000, the United States led the world in the deployment of broadband Internet; but by 2007, the United States ranked sixteenth.\textsuperscript{16} Similarly, U.S. citizens are focusing less on careers related to innovation than citizens of many other countries. U.S. educational performance related to science and engineering is notoriously mediocre.\textsuperscript{17} “U.S. high school students underperform most of the world in international science and math tests,”\textsuperscript{18} and the United States ranks seventeenth in the world in high-school

\textit{Competitiveness}, Harv. Bus. Rev., July 2009, at 1; John C. Lechleiter, America’s Growing Innovation Gap, Wall Street Journal, July 9, 2010; \textit{see also} MICHAEL E. PORTER, \textit{THE COMPETITIVE ADVANTAGE OF NATIONS} 12 (1990) (“America, with skilled labor, preeminent scientists, and ample capital, has seen eroding export market share in industries where one would least expect it, such as machine tools, semiconductors, and sophisticated electronic products.”).

\textsuperscript{11} \textit{See also infra} notes 75 to 99 and accompanying text.

\textsuperscript{12} \textit{TOP500 List - June 2011}, TOP500.ORG, \url{http://www.top500.org/list/2011/06/100} (last visited Dec. 15, 2011).

\textsuperscript{13} \textit{Id.}


\textsuperscript{15} \textit{Key Figures: Gross domestic expenditure on R&D, % of GDP}, OECD.ORG, \url{http://www.oecd.org/dataoecd/27/52/47406944.pdf} (last visited Dec. 15, 2011). Sweden, Finland, Denmark, Switzerland, Israel, Japan, and South Korea all spend more on research and development as a percentage of GDP than the United States. \textit{Id.}

\textsuperscript{16} ESTRIN, \textit{supra} note 2, at 151.

\textsuperscript{17} AUGUSTINE, \textit{supra} note 10, at 30-34.

\textsuperscript{18} INNOVATE AMERICA, \textit{supra} note 9, at 49; \textit{see also} Staying Competitive, NAT’L MATH + SCIENCE INITIATIVE, \url{http://www.nationalmathandscience.org/solutions/challenges/staying-competitive} (last visited Dec. 15, 2011)(reporting concerning statistics regarding the performance of U.S. schools vis-à-vis foreign educational systems).
graduation rate. Student performances during college and after college are similar: the United States ranks fourteenth in the world in college graduation rate, and thirteenth in the world in doctoral graduation rates. The United States does not lead the world in the number of researchers per capita, and even U.S. companies are offshoring their research and development efforts. General Electric, a company founded by Thomas Edison, now has more research and development employees located outside of the United States than within it. General Electric is not alone. According to the National Science Foundation, almost a quarter of all research and development workers employed by U.S. companies work outside of the United States.

Unfortunately, the weakening of American innovation could not come at a worse time, as the United States struggles to overcome a crippling economic recession. Innovation and economic prosperity are closely linked in that “innovation provides the fuel for economic expansion.” Indeed, economists estimate that innovation accounts for the majority of growth in the U.S. economy. Innovation also has a significant impact on competition within global markets, and today many markets are global because “aviation and telecommunications revolutions

19 AUGUSTINE, supra note 10, at 19.
20 Id. at 19; New Doctorate Graduates, OECD ILIBRARY, http://www.oecd-ilibrary.org/sites/sti_scoreboard-2011-en/02/01/index.html?contentType=&itemId=/content/book/sti_scoreboard-2011-en&containerItemId=/content/book/sti_scoreboard-2011-en&accessItemsIds=&mimeType=text/html (last visited Jan. 4, 2012). To make matters worse, the United States ranks twenty-sixth in the world in the percentage of doctoral degrees that are awarded in science and engineering. Id.
21 INNOVATE AMERICA, supra note 9, at 49.
26 INNOVATE AMERICA, supra note 9, at 37.
27 See infra notes 49 to 50 and accompanying text.
have conspired to make distance increasingly irrelevant.”

In these global markets, domestic businesses will often lose market share to more innovative foreign competitors. As the National Academy of Science, the National Academy of Engineers, and the Institute of Medicine stated in 2010, “A nation that does not embrace innovation will soon be left behind in the 21st century economy.”

Because of the connection between innovation and domestic economic prosperity, our political leaders have argued that America should re-focus its attention on innovation to overcome its recent economic woes. Specifically, U.S. politicians contend that innovation will help U.S. businesses compete against foreign rivals and that American innovation will help the U.S. economy capture a greater share of global markets. For example, in his 2011 State of the Union Address, President Barack Obama argued: “The future is ours to win. But to get there, we can’t just stand still.” President Obama noted that other countries have made great technological progress and urged Americans to “out-innovate . . . the rest of the world.”

Patent law is a “critical” mechanism that the Obama Administration intends to use to achieve this goal. This focus is understandable because the goal of patent law is to encourage the discovery of new inventions. The innovations described by President

28 AUGUSTINE, supra note 10, at 1. As one commentator has observed, globalization has “made Boston and Bangalore next-door neighbors.” THOMAS L. FRIEDMAN & MICHAEL MANDELBACH, THAT USED TO BE US: HOW AMERICA FELL BEHIND IN THE WORLD IT INVENTED AND HOW WE CAN COME BACK 62 (2011).

29 GATHERING STORM, REVISITED, supra note 10, at 42; accord AUGUSTINE, supra note 10, at 15 (“The choice is straightforward: in the 21st century, a developed nation can either innovate or evaporate.”).


32 NAT’L ECONOMIC COUNCIL, ET AL., A STRATEGY FOR AMERICAN INNOVATION 2 (2011); see also INNOVATE AMERICA, supra note 9, at 11 (arguing that the United States must “[c]reate a 21st Century Intellectual Property Regime”).

33 By constitutional directive, patent law encourages invention by “securing for limited Times to . . . Inventors the exclusive Right to their respective . . . Discoveries.”
Obama are inventions with significant economic impact because only these inventions can create “the next big industry” and “new jobs.”

Because invention is a critical input to innovation, increasing invention may increase innovation.

Congress agreed with President Obama, and in the fall of 2011 passed the America Invents Act, which enacted the most sweeping changes to patent law since 1952. Congressional sponsors for the Act insisted that it would help Americans compete against foreign rivals. Senator Patrick Leahy claimed that the Act would “give American inventors and innovators the 21st century patent system they need to compete.” Representative Lamar Smith likewise stated that “[w]e need to modernize our patent system to maintain U.S. global competitiveness and bolster the economy.” Other members of Congress agreed that the reforms would “increase our competitiveness.” With uncommon bipartisan support in an era of bitter partisanship, the Act passed, and President Obama quickly signed it into law. In a speech the same day, Obama reiterated: “If we’re going to create jobs now and in the future,


On the other hand, some inventions may have little commercial value. See, e.g., U.S. Patent No. 6,490,999 (describing a collar for walking a snake); U.S. Patent No. 6,293,874 (describing “a user-operated and controlled apparatus for self-infliction of repetitive blows to the user's buttocks”).


President Obama claimed that “[t]his change in our patent laws is part of our agenda for making us competitive over the long term.”

In marked contrast to the claims by U.S. politicians, scholars have ignored the capacity of U.S. patent law to help U.S. inventors and companies compete against foreign counterparts. Typically, legal scholars analyze patent law from a law-and-economics perspective under which the goal of patent-law analysis is the promotion of economically efficient invention, ignoring the nationality of the inventor. Competitive concerns, such as which countries’ inventors receive patents, have received almost no attention from legal scholars. This Article seeks to

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41 Id.; see also Press Release, Office of the Press Secretary, President Obama Signs America Invents Act, Overhauling the Patent System to Stimulate Economic Growth, and Announces New Steps to Help Entrepreneurs Create Jobs (Sept. 16, 2011), http://www.whitehouse.gov/the-press-office/2011/09/16/president-obama-signs-america-invents-act-overhauling-patent-system-stim (noting that “the President’s Council on Jobs and Competitiveness . . . has been a strong advocate for patent reform as a way to support job creation and strengthen America’s competitiveness in the global economy.”).

42 “Patent law” is a vague and ambiguous term. Under a broad reading, “patent law” includes all laws related to patents. Under such a broad reading, “patent law” would include a provision of the tax code allowing an inventor to deduct costs related to obtaining a patent. Under a broad reading, “patent law” would also include laws related to the ownership of patents produced using funding from the U.S. government. See 35 U.S.C. §§ 200-212. Under a narrower interpretation, however, patent law includes only the laws related to the availability, scope, and enforcement of exclusive rights created by patents. This Article uses this narrower meaning of “patent law.”

43 Robert C. Bird, Law, Strategy, and Competitive Advantage, 44 CONN. L. REV. 61, 64 (2011) (“[T]he notion that law may be a source of competitive advantage remains largely unexplored.”).


45 In the few instances in which scholars have analyzed distributive concerns, the focus is on distributive justice. For example, scholars have examined the impact of
fill this void by considering the effects of U.S. patent law on global competition.46

This Article makes three important contributions to the scholarship regarding both patent law and global competition. First, it applies competition analysis to patent law, highlighting the importance of competitive considerations in an increasingly global economy. Second, this Article evaluates the capacity of U.S. patent law to enhance U.S. competitiveness. Specifically, it evaluates whether patent law can use three mechanisms to create domestic competitive advantage: (1) protectionist patent laws, (2) patent laws that improve the processing of patent applications by the U.S. Patent Office, and (3) patent laws that support a culture in the United States that fosters innovation. The Article uses these evaluations to assess the capacity of the recent America Invents Act to boost U.S. competitiveness, and concludes that the law likely will have only a limited impact on U.S. competitiveness. Finally, by identifying the limitations of U.S. patent law in fostering domestic competitive advantage, the Article highlights the importance of considering alternate sources of competitive advantage.

This Article contains six parts. Following this Introduction, Part II assesses whether the United States must “out-innovate every other country on Earth”47 in order to obtain economic prosperity and examines the current innovation capacity of the United States vis-à-vis other countries. This Part concludes that relative levels of innovation between the United

46 Conversely, non-legal commentators focusing on competition issues have occasionally asserted that patent law is important to U.S. economic prosperity but have not analyzed whether U.S. patent law can help U.S. inventors be more productive than their foreign counterparts. See, e.g., AUGUSTINE, supra note 10, at 67; ESTRIN, supra note 2, at 171 (asserting that the U.S. patent system should be reformed), KAO, supra note 10, at 232 (same), INNOVATE AMERICA, supra note 9, at 68-70 (same); NAT’L ECONOMIC COUNCIL, ET AL, supra note 32, at 8 (same); GATHERING STORM, REVISITED, supra note 10, at 57 (same).

States and other countries are important to U.S. economic prosperity and that the United States capacity to innovate likely has diminished compared to other countries. Part III analyzes whether protectionist patent law can boost U.S. innovation and concludes that this approach should be avoided because it would ultimately undermine U.S. innovation and prosperity. Part IV examines whether U.S. patent law can provide U.S. inventors and businesses with competitive advantages in innovating by improving the processing of patent applications by the U.S. Patent Office. This Part concludes that typical approaches to improving patent examination, like the America Invents Act, will have little effect on U.S. competitiveness. Part V examines whether U.S. patent law can increase U.S. competitiveness through a less traditional use of law: using patent law to promote social norms and values among Americans that contribute to innovation. This Part concludes that the expressive impact of patent law may help to create competitive advantage but the magnitude of this effect is unclear. Part VI concludes by summarizing and by identifying additional avenues for research. In particular, given the obstacles to using U.S. patent law to create competitive advantage, other areas of law may be better tools for helping U.S. companies and inventors compete in a global marketplace.

II. U.S. INNOVATION AND THE U.S. ECONOMY

A. The Importance of Out-Innovating the World

Innovation is unquestionably vital to the American economy. The U.S. Department of Commerce estimates that innovation produced 75% of the growth in the U.S. economy since World War II. Similarly, economists contend that as much as 80% of growth in the gross domestic

48 Here, “innovation” is defined broadly “to include both improvements in technology and better methods or ways of doing things.” See PORTER, supra note 10, at 45.

49 ARTI RAI ET AL., U.S. DEP’T OF COMMERCE, PATENT REFORM: UNLEASHING INNOVATION, PROMOTING ECONOMIC GROWTH & PRODUCING HIGH-PAYING JOBS 2 (2010). Other estimates are lower, but still significant. See, e.g., INNOVATE AMERICA, supra note 9, at 36 (stating that “economists estimate [that innovation] has accounted for half of U.S. GDP growth over the past 50 years”); see also ESTRIN, supra note 2, at 142 (“The growth of the U.S. economy has become dependent on the small, innovative companies that have thrived for decades in places like Silicon Valley.”).
economy stems from the introduction of new technologies. But is President Obama correct that the United States must “out-innovate . . . the rest of the world”?  

In one sense, President Obama may be overstating the importance of superlative innovation. Countries that “out-innovate” the United States may enjoy greater economic growth than the United States, but second-rate economic growth may still be significant. Moreover, the United States may gain from economic prosperity in foreign countries. U.S. consumers “may benefit from lower import prices and a greater variety of imports,” and U.S. citizens may be able to invest in foreign companies. “Similarly, a prosperous world will provide more potential customers for US products and cheaper and more diverse products for US consumers.” However, two considerations indicate that President Obama may be correct that superlative domestic innovation is important to the United States.


ESTRIN, supra note 2, at 155 (asserting that global economic growth will promote U.S. economic prosperity); FRIEDMAN, supra note 28, at 29 (“What goes around, comes around.”); KAO, supra note 10, at 242 (similar); PORTER, supra note 10, at 30.


See, e.g., FRIEDMAN, supra note 28, at 28-29 (discussing U.S. investment in companies in India).

AUGUSTINE, supra note 10, at 20.
First, innovation affects the capacity of domestic companies to compete successfully against foreign rivals. \(^{55}\) “Prosperity is not necessarily a zero-sum game, but there will inevitably be winners and losers.” \(^{56}\) As more markets become global, domestic businesses face greater pressure from foreign competition. \(^{58}\) “[F]irms gain and sustain competitive advantage in international competition through improvement, innovation, and upgrading.” \(^{59}\) This process of improving goods and services is on-going because the advantages of today’s products are superseded by tomorrow’s innovations. \(^{60}\) Recent experience in the music industry illustrates the importance of innovation. Few people today buy vinyl records, \(^{61}\) and even compact discs sales are declining as online sales of music have increased. \(^{62}\) A music company that fails to adjust to these technological changes cannot compete. More generally, U.S. companies must innovate in global markets, or they will lose market share. \(^{63}\)

\(^{55}\) Admittedly, it is difficult to clearly identify which businesses are “U.S. businesses.” See id. at 26; Pisano & Shih, supra note 10, at 8. Some businesses may be located in the United States but owned by foreign investors. Augustine, supra note 10, at 27. For simplicity, “U.S. business” in this Article refers to a business that contributes to U.S. gross domestic product. Such businesses are likely to employ U.S. citizens and pay U.S. taxes. Pisano & Shih, supra note 10, at 8. There may, however, be particularly significant economic benefits to a country when a foreign business locates its headquarters in that country. Porter, supra note 10, at 69-70 (“The home base is where strategy is set, core products and process development takes place, and the essential and proprietary skills reside.”).

\(^{56}\) Augustine, supra note 10, at 20.

\(^{57}\) Id. at 20; accord Gathering Storm, Revisited, supra note 10, at 19.

\(^{58}\) Augustine, supra note 10, at 1 (“The aviation and telecommunication revolutions have conspired to make distance increasingly irrelevant.”).

\(^{59}\) Porter, supra note 10, at 70; Gathering Storm, Revisited, supra note 10, at 43.

\(^{60}\) Porter, supra note 10, at 50-51.


\(^{62}\) In 2010 alone, CD sales dropped more than 20%; in contrast, downloads of music increased significantly. Id.

\(^{63}\) Not all innovations significantly affect market share. For example, if Honda develops an innovative new latch for a car door, Ford may not lose significant market
face of declining market share, these non-innovating U.S. companies will employ fewer U.S. workers and pay less in U.S. taxes.\textsuperscript{64}

Domestic innovation also affects the global competitiveness of U.S. workers, and “[t]he possession of high quality jobs is the foundation of a high quality life for the nation’s citizenry.”\textsuperscript{65} Unfortunately, many U.S. jobs are in jeopardy.\textsuperscript{66} By one estimate, nearly a third of all jobs in the United States could potentially be exported to foreign workers.\textsuperscript{67} This off-shoring is particularly likely because foreign labor, both skilled and unskilled, is often far cheaper than U.S. labor.\textsuperscript{68} For example, “eight engineers can be hired in India for the cost of one in the United States. Five chemists can be employed in China for the cost of one in the United States.”\textsuperscript{69} Advances in technology that enhance the productivity of U.S. share. Consumers may not consider the innovation significant enough to adjust their buying habits. Similarly, other aspects of a product, such as brand recognition, may overshadow even substantial innovations.

\textsuperscript{64} \textit{GATHERING STORM, REVISITED}, supra note 10, at 5, 17-18. Promoting innovation may not guarantee that the United States will be a good place for all businesses. Countries that promote innovation might be well suited for research and development functions but not manufacturing. For example, Apple received a great deal of attention for its innovations, but Apple employs only about 50,000 people. Fareed Zakaria, \textit{The Future of American Innovation: Can America Keep Pace?}, \textsc{Time} (June 5, 2011), \url{http://www.time.com/time/nation/article/0,8599,2075226,00.html}. In contrast, Apple’s main supplier, Foxconn employs 1,000,000. \textit{Id}. Nevertheless, promoting innovation will help the U.S. economy even if some aspects of a business remain tied to foreign economies. If research and development functions are conducted in the United States, the U.S. economy will benefit more than if those activities were located in other countries.

\textsuperscript{65} \textit{GATHERING STORM, REVISITED}, supra note 10, at 2.

\textsuperscript{66} \textsc{AUGUSTINE}, supra note 10, at 66 (explaining that American businesses can thrive by outsourcing while U.S. workers become unemployed”).


\textsuperscript{68} \textsc{AUGUSTINE}, supra note 10, at 28.

\textsuperscript{69} \textsc{AUGUSTINE}, supra note 10, at 28. If U.S. workers are less innovative than workers in other countries, even U.S. companies may outsource their research and development to centers in foreign countries. \textsc{AUGUSTINE}, supra note 10, at 63 (reporting that “only 41% of the global corporations responding to a recent survey ranked the United States as an ‘attractive’ location for new R&D facilities, compared with 62% for
workers may protect these U.S. jobs from international outsourcing. Furthermore, innovation can generate new employment opportunities in the United States because “the creation of new, high quality jobs is today disproportionately dependent upon advances in science and engineering.”

The second reason that superlative innovation is important to the U.S. economy is that exceptional economic growth is necessary to “sustain[] the lifestyle which has come to be enjoyed—and expected—by America’s citizenry.” U.S. citizens are some of the wealthiest people on the planet. Among developed countries, the United States has the second highest median household income. To maintain these exceptional income levels, U.S. businesses and workers must compete effectively in global markets, and domestic innovation is critical to that competition.

In the words of one commentator: “What’s at stake is nothing less than the future prosperity and security of our nation.”

B. Current U.S. Innovation Performance

Although measuring innovation is difficult, it does not appear that the United States is “out-innovat[ing] . . . the rest of the world.” The Introduction highlighted a number of troubling facts regarding U.S.
innovation. Other measures also indicate problems. For example, economic analysts have compiled global innovation rankings relying on multiple factors related to innovation, and the rankings of the United States in these studies are disquieting. The Information Technology and Innovation Foundation recently released a study comparing the innovative capacity of forty different countries. The study considered sixteen factors to measure innovation capacity in each country, including the number of science and technology researchers, the amount of capital invested in research, the number of scholarly publications, the availability of technological infrastructure like high-speed Internet, tax rates, gross domestic product per working-age adult, and worker productivity. The study concluded that the United States ranked fourth, behind Singapore, Finland, and Sweden. Most alarming, however, was the study’s consideration of investment in innovation in the past twelve years. In that comparison, the United States ranked an abysmal thirty-ninth. Another multifactor analysis of innovation ranked the United States fifth in the world in 2011. Similarly, in a 2010 Boston Consulting Group report identifying new, innovative companies, six out of seven companies were from outside the United States. Likewise, a report by the Economist

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77 ATKINSON & ANDES, supra note 76, at 9.
78 Id. at 5.
79 Id. at 9.
80 Id. at 11.
Three companies are from China, one is from Japan, one is from Taiwan, and one is from Brazil. Id.
evaluated the capacity of different countries to capitalize on information
technologies and ranked the United States third.\textsuperscript{83}

Patents provide another gauge of the innovation output of different
countries. A patent gives a person the exclusive right to use a new
technology in the country that issued the patent. For example, a U.S.
patent gives its owner the exclusive right to “make, use, sell, and offer for
sale” an invention in the United States.\textsuperscript{84} These rights encourage an
inventor to invest time and resources in developing new technology by
protecting the inventor from copyists, thereby allowing the inventor to
obtain supra-competitive profits during the period of exclusivity.\textsuperscript{85}
Because of the value of patents, important innovations are frequently
patented.\textsuperscript{86} Moreover, in many countries, patents provide data regarding
the nationality of the inventor who obtained the patent. As a result, patent
activity can serve as a proxy for the innovation output of different
countries.\textsuperscript{87}

\textsuperscript{83} \textit{Economist Intelligence Unit, Digital Economy Rankings 2010: Beyond
E-Readiness} 4 (2010). Some other studies evaluating U.S. innovation are more
optimistic. \textit{See}, \textit{e.g.}, \textit{World Economic Forum, The Global Competitiveness
Report 2010-2011} 22 (2011) (ranking the United States first in “innovation” but fourth
in overall “competitiveness”); \textit{Innovate America, supra} note 9, at 36 (“America today
is a clear No. 1 in productive innovation.”).
\textsuperscript{84} 35 U.S.C. § 271(a).
\textsuperscript{85} \textit{Id.} U.S. patents are particularly valuable because the United States economy is
the largest market in the world. \textit{The World Factbook, Field Listing: GDP (Official
(last visited Dec. 19, 2011).
\textsuperscript{86} Indeed, patent numbers closely correlate with other measures of innovation.
Griliches, \textit{supra} note 73, at 1673 (noting the “strong relationship between patent numbers
\textsuperscript{87} Importantly, however, patents are only a proxy for innovation, and not a precise
measure. First, many innovations are not patented. Stuart J.H. Graham et al., \textit{High
Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent
Survey}, 24 BERKELEY TECH. L.J. 1255, 1290 fig.1 (2009). Other forms of intellectual
property, such as trade secrets, may protect inventions. \textit{Id.} Second, even when
inventions are patented, they may not be commercialized. Sichelman, \textit{supra} note 44, at
344; \textit{see also} Elizabeth Webster & Paul H. Jensen, \textit{Do Patents Matter for
Commercialization?}, 54 J. L. & ECON. 431, 431 (2011) (finding that many inventions
patented in Australia are not commercialized); \textit{supra} note 33 to 35 and accompanying
text. Indeed, some patents are invalid because they do not describe sufficiently new
technology. Microsoft Corp. v. i4i Ltd. P’ship, 131 S. Ct. 2238, 2242 (2011). Some
patents thus do not reflect innovation. \textit{See} Brett M. Frischmann & Mark A. Lemley,
The United States is not leading the world in patenting. For example, in 2009, Japanese inventors received 224,795 patents in various patent offices around the world.\(^88\) In contrast, American inventors received only 135,193 patents.\(^89\) This trend likely will continue, as Japanese inventors are also filing more patent applications than American inventors. In 2009, Japanese inventors outpaced their American counterparts by more than 80,000 patent applications.\(^90\) U.S. inventors are even struggling to maintain dominance in the U.S. Patent Office. For the past four years, foreign inventors received more than 50% of the patents issued by the U.S. Patent Office.\(^91\) In 1963, foreign inventors accounted

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\(^{89}\) Id.

\(^{90}\) Id.

for just 18.6% of U.S. patents.\textsuperscript{92} Matters are worse when adjusted for population. The United States is the third most populous country in the world.\textsuperscript{93} If innovation is to drive economic prosperity in the United States, then the United States likely will need more innovations than a less populous country.\textsuperscript{94} Among countries whose inventors obtained at least one thousand patents in 2009, the United States ranked eighth in patents per capita.\textsuperscript{95} Per capita, Japanese inventors received four times as many patents as U.S. inventors.\textsuperscript{96}

Thus, by many measures, the United States trails other countries in innovating.\textsuperscript{97} Indeed, many commentators argue that the United States is beginning to suffer from an “innovation gap.”\textsuperscript{98} In the words of one commentator, “America’s economy is in danger of losing what has always been our greatest competitive advantage: our genius for innovation.”\textsuperscript{99}


\textsuperscript{94} GATHERING STORM, REVISITED, supra note 10, at 46 (arguing that “the size of the economy to be maintained affects the size of the effort needed for its maintenance”). Per capita patent figures favor countries in which much of the industry is focused on technologically sophisticated industries. For example, if every employable citizen in a country were in a technologically sophisticated industry, the citizenry of such a country would produce more patents on a per capita basis than a country where only a handful of people are focused on developing new technology.

\textsuperscript{95} See Appendix A infra (calculating patents per capita and patent applications per capita using figures from the World Intellectual Property and the World Bank). In fact, almost half of the patents issued in 2009 worldwide were issued to inventors from countries with higher per capita patenting rates than the United States. \textit{Id.} Similarly, for per capita patent application in 2009, the United States ranked tenth. \textit{Id.}

\textsuperscript{96} \textit{Id.}

\textsuperscript{97} INNOVATE AMERICA, supra note 9, at 37 (noting that “we now face much more serious competitive challenges from new centers of innovation across an increasingly interconnected planet”).

\textsuperscript{98} \textit{E.g.,} ESTRIN, supra note 2, at 4-5 (arguing that America “has lost the core values that were the catalysts of its [innovation] success”); KAO, supra note 10, at 2 (asserting that America’s “capacity for innovation is eroding”); INNOVATE AMERICA, supra note 9, at 38 (similar); John C. Lechleiter, \textit{America’s Growing Innovation Gap}, WALL STREET JOURNAL (stating that “America’s economy is in danger of losing what has always been our greatest competitive advantage: our genius for innovation”); \textit{see also} AUGUSTINE, supra note 10, at 4 (stating that “America is rapidly losing its competitive position”).

\textsuperscript{99} John C. Lechleiter, \textit{America’s Growing Innovation Gap}, WALL STREET JOURNAL. In a 2009 survey, only forty-one percent of Americans stated that the United
The remainder of this Article addresses whether U.S. patent law can help U.S. inventors to close this gap.

III. PROTECTIONISM

One potential mechanism for using U.S. patent law to provide an advantage to U.S. companies and inventors in competing against foreign innovators would be for U.S. patent law explicitly to favor U.S. interests in awarding and enforcing patents. For example, U.S. law could require that the U.S. Patent Office prioritize the review of applications from U.S. inventors, apply more lenient standards when examining patent applications filed by U.S. citizens, or charge different application fees depending on inventor nationality. U.S. patent law could also be facially neutral but still discriminate against foreign inventors. For instance, U.S. patent law could deny patent protection for inventions that lacked domestic manufacturing in the United States. These types of protectionist patent laws might help domestic innovators obtain patents and thus might increase the returns on investments in innovation in the United States.

This Part examines the capacity of U.S. patent law to implement a protectionist agenda, and begins by examining the extent to which U.S. patent law historically has embraced protectionism. Next, this Part examines the extent to which international treaties prevent the United States from enacting protectionist patent law and determines that the United States would risk international sanctions if it were to return to its protectionist past. Finally, in light of these risks, this part considers whether implementing protectionist patent law would promote prosperity in the United States.

A. Protectionist Roots in U.S. Patent Law

In the past, U.S. patent law was often explicitly protectionist. For example, under the Patent Act of 1793, U.S. patents could only issue to “a citizen or citizens of the United States.”

100 In 1800, Congress amended the Patent Act to extend patent eligibility to foreign inventors, but only if

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Daniel McGinn, The Decline of Western Innovation: Why America Is Falling Behind and How to Fix It, NEWSWEEK, Nov. 23, 2009, at 34.
those inventors “resided two years in this country, and made oath of their intention to becoming citizens of the United States.”\textsuperscript{101} For more than forty years, the discoveries of non-resident foreign inventors received no patent protection in the United States, so that “foreign inventions could be introduced to America without the additional cost of the inventor’s monopoly rights.”\textsuperscript{102} In 1836, Congress amended the Patent Act to allow non-resident foreign inventors to obtain U.S. patents,\textsuperscript{103} but simultaneously introduced a protectionist scheme of patent application fees. The fee schedule required that a U.S. citizen pay thirty dollars to file a patent application, a “subject of the King of Great Britain” pay five hundred dollars, and any other non-resident non-citizen pay three hundred dollars to file an application for a U.S. patent.\textsuperscript{104} Protectionist application fees remained in place until 1870, when Congress established uniform fees for all patent applicants regardless of nationality or residency.\textsuperscript{105}

Even after the elimination of discriminatory fees, U.S. patent law retained protectionist elements, particularly in addressing concurrent invention by U.S. and foreign inventors. For instance, the Patent Act of 1870 established a “caveat” system that, until 1903, was only available to U.S. citizens and foreign inventors who “resided in the United States one year next preceding the filing of [their] caveat[s], and made oath[s] of [their] intention[s] to become . . . citizen[s].”\textsuperscript{106} Under this system, an inventor could file with the Patent Office an abbreviated patent application called a “caveat” that would serve as a placeholder for a normal patent application. If another inventor later filed an application on the same invention, the first inventor could file a patent application, which the U.S.

\textsuperscript{103} Patent Act of 1836 § 10, 5 Stat. 117 (July 4, 1836).  
\textsuperscript{104} Id. § 9. A foreign inventor could avoid these heightened fees if he “ha[d] been resident in the United States for one year . . . and . . . made oath of his intention to become a citizen thereof.” Id.  
\textsuperscript{105} Patent Act of 1870 § 68, Ch. 230, 16 Stat. 198 (July 8, 1870); see Nuno Pires de Carvalho, The Primary Function of Patents, 2001 U. ILL. J.L. TECH. & POL’y 25, 43 n.90.  
Patent Office would treat as if it were filed on the date the inventor filed the caveat.\textsuperscript{107} The caveat thus preserved an inventor’s chronological priority while giving the inventor an opportunity to allow the “invention or discovery . . . to mature” into a commercially successful endeavor.\textsuperscript{108} If an invention did not prove commercially viable, an inventor who filed a caveat would have avoided the greater expense of filing a complete patent application.\textsuperscript{109}

Protectionist features of U.S. patent law existed as recently as 2011. Prior to that time, U.S. patent law favored U.S. inventors over non-resident foreign inventors regarding the establishment of “invention dates.” For more than a century, certain issues in U.S. patent law depended on the date an invention was discovered. For example, an inventor could not obtain a patent if “the invention was . . . described in a printed publication . . . before the invention thereof [i.e., before the invention date].”\textsuperscript{110} Similarly, when two people discovered the same invention and both applied for patents, U.S. patent law awarded a patent only to the person with the earlier invention date, even if the first person to invent was the second person to apply for a patent.\textsuperscript{111} In determining dates of invention U.S. patent law disfavored foreign inventors in that “an applicant for a patent . . . shall not be permitted to establish the date of invention or discovery by reference to . . . activity . . . in a country foreign to the United States.”\textsuperscript{112} As a result, foreign, nonresident inventors usually

\begin{itemize}
  \item[\textsuperscript{107}] Patent Act of 1870 § 40, Ch. 230, 16 Stat. 198 (July 8, 1870). By statute, a caveat would only protect an inventor for one year.
  \item[\textsuperscript{109}] Caveats were shorter than patent applications and also involved smaller fees. Patent Act of 1870 §§ 40, 68, Ch. 230, 16 Stat. 198 (July 8, 1870).
  \item[\textsuperscript{110}] 35 U.S.C. § 102(a); see also Patent Act of 1870 § 24, Ch. 230, 16 Stat. 198 (July 8, 1870) (preventing a person from obtaining a patent on an invention that had been “described in any printed publication in this or any foreign country, before his invention or discovery thereof”).
  \item[\textsuperscript{111}] See, e.g., Griffith v. Kanamaru, 816 F.2d 624 (Fed. Cir. 1987) (discussing invention dates). When determining which inventor was first, U.S. patent law defined the date of invention as the date that an idea was initially conceived, provided that the first person to conceive of an invention was diligent in reducing that conception to practice. See infra note 173 and accompanying text.
\end{itemize}
could not establish invention dates that were earlier than the dates they filed U.S. patent applications because they performed the activities relevant to establishing invention date in foreign jurisdictions. In contrast, most U.S. inventors performed these activities within the United States. Because of this protectionist difference, a foreign inventor could fail to obtain a U.S. patent even if the foreign inventor discovered an invention before an American counterpart. The protectionist restrictions of this aspect of U.S. patent law significantly diminished over time. For example, in 1994, Congress amended the Patent Act so that inventive activity in foreign countries that are members of the World Trade Organization ("WTO") could be used to establish invention date under U.S. patent law. Nevertheless, for non-WTO countries, this protectionist provision of U.S. patent law was not eliminated until 2011.

B. The Legality of Protectionist U.S. Patent Law

U.S. patent law might favor U.S. interests by resurrecting the protectionism historically embraced by U.S. patent law. For example, the U.S. Patent Office could examine patent applications filed by U.S. inventors before applications filed by foreign inventors. Similarly, Congress could require that foreign inventors pay larger filing fees.

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115 At present, there are 153 countries that are members of the WTO. See Understanding the WTO: The Organization, Members and Observers, WORLD TRADE ORG., http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm (last visited Dec. 19, 2011).
116 Some other provisions of U.S. law that are related to patent law arguably are still protectionist. For example, § 204 of Title 35 states that a small business or nonprofit organization that receives a patent for an invention discovered using federal funds shall not grant an exclusive license to use an invention in the United States unless the licensee “agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States.” As noted supra, this is not the type of law included in the term “patent law” for this article. See supra note 42.
117 Indeed, as recently as June 2010, the U.S. Patent Office proposed delaying the examination of many applications submitted by foreign inventors. Enhanced Examination Timing Control Initiative, 75 Fed. Reg. 31,764 (proposed June 4, 2010). Specifically, the U.S. Patent Office proposed regulations that would accelerate the examination of some patent applications while delaying the examination of others. As part of a scheme, the U.S. Patent Office recommended delaying the examination of any
Such protectionist actions, however, would violate the terms of international treaties that the United States has joined. For example, in 1887, the United States signed the Paris Convention for the Protection of Industrial Property (“Paris Convention”). Article 2 of this treaty provides: “Nationals of any country [that has signed the treaty] shall, as regards the protection of industrial property, enjoy in all of the other countries [that have signed the treaty] the advantages that their respective laws now grant, or may hereafter grant, to nationals.” Similarly, in 1994, the United States signed the Agreement on Trade-Related Aspects of Intellectual Property Rights (“TRIPS”). Article 3 of TRIPS states that “[e]ach Member shall accord to the nationals of other Members treatment no less favourable than that it accords its own nationals with regard to the protection of intellectual property.” Furthermore, under Article 27 of TRIPS, patent rights must be available “without discrimination as to the place of invention, . . . and whether products are imported or locally produced.”


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118 *Paris Convention for the Protection of Industrial Property*, July 14, 1887.
119 *Id.* Art. 2; *see also* *id.* Art. 1 (stating that the protection of “industrial property” includes patents). The Paris convention also prohibits some laws that are facially neutral but have differential impact on foreign inventors. For example, the Paris Convention states that “no requirement as to domicile . . . may be imposed.” *Id.* Art. 2(2).
122 *Id.* art. 27(1).
Although these treaties appear to prohibit protectionist U.S. patent law, their effect is limited in two ways. First, Congress can repudiate these treaties by passing a contrary statute, like a protectionist provision of patent law. The U.S. Constitution declares that “all Treaties made, or which shall be made, under the Authority of the United States, shall be the supreme Law of the Land.”\textsuperscript{123} However, “Congress has the power, accepted since at least 1798, to terminate, or repudiate, treaty obligations altogether.”\textsuperscript{124} As an administrative agency, the power of the U.S. Patent Office to repudiate a treaty may be more limited than Congress’s. The U.S. Patent Office may nevertheless be able to embrace protectionism because of the second limit on the scope of these two treaties: They cannot be applied in U.S. courts. Treaties can only be judicially enforced if they are “self-executing,” in which case courts apply such treaties like federal statutes.\textsuperscript{125} If a treaty is held to be “non-self-executing,” supporting federal legislation is required to give legal effect to the treaty’s provisions.\textsuperscript{126} Significantly, courts have generally held that the Paris Convention and the TRIPS Agreement are not self-executing.\textsuperscript{127} As a result, if the U.S. Patent Office were to implement a protectionist agenda, foreign inventors and business could not bring challenges in U.S. courts.\textsuperscript{128}

\textsuperscript{123} U.S. CONST. art. VI.
\textsuperscript{124} Tim Wu, Treaties’ Domains, 93 VA. L. REV. 571, 587 (2007).
\textsuperscript{125} ITC Ltd. v. Punchgini, Inc., 482 F.3d 135, 161 n.21 (2d Cir. 2007); Wu, supra note 124, at 578.
\textsuperscript{126} Wu, supra note 124, at 579-80. Determining whether a treaty is self-executing is a complicated analysis involving many factors. \textit{Id}.
\textsuperscript{128} For example, in 1889 a Swiss inventor challenged under the Paris Convention the provision of U.S. patent law barring non-resident foreign inventors from filing caveats. Caveats for Patents for Inventions, 19 U.S. Atty. Gen. 273, 274-75 (1889). In a published opinion, the U.S. Attorney General agreed that the Paris Convention conflicted...
Although these treaties provide little obstacle to protectionism under U.S. law, they may nonetheless be enforced through international enforcement mechanisms. The Paris Convention provides that “[a]ny dispute between two or more countries of the Union concerning the interpretation or application of this Convention, not settled by negotiation, may, by any one of the countries concerned, be brought before the International Court of Justice.”\(^{129}\) Under the TRIPS Agreement, a foreign country could not unilaterally retaliate against the United States for protectionist laws, and instead would have to initiate enforcement proceedings in the World Trade Organization.\(^ {130}\) In fact, the United States has initiated numerous dispute resolution proceedings under TRIPS—more than all of the other WTO member countries combined.\(^ {131}\) In some instances, the United States has used WTO enforcement mechanisms to attack protectionist patent laws of other countries.\(^ {132}\) Similarly, another

\(^{129}\) Paris Convention Art. 28(1).

\(^{130}\) TRIPS Agreement, supra note 120, art. 64; see also Understanding on Rules and Procedures Governing the Settlement of Disputes Art. 23, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 2, Legal Instruments—Results of the Uruguay Round, 33 I.L.M. 1125, 1226 (1994) (describing WTO dispute resolution proceedings). Because TRIPS incorporates the anti-protectionist provisions of the Paris Convention, an aggrieved country could also invoke WTO dispute resolution mechanisms to address a violation of Article 2 of the Paris Convention. TRIPS Agreement, supra note 120, art. 2(1).

\(^{131}\) See Dispute Settlement: The Disputes, Disputes by Agreement, WORLD TRADE ORG.,


\(^{132}\) For example, in May 2000, the United States initiated proceedings against Brazil because Brazil’s patent laws stated that a patent was subject to compulsory licensing if the subject-matter of the patent is not manufactured in Brazil. Brazil - Measures Affecting Patent Protection, Request for Consultations by the United States, WT/DS199/1, WORLD TRADE ORG. (June 8, 2000), http://docsonline.wto.org/imrd/gen_searchResult.asp?RN=0&searchtype=browse&q1=%28%40meta%5FSymbol+WT%FCDS199%FC%2A%29&language=1 (follow “Brazil - Measures Affecting Patent Protection - Request for Consultations by the United States, 08/06/2000” hyperlink to HTML preview). Although facially neutral, such a provision favors Brazilian industries because they are naturally more likely to manufacture products in Brazil. The United States argued that this provision of Brazilian patent law violated the prohibition in TRIPS of “discrimination regarding the availability of patents and the enjoyment of patent rights on the basis of whether products are imported or locally produced.” Brazil - Measures Affecting Patent Protection, Request for the
country could use the enforcement mechanisms of the WTO and the
TRIPS Agreement to oppose protectionist patent law in the United States,
and a successful challenge to protectionist U.S. patent law would entitle
the prevailing country to enact retaliatory measures.\textsuperscript{133}

C. Policy Concerns with Protectionism

Although the United States might incur international sanctions for
returning U.S. patent law to its protectionist roots, the United States has
the ability to do so, and if the domestic benefits of protectionism outweigh
the costs, protectionist patent law might increase U.S. prosperity. However, protectionism likely would not increase U.S. innovation. In
general, governments eschew protectionism because it is economically inefficient.\textsuperscript{134} For example, if tariffs on imported goods prevent foreign
businesses from selling equivalent products at lower prices than domestic
rivals, then those tariffs actually create economic losses.\textsuperscript{135} Protectionism
nevertheless might be defended on the theory that, even if it reduces global economic prosperity, it increases domestic prosperity because it
protects domestic manufacturers.\textsuperscript{136} For example, if Chinese companies
can more cheaply manufacture computers than U.S. businesses, U.S.
tariffs on Chinese computers might help some domestic manufacturers, at
least in the short term.\textsuperscript{137} Similarly, eliminating filing fees at the U.S.

\textit{Establishment of a Panel by the United States, WT/DS199/3, WORLD TRADE ORG.} (Jan. 9, 2001),
http://docsonline.wto.org/imrd/gen_searchResult.asp?RN=0&searchtype=browse&q1=%28%40meta%5FSymbol+WT%FCDS199%FC%2A%29&language=1 (follow “Brazil -
Measures Affecting Patent Protection - Request for Consultations by the United States, 09/01/2001” hyperlink to HTML preview). After the WTO constituted a panel to resolve
the issue, the United States and Brazil settled.

\textsuperscript{133} Understanding on Rules and Procedures Governing the Settlement of Disputes
Art. 22, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade
Organization, Annex 2, Legal Instruments--Results of the Uruguay Round, 33 I.L.M.
1125, 1226 (1994).

\textsuperscript{134} Duffy, \textit{supra} note 121, at 702; John O. McGinnis & Mark L. Movsesian, \textit{The

\textsuperscript{135} NIGEL GRIMWADE, \textit{INTERNATIONAL TRADE POLICY: A CONTEMPORARY

\textsuperscript{136} Certainly, politicians who promote protectionism do so claiming to help
domestic industries.

\textsuperscript{137} DOUGLAS A. IRWIN, \textit{AN INTELLECTUAL HISTORY OF FREE TRADE} 92 (1996);
Duffy, \textit{supra} note 121, at 702; McGinnis & Movsesian, \textit{supra} note 134, at 522 (noting
Patent Office for U.S. inventors might increase the expected returns for U.S. invention and thus increase domestic innovation.

However, for almost two hundred years, economists have argued that protectionism reduces domestic prosperity. In general, protectionist tariffs on imports raise prices and thus create deadweight losses, in part because some domestic consumers cannot afford to pay the higher prices. More specifically, protectionist patent law would increase the price of innovations, and some U.S. consumers and U.S. businesses would be unable to afford to pay these increased prices. Protectionism also reduces domestic prosperity by insulating domestic businesses from the competitive pressures that lead to the development of superior products and services. As John Stuart Mill argued in 1848, protectionist tariffs “render the labour and capital of the country less efficient in production than they would otherwise be.” Consequently, protectionist patent laws would shield American inventors from competitive pressures that spur innovation, and American inventors might actually become less innovative. Finally, protectionist U.S. patent law might also undermine domestic prosperity by prompting other countries to enact their own protectionist measures. Indeed, as described above, protectionist U.S. patent law would violate TRIPS, and the WTO’s dispute resolution procedures encourage aggrieved countries to address violations through that free trade “does not make everyone within a nation better off, at least in the short term).

See GRIMWADE, supra note 135, at 23-24; IRWIN, supra note 137, at 3,90-92; see also id. at 93 (“All the leading economists from the first half of the nineteenth century—James Mill, David Ricardo, Robert Torrens, John Stuart Mill, John Ramsay McCulloch, Nassau Senior, to mention but the most eminent—wrote . . . in favor of free trade and stood in virtual unanimity against protectionist import duties.”). Protectionism regarding innovation may increase domestic welfare if domestic innovation “has important spillover effects on other sectors of the economy.” Id. Even in this situation, however, a direct subsidy of domestic innovation would be better than protectionist patent law. Id. Of course, the extent to which foreign governments and researchers retaliate against U.S. inventors depends upon the nature of U.S. protectionist measures. Some protectionist measures may be less inflammatory than others.
action in “the same sector(s) as that in which . . . [there has been] a violation.”

IV. TYPICAL APPROACHES TO IMPROVING U.S. PATENT OFFICE PROCEDURES

Protectionism is not the only way that law can help U.S. companies and inventors compete against foreign rivals. Protectionism shields domestic businesses from competitive forces in the hopes of increasing domestic prosperity. Sometimes, domestic innovators outperform their foreign rivals because they are better able to respond to competitive pressures. Such innovators have a “competitive advantage” over their competitors. More specifically, a competitive advantage is “a value-creating strategy using firm resources to improve a firm’s efficiency or effectiveness in ways not in use by current or potential competitors.”

Many factors contribute to competitive advantage, including law. For example, federal law governs the use of the airwaves for radio transmissions throughout the United States. If the federal government were to make more bandwidth available for commercial use, innovators located in the United States might be better able to develop new wireless technologies than foreign counterparts operating in countries where less

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144 See generally PORTER, supra note 10 (describing competitive advantage in global markets).


146 See PORTER, supra note 10, at 70 (noting that certain conditions encourage “firms [to] improve and innovate and continue to do so faster and in the proper directions compared to their international rivals”); see also MIHALY CSIKSZENTMIHALYI, CREATIVITY: FLOW AND THE PSYCHOLOGY OF DISCOVERY AND INVENTION 326-30 (1996) (discussing ways to increase “the proportion of people showing the traits of creativity”). See generally Bird, supra note 43, at 71 (modeling the determinates of competitive advantage in global markets).

147 Section 151 of Title 47 empowers the Federal Communications Commission to regulate “communication by wire and radio.”
bandwidth is available for innovation.\textsuperscript{148} A change in the regulation of the airwaves therefore might encourage domestic competitive advantage without protectionist side effects.\textsuperscript{149} Importantly, unlike protectionism, laws that create competitive advantage for domestic businesses do not reduce domestic or global prosperity. Instead, laws that promote U.S. competitive advantage increase global welfare and simultaneously enable the United States to capture a greater share of global markets.\textsuperscript{150}

For law to provide domestic competitive advantage, it must affect foreign and domestic businesses differently. To achieve this differential impact while avoiding explicit protectionism, U.S. law often must leverage factors extrinsic to law. For example, a change to U.S. law that increased the radio bandwidth available for commercial development in the United States may favor U.S. innovators because U.S. innovators generally operate in the United States, and foreign researchers generally work in their home countries.\textsuperscript{151} Identifying and leveraging extrinsic differences between domestic and foreign innovators is thus critical to creating competitive advantage through U.S. patent law.

\textsuperscript{148} Indeed, the Federal Communications Commission recently required changes to television broadcasts in part to “allow some of the spectrum to be auctioned to companies that will be able to provide consumers with more advanced wireless services (such as wireless broadband).” Learn about DTV: Frequently Asked Questions, DTV.gov, http://www.dtv.gov/consumercorner.html (last visited Dec. 19, 2011). But see PORTER, supra note 10, at 82-83 (discussing the impact of overcoming shortcomings on innovation).

\textsuperscript{149} Law can also create competitive disadvantages through restrictive regulations. For example, the German chemical company BASF recently announced plans to move a major research facility focusing on genetically modified organisms from Germany to the United States because “there is still a lack of acceptance for this technology in many parts of Europe – from the majority of consumers, farmers and politicians.” Press Release, BASF, BASF to concentrate plant biotechnology activities on main markets in North and South America, (January 16, 2012), http://www.basf.com/group/pressrelease/P-12-109.

\textsuperscript{150} Within some industries, the competitive advantages of foreign rivals may stem from economic conditions that are unique to that country and that the United States cannot emulate. PORTER, supra note 10, at 196-197.

\textsuperscript{151} Even if a foreign company were to open a research facility in the United States to take advantage of the U.S. airwave regulations, that research facility would contribute in some respects to the U.S. economy.
A. Historical Examples

The United States in the past used some simple aspects of U.S. patent law to provide U.S. companies and inventors with competitive advantages without being protectionist. One example is the use of the English language by the U.S. Patent Office. U.S. inventors are more likely to speak English than foreign inventors, who may face significant translation costs both in understanding U.S. patent laws and in drafting U.S. patent applications.\footnote{Patent applications may be filed “in a language other than English.” 37 C.F.R. § 1.52(b), (d). Before a patent can be examined by the U.S. Patent Office, however, a patent applicant must provide an English language translation of the application, a statement that the translation is accurate, and an additional processing fee. Id. § 1.52(d).} Cheaper access to U.S. patents likely provides U.S. inventors with a competitive advantage because U.S. patents – and only U.S. patents – provide exclusive rights to make, use, or sell an invention throughout the United States, which is the largest market in the world.\footnote{AUGUSTINE, supra note 10, at 61. Patents in a smaller economy generally are less valuable, as they impact less economic activity.}

Similarly, in the past the existence and strength of U.S. patent law may have provided U.S. inventors with substantial domestic competitive advantage because strong patent laws favor innovators over imitators, and U.S. companies historically have been world-leading innovators.\footnote{See Duffy, supra note 121, at 695-96 (noting that countries with many innovators favor patent protection, while countries with many copyists do not). For a long time, U.S. inventors apparently obtained more patents than inventors from any other country in the world. Econ. and Statistics Div., \textit{Total number of patent grants (1985-2009) by resident and non-resident}, WORLD INTELL. PROP. ORG., http://www.wipo.int/ipstats/en/statistics/patents/ (follow “Total number of patent grants (1985-2009) by resident and non-resident” hyperlink to XLS or CSV file) (last visited Dec. 19, 2011) (reporting patent grants by patent office, broken down by resident and non-resident from 1883-2009).} Without patent law, U.S. businesses might not have been able to recover the investments required to develop new technologies.\footnote{See William Hubbard, \textit{Inventing Norms}, 44 CONN. L. REV. 369, 374-75 (2011).} Foreign competitors could have copied U.S. innovations and undercut U.S. inventors’ prices because the foreign copies would not have needed to include development costs in their pricing.\footnote{MERGES ET AL., supra note 44, at 12.} For this reason, the United States was a major proponent of international treaties, particularly TRIPS,
that required all signatories to enact laws providing for robust patent rights. Countries whose citizens produce fewer inventions may benefit from weaker patent protection.

Today, these two sources of competitive advantage likely are eroding. The use of English in U.S. patent law may not provide significant competitive advantage in the near future because citizens of many countries around the world are learning English. By one estimate, “China graduates more English-speaking engineers than the United States.” Moreover, the magnitude of any “English advantage” may be decreasing because U.S. patents soon may not be the most valuable type of patents in the world: “Between 2012 and 2020, China will pass the United States to become the largest consumer market in the world.” As a result, cheap access to Chinese patents may become as important as cheap access to U.S. patents. Similarly, strong U.S. patent law by itself may be insufficient to provide domestic competitive advantage because foreign inventors obtain many U.S. patents. In fact, in some technological areas, foreign inventors obtain more U.S. patents than U.S. inventors.

B. Improving the U.S. Patent Office

Traditionally, patent scholars and policymakers attempt to improve the workings of the U.S. Patent Office by reducing (1) the cost and duration of the examination of patent applications and (2) the number of invalid patents issued by the U.S. Patent Office. Indeed, President Obama and the congressional supporters of the America Invents Act

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157 Duffy, supra note 121, at 695-96.
158 Id.
159 Id. at 696.
161 AUGUSTINE, supra note 10, at 44.
162 Id. at 61.
163 See supra notes 91 to 96 and accompanying text.
164 See infra note 201 (discussing technological areas in which foreign inventors obtain more U.S. patents than U.S. inventors).
165 A U.S. patent can be invalid for many reasons. See 35 U.S.C. §§ 101-03, 112.
166 For a sample of typical approaches to improving the processing of patent applications by the U.S. Patent Office, see supra note 44 and accompanying text.
content that the Act achieves all of the traditional types of improvements to the processes of the U.S. Patent Office, and that these improvements will increase U.S. competitiveness in global markets.166 This Section reviews the alleged improvements to the procedures of the U.S. Patent Office and analyzes whether these traditional types of improvements can create domestic competitive advantages.167

1. Improvements in the American Invents Act

The America Invents Act contains numerous, significant changes to U.S. patent law designed to reduce the cost and delay of obtaining a U.S. patent. For example, the Act ensures that the U.S. Patent Office will retain more of the fees it collects from patent applicants.168 With more money, the Patent Office can hire more patent examiners and purchase better equipment, thereby decreasing the time required to examine patent applications. The Act also reduces the cost of filing patent applications for certain inventors working for small businesses.169

Perhaps the largest potentially cost-saving reform in the Act is the change from a “first to invent” system to a “first to file” system.170 These

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167 The Act contains other provisions that may improve the speed and quality of patent examination by the U.S. Patent Office.


169 Id. § 10 (providing reduced filing fees for applicants that are “micro entities”).

170 Id. § 3.
two systems use different approaches to determining two important dates in patent law: the novelty critical date and the priority date. The novelty critical date is used in patent law to determine whether a discovery is sufficiently new to warrant patent protection; discoveries that are not sufficiently new as of the novelty critical date will not receive protection.171 Priority dates are used to resolve disputes between inventors to the same invention; the inventor with the earlier priority date will receive the patent.172

Under the old “first to invent” system, these two important dates were both defined as the date an inventor conceived of a discovery, provided that the inventor was sufficiently diligent in reducing that conception to practice.173 Because an inventor conceives of an invention well before filing a patent application, the novelty critical date and priority date under in a “first to invent” system are often a date prior to the filing of a patent application.

In contrast, under a “first to file” system, both dates are defined as the date that the inventor actually files a patent application.174 Thus, novelty critical dates and priority dates under a “first to file” system are sometimes later than the same dates under a “first to invent” system.175

This difference in dates can affect both the validity and ownership of patent applications.176

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171 See, e.g., 35 U.S.C. § 102(a) (denying patent protection for an invention that was “known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent”). Patent law uses other critical dates for issues other than novelty. See, e.g., id. § 102(b) (using as a critical date the date one year before the filing date of a patent application).

172 See, e.g., id. § 102(g) (denying patent protection to an inventor who was not the first to discover an invention).

173 35 U.S.C. §§ 102(a); 102(g). Conception occurs “when the inventor has a specific, settled idea, a particular solution to the problem at hand . . . .” Creative Compounds, LLC v. Starmark Labs., 651 F.3d 1303, 1312 (Fed.Cir.2011) (quoting Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223, 1228 (Fed.Cir.1994)). “In order to establish an actual reduction to practice, the inventor must prove that: (1) he constructed an embodiment or performed a process that met all the limitations of the interference count; and (2) he determined that the invention would work for its intended purpose.” Cooper v. Goldfarb, 154 F.3d 1321, 1327 (Fed. Cir. 1998).


175 Under the old “first to invent” system, a patent applicant could use the patent application filing date as the constructive date of conception and reduction to practice. Solvay S.A. v. Honeywell Intern., Inc., 622 F.3d 1367, 1376 (Fed. Cir. 2010).
patents. For example, in a “first to file” system, an inventor may be unable to obtain a patent on a discovery that was novel on the date of conception but common knowledge by the time the inventor filed a patent application. Likewise, in a “first to file” system, the first person to file a patent application will have priority and receive the patent, which is different from a “first to invent” system, where the second person to file a patent application will receive the patent if she establishes an earlier conception date and demonstrates diligent reduction to practice.

Proponents of the shift to a “first to file” system argued that a “first to file” system was cheaper and faster to operate than a “first to invent” system in at least two respects. First, because conception and reduction to practice are fact-intensive issues, determining novelty critical dates and priority dates in a “first to invent” system is complicated, uncertain, and expensive. For example, “[c]onception is complete only when the idea is so clearly defined in the inventor’s mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation.” As a result, determining conception requires detailed investigation into the “inventor’s mind,” the level of “ordinary

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176 See 35 U.S.C. § 102(a) (stating that “[a] person shall be entitled to a patent unless . . . the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent”); id. § 103 (“A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”). Under the America Invents Act, an inventor can publicly disclose his or her discovery up to one year before filing a patent application and still obtain a patent. Leahy-Smith America Invents Act § 3, Pub. L. No. 112-29, 125 Stat. 284 (2011).

177 The America Invents Act also establishes new “derivation proceedings” that prevent a person from obtaining a patent by copying an invention from an inventor and filing a patent application before that inventor files a patent application. Leahy-Smith America Invents Act § 3, Pub. L. No. 112-29, 125 Stat. 284 (2011). Derivation proceedings, however, must be initiated “within the 1-year period beginning on the date of the first publication of a claim to an invention.” Id.

178 35 U.S.C. § 102(g); see also Griffith v. Kanamaru, 816 F.2d 624, 629 (Fed. Cir. 1987) (awarding a patent to the first inventor to file a patent application because the second inventor to file an application was not diligent in reducing his prior conception to practice).

179 Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223, 1228 (Fed.Cir.1994).
skill,” and the difficulty of “reduc[ing] the invention to practice.” Moreover, much information regarding these issues is not publicly available, such as the inventor’s mental state prior to filing a patent application. Challenges in determining novelty critical dates under the “first to invent” system can hamper the efforts of patent owners, patent examiners, and competitors to assess the validity of a patent or patent application. Likewise, near-simultaneous inventors in a “first to invent” patent systems may incur substantial costs in resolving competing claims to the same discovery. In contrast, determining priority dates in a “first to file” system is quick and inexpensive. Patent filing dates are easy to identify and published online. The second reason that a “first to file” system may be cheaper than a “first to invent” system is that nearly every other patent office in the world uses a “first to file” system rather than a “first to invent” system. Consequently, proponents of the America Invents Act argued that the Act “would make it easier for U.S. inventors to get innovations patented overseas because they would not have to prepare applications for two different systems.”

The America Invents Act also contains numerous provisions designed to reduce the number of invalid patents issued by the U.S. Patent Office. For example, the America Invents Act creates a new process through which third parties can submit information “of potential relevance to the examination of [an] application,” including a statement explaining the relevance of the information. Prior to the Act, U.S. patent law allowed third parties to submit to the U.S. Patent Office “patents or publications relevant to a pending published application” but prohibited third parties from including “any explanation of the patents or publications, or any other information.”

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182 Leahy-Smith America Invents Act § 8, Pub. L. No. 112-29, 125 Stat. 284 (2011). Submitted information must be in the form of “a patent application, any patent, published patent application, or other printed publication.”
183 37 C.F.R. § 1.99(d); see also 35 U.S.C. § 301 (providing that, for an issued U.S. patent, a third party may submit to the U.S. Patent Office “patents or printed publications” and a statement of their relevance to the validity of the U.S. patent).
parties to help the U.S. patent examiners evaluate patent applications may reduce the number of invalid patents issued by the U.S. Patent Office.\textsuperscript{184}

The America Invents Act also may improve the quality of U.S. patents by expanding the administrative procedures available to third parties for challenging the validity of issued U.S. patents. Even before the Act, a third party could challenge a U.S. patent’s validity through an administrative process known as reexamination, but U.S. patent law limited these proceedings in two significant respects.\textsuperscript{185} First, reexamination could only address “a substantial new question of patentability,” thus excluding any validity issues already considered in the initial examination of the patent.\textsuperscript{186} Second, third parties could not raise certain types of validity challenges in reexaminations, such as asserting that a patent does not cover patent eligible technology.\textsuperscript{187} The America Invents Act creates a new “post-grant review” procedure that lacks both of these limitations. In a post-grant review, a third party will be able to assert any invalidity critique that could be made in federal court.\textsuperscript{188} Post-grant review proceedings, however, can only be initiated within nine months of a patent’s issuance.\textsuperscript{189} For challenges after this initial time period, the America Invents Act replaces the older reexamination procedures with a new administrative procedure called “inter partes review.”\textsuperscript{190} Like the older reexaminations, certain validity challenges cannot be raised in inter partes review, but in other respects inter partes reviews are broader than reexamination. Significantly, inter partes reviews are not limited to “substantial new question[s] of patentability” like reexaminations; instead, third parties can raise in inter partes reviews some validity issues that were already considered in the initial examination of the patent.

\textsuperscript{185} 35 U.S.C. §§ 301-318.
\textsuperscript{186} 35 U.S.C. § 303(a); In re NTP, Inc., 654 F.3d 1268, 1275 (Fed. Cir. 2011).
\textsuperscript{187} In re NTP, Inc., 654 F.3d 1268, 1275-76 (Fed. Cir. 2011).
\textsuperscript{189} Id.
2. The Competitive Effects of Traditional Improvements

At first blush, one might assume that making the processes at the U.S. Patent Office cheaper, faster, and more accurate would help U.S. companies compete in global markets. After all, U.S. patents provide exclusive rights to inventions through the United States, and, by a wide margin, U.S. inventors historically have received more U.S. patents than inventors from any other country. For example, in 2010, the U.S. Patent Office issued approximately 219,000 patents. U.S. inventors received about 107,000 of these patents. The second largest number of U.S. patents issued to Japanese inventors, who received only 44,000 U.S. patents.

Moreover, all of the traditional improvements to the U.S. Patent Office can increase the value of U.S. patents. Reducing the cost of obtaining U.S. patents increases their net value. Likewise, when U.S. patents issue more quickly, innovators can commercialize new technology more quickly. Reducing the number of invalid U.S. patents in circulation also can increase the value of valid U.S. patents because invalid patents often decrease the returns from innovation. After a business commercializes a valid U.S. patent, the business may be sued for allegedly infringing an invalid U.S. patent. Even if an accused innovator litigates and successfully demonstrates that a patent is invalid, such a successful legal defense is expensive, in part because the innovator must prove that the patent is invalid by clear and convincing evidence. These litigation costs reduce the profits from valid U.S. patents. Alternatively,

192 Id.
193 Id.
194 Inventors may also use issued U.S. patents to obtain capital that can be used to commercialize new technology. Clarisa Long, Patent Signals, 69 U. Chi. L. Rev. 625, 642 (2002) (discussing the use of patents as signals in capital markets).
196 Indeed, James Bessen and Michael J. Meurer have argued that “by the late 1990s, litigation costs clearly exceeded the profits from patents outside the chemical and
an innovator “may choose to make payments under licensing arrangements, or perhaps decide not to market its product at all, rather than contest the patent proprietor’s claims.” 197

Nevertheless, for two reasons it is doubtful that reducing the cost, duration, and inaccuracy of the processing of patent applications by the U.S. Patent Office will provide significant competitive advantage to domestic innovators. First, traditional improvements to the U.S. Patent Office do not capitalize on any differences between foreign and domestic inventors and therefore will help any inventor when she obtains a U.S. patent regardless of her nationality. 198 For example, if the America Invents Act reduces the cost of obtaining a U.S. patent by $10, both foreign and domestic inventors will save $10 when they apply for a patent. Moreover, an inventor who uses the U.S. patent office more will receive greater benefits. If the cost of obtaining a U.S. patent drops by $10, an inventor who obtains ten patents will save $100, while an inventor who obtains five patents will save only $50. Likewise, if the U.S. Patent Office were to process patent applications 20% faster, an inventor who previously would have received only five patents would instead receive six patents, while an inventor who previously would have received ten patents would receive twelve patents. Similarly, if the value of U.S. patents increases by $10 per patent because the U.S. Patent Office issues fewer invalid patents, an inventor who obtains more U.S. patents will receive a larger gain than someone who obtains fewer U.S. patents. In short, the traditional improvements to the U.S. Patent Office will magnify existing disparities in the acquisition of U.S. patents.

Unfortunately, this magnification will not help U.S. inventors because, for the past four years, the U.S. Patent Office has issued more U.S. patents to foreign inventors than U.S. inventors. 199 For example, in

pharmaceutical industries.” JAMES BESSEN &MICHAEL J.MEURER, PATENT FAILURE 140 (2008).
197 SCHACHT & THOMAS, supra note 184, at 29.
198 See supra note 151 and accompanying text (discussing the importance of factors extrinsic to law in using U.S. patent law to create domestic competitive advantage).
2011 the U.S. Patent Office issued 108,626 patents to U.S. inventors and 111,822 patents to foreign inventors.\textsuperscript{200} If improvements to the procedures at the U.S. Patent Office increase the rate at which it issues patents by 10\%, U.S. inventors would receive 10,863 more patents, while foreign inventors would receive an even larger increase of 11,182 more patents. As a result, the improvements to the U.S. patent office would extend the lead of foreign inventors over U.S. inventors by an additional 319 U.S. patents. Similarly, foreign inventors would benefit more if the cost of obtaining U.S. patents declines. If the cost of obtaining a U.S. patent in 2011 had been $10 less, foreign inventors as a group would have saved more than $30,000 more than U.S. inventors. Improving the functioning of the U.S. Patent Office may particularly disfavor U.S. inventors in technological fields in which foreign inventors obtain substantially more U.S. patents than domestic inventors.\textsuperscript{201} Within these fields, the magnification of patenting disparities discussed above would be particularly dramatic.\textsuperscript{202} In other words, the U.S. Patent Office cannot

\begin{itemize}
  \item \textsuperscript{200} \textit{Id.}
  \item \textsuperscript{201} The U.S. Patent Office categorizes patents into approximately four hundred technology classes, although this classification system “is based primarily on technological and functional principles and is only rarely related to only loosely related to economists’ notions of products or well-defined industries (which may be a mirage anyway).” Griliches, \textit{supra} note 73, at 1666. In 2010, more U.S. patents issued to foreign inventors than domestic inventors in many of these classes. \textit{See} Patent Tech. Monitoring Team, \textit{Patenting In Technology Classes, Breakout by Geographic Origin (State and Country)}, U.S. PATENT & TRADEMARK OFF., \texttt{http://www.uspto.gov/web/offices/ac/ido/oeip/taf/tecstc/clstc_gd.htm} (last modified Apr. 1, 2011). Some significant technology classes which U.S. inventors substantially trail foreign inventors in obtaining U.S. patents include: Dynamic Information Storage or Retrieval; Dynamic Optical Information Storage or Retrieval; Electrical Generator or Motor Structure; Electric Lamp and Discharge Devices; Electricity: Motive Power Systems; Incremental Printing of Symbolic Information; Chemistry: Electrical Current Producing Apparatus, Product, and Process; Televisions; Liquid Crystal Cells, Elements and Systems; Optics: Image Projector; Photocopying; Facsimile and Static Presentation Processing; Optics: Systems and Elements; Motion Video Signal Processing for Recording or Reproducing; Photography; Electrophotography; Radiation Imagery Chemistry; Process, Composition, or Product Thereof. \textit{Id.} In classes where U.S. inventors lag behind foreign inventors, those foreign inventors frequently are often from Japan, South Korea, Taiwan, or Germany. \textit{Id.}
  \item \textsuperscript{202} \textit{See supra} note 198 and accompanying text.
\end{itemize}
save dying domestic industries by improving processes contributing to their decline.  

The second reason that improving procedures at the U.S. Patent Office may not create significant domestic competitive advantage is that U.S. and foreign inventors may react differently to such improvements. For example, even if the shift to a first-to-file system ultimately improves the efficiency of procedures at the U.S. Patent Office, U.S. inventors may initially face additional costs in that many U.S. inventors must learn the new first-to-file system. In contrast, because almost every foreign patent system is already a first-to-file system, foreign inventors may not face similar obstacles. Even within fields in which U.S. inventors dominate and thus would benefit from the magnification principles discussed above, improving processes within the U.S. Patent Office may help foreign inventors more than domestic inventors if foreign inventors are more sensitive to changes in administrative delays, costs, or accuracy. In that case, improvements in U.S. Patent Office procedures might increase patenting by U.S. inventors but increase even more patenting in the United States by foreign inventors.

In sum, it is unclear whether typical approaches to improving the processing of applications by the U.S. Patent Office will provide domestic

\[\text{supra} \text{ note } 87 \text{ and accompanying text.}
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\[\text{supra} \text{ note } 176 \text{ and accompanying text.}
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\[\text{supra} \text{ note } 121, \text{ at } 703-06 \text{ (noting that global harmonization of patent law may be suboptimal because of differences between different countries, including culture).}
\]
\[\text{supra} \text{ note } 198 \text{ and accompanying text.}
\]
\[\text{supra} \text{ note } 135, \text{ at } 24 \text{. If foreign inventors are more sensitive to changes in patenting costs, their supply curve for U.S. patents will be more elastic. If domestic inventors are less sensitive to changes in patent costs, then their curve for supplying U.S. patents will be less elastic.} \]
businesses and inventors with meaningful competitive advantages. Improving procedures at the U.S. Patent Office should help U.S. inventors, but because many foreign inventors also use the U.S. patent office, such improvements will also help foreign inventors, and therefore may not significantly affect U.S. competitiveness in global markets.  

**C. Selectively Expediting Patent Applications**

Another potential way to favor U.S. inventors may be to streamline and to improve patent processes in particular industries in which U.S. inventors and U.S. businesses already enjoy a competitive advantage. Many factors contribute to competitive advantage, and different countries are successful in creating competitive advantages in different industries. For example, U.S. companies have been effective in producing medical equipment and pharmaceuticals. Reducing the costs and delays of patents in these areas should increase to some extent the incentives to invent within these industries. Because U.S. businesses already

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208 The effect of the America Invents Act on U.S. competitiveness may also be affected by certain inventor demographics. For example, inventors starting new businesses may focus on obtaining patents in their home countries. If so, improving the workings of the U.S. Patent Office, would favor U.S. inventors hoping to start new businesses without simultaneously favoring foreign inventors. See supra note 207.

209 It is not entirely clear whether expediting innovation only within certain industries is not protectionism. If the patent office expedites only certain patent applications, other applications may not be processed as quickly as they might have been. At the very least, however, selectively expediting patent processes is not facially protectionist.

210 PORTER, supra note 10, at 196-197.


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dominate these industries, the effects of these enhanced incentives to invent may be felt most strongly by U.S. inventors and U.S. businesses.\textsuperscript{213}

Recently, the U.S. Patent Office has developed two programs that streamline patent procedures in certain industries. In 2006, the U.S. Patent Office started the Accelerated Examination Program, under which the Patent Office accelerates the examination of applications that are particularly amenable to faster resolution.\textsuperscript{214} To qualify for this program, an inventor generally must pay an additional fee, but the Patent Office waives the requirement for an additional fee if the invention “(i) [e]nhance[s] the quality of the environment; (ii) [c]ontribute[s] to the development or conservation of energy resources; or (iii) [c]ontribute[s] to countering terrorism.”\textsuperscript{215} Similarly, in 2010, the U.S. Patent Office implemented a program to accelerate the patenting of inventions “pertaining to green technologies including greenhouse gas reduction (applications pertaining to environmental quality, energy conservation, development of renewable energy resources or greenhouse gas emission reduction).”\textsuperscript{216} The program is intended to “accelerate the development and deployment of green technology, create green jobs, and promote U.S. competitiveness in this vital sector.”\textsuperscript{217} The program is limited to processing only 3,500 patent applications and will end by March 30, 213\textsuperscript{213} See supra note 198 and accompanying text (arguing that traditional improvements to U.S. patent law magnify existing disparities in the acquisition of U.S. patents); see also supra note 151 and accompanying text (discussing the importance of factors extrinsic to law in using U.S. patent law to create domestic competitive advantage).

\textsuperscript{214} For example, to qualify for the Accelerated Examination Program, an inventor must file an application electronically, the application must contain only a limited number of patent claims, the inventor must agree to have an interview with the patent examiner, and the inventor must provide a statement that a pre-examination search for prior art was conducted. U.S. Patent and Trademark Office, Manual of Patent Examination and Procedure § 708.02(a) (8th ed. 8th rev. 2010).


Nevertheless, the U.S. Patent Office likely will develop additional programs to expedite patent examination in certain industries. The recent America Invents Act gives the Director of the Patent Office the power to prioritize the “examination of applications for products, processes, or technologies that are important to the national economy or national competitiveness.” By expediting the examination of inventions for “products, processes, or technologies” in which U.S. inventors already enjoy competitive advantages, the U.S. Patent Office may be able to magnify those competitive advantages.

Although expediting patent examination within certain industries thus may help U.S. inventors, these potential benefits should be weighed against four potential pitfalls. First, identifying which areas of technology to expedite may be difficult. In some industries, U.S. companies may only have a competitive advantage in certain market segments. For example, the U.S. commercial airplane industry may be well positioned to compete in the market for long-range commercial jets but not smaller, short-range commuter jets. Second, even when areas of U.S. competitive advantage can be identified, U.S. industries could lose that advantage regardless of favorable patent laws. Reducing the cost and delay of patenting in certain industries may encourage foreign inventors and businesses to focus on these industries, speeding the decline of once-dominant U.S. companies. In such a situation, expediting patent processes eventually would magnify the competitive advantages of foreign inventors. Consequently, to enhance existing domestic competitive advantage, lawmakers likely would need to monitor constantly the performance of U.S. innovators and change quickly which industries are expedited. Third, even if the U.S. Patent

220 As indicated infra notes 279 to 280 and accompanying text, this approach may also foster norms that support innovation.
221 The impact of changes in patenting costs within certain industries will depend on the cross-elasticity of demand for foreign and domestic inventors. See supra note 207 and accompanying text.
222 Indeed, because of the difficulties of foreseeing future changes related to technology, technology-specific patent laws are often disfavored. BURK & LEMLEY, supra note 44, at 98-99 (“The history of industry-specific statutes suggests that many fail
Office could implement a system that effectively expedites patent processes in appropriate industries, other countries might enact reciprocal measures, thereby reducing U.S. prosperity. For example, the Korean Patent Office might enact similar provisions to enhance within certain industries the competitive advantage of Korean inventors over U.S. inventors. Finally, selectively expediting invention in certain industries may violate TRIPS, which prohibits “discrimination” in the availability of patents based on “the field of technology.” If so, countries who are members of the World Trade Organization may seek sanctions against the United States for expediting patent examinations within certain industries.

Because of these challenges to obtaining domestic competitive advantage by expediting innovation, the U.S. Patent Office should be cautious in selecting industries in which to expedite patent examinations. The U.S. Patent Office should only expedite examinations in an area of technology following a careful analysis of the resulting costs and benefits, including effects on competitive advantage. One approach would be to focus on expediting examination in a small number of industries in which the United States appears to have a clear competitive advantage. For example, between 2006 and 2010, approximately 80% of U.S. patents on surgical instruments issued to U.S. inventors. By focusing on technological areas in which U.S. competitive advantage is clear, like surgical instruments, the U.S. Patent Office can reduce the likelihood of inadvertently magnifying the competitive advantage of foreign inventors. Also, by limiting the number of affected industries, the U.S. Patent Office would reduce both the chance of widespread retaliation by foreign patent offices and the likelihood that a foreign country will invoke the dispute resolution mechanisms of TRIPS. Unfortunately, if the U.S. Patent Office

\[223\] TRIPS Agreement, supra note 120, art. 27.1. This provision of TRIPS, however, relates to “Patentable Subject Matter,” and therefore may not govern procedures for obtaining patents.

expedites patent examination in only a small number of technology areas, the competitive benefits to domestic inventors and businesses of such a focused program will be limited.

V. CHANGING U.S. CULTURE

Some have called for a change in U.S. culture to boost U.S. innovation.225 For example, economist Tyler Cohen has argued that, to obtain economic prosperity, we should “[r]aise the social status of scientists.”226 President Obama made a similar appeal in his 2011 State of the Union Address: “We need to teach our kids that it’s not just the winner of the Super Bowl who deserves to be celebrated, but the winner of the science fair.”227 Innovation analysts likewise have argued that culture “play[s an] indispensable role[] by training, inspiring, and motivating the innovators of the future.”228 Because of the domestic competitive advantage created by typical approaches to improving patent law is limited, non-traditional uses of patent law should be considered, such as the use of U.S. patent law to create a culture in the United States that fosters innovation.

225 “Culture” is difficult to define precisely. See GEERT HOFSTEDE, CULTURE’S CONSEQUENCES: INTERNATIONAL DIFFERENCES IN WORK RELATED VALUES 25 (1980) (describing cultural values as “the collective programming of the mind which distinguishes the members of one human group from another”); Maike Didero et al., Differences in Innovation Culture Across Europe 4 (2008) (collecting numerous definitions of culture used by sociologists); Stephen L. Mueller & Anisya S. Thomas, Culture and Entrepreneurial Potential: A Nine Country Study of Locus of Control and Innovativeness, 16 J. BUS. VENTURING 51, 58 (2000) (same).


228 ESTRIN, supra note 2, at 4; KAO, supra note 10, at 266 (discussing adjustments to American values related to innovation); INNOVATE AMERICA, supra note 9, at 8; PORTER, supra note 10, at 30, 113-115; DAVID SHENK, THE GENIUS IN ALL OF US: NEW INSIGHTS INTO GENETICS, TALENT, AND IQ 144 (2011) (“It must not be left to genes and parents to foster greatness; spurring individual achievement is also the duty of society. Every culture must strive to foster values that bring out the best in its people.”); see also CSIKSZENTMIHALYI, supra note 146, at 325 (“The culture that survives to direct the future of the planet will be one that encourages as much creativity as possible . . . .”); SCOTT BERKUN, THE MYTHS OF INNOVATION 117 (2010) (arguing that culture impacts a society’s receptiveness to new ideas).
A. Law and Culture

Because law and culture are interrelated, each can affect the other. For instance, racist cultural views contributed to the passage of laws requiring racial segregation in education, while beliefs in equality contributed to desegregation. Similarly, legal scholars have identified complex interactions between law and norms, including numerous mechanisms by which law may affect social norms. For example, de jure racial segregation in education likely affected behavior outside of schools by reinforcing racist social norms.

One important way that law can affect culture is by impacting the “social meaning” of an activity. Many actions convey a “social meaning” in that performing the action expresses certain attitudes and commitments. Social meanings therefore form part of the costs and benefits associated with an action, and some people will avoid performing

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232 Brown v. Bd. of Educ., 347 U.S. 483, 494 (1954) ("Segregation of white and colored children in public schools has a detrimental effect upon the colored children. The impact is greater when it has the sanction of the law; for the policy of separating the races is usually interpreted as denoting the inferiority of the negro group.").
233 See Lessig, *supra* note 231, at 951, 965 (suggesting that these laws can be used by individuals or groups “to advance individual or collective ends”); see also id. at 591 (“[I]t is beyond cavil that ‘the linguistic meaning of governmental action can have a moral impact.’”) (quoting Matthew D. Adler, *Expressive Theories of Law: A Skeptical Overview*, 148 U. PA. L. REV. 1363, 1494 (2000)); Sunstein, *Social Roles*, *supra* note 231, at 949 (noting that government may use vivid images and rhetoric as a means of affecting social norms).
234 Lessig, *supra* note 231, at 951 (defining “social meaning[]” as the “semiotic content attached to various actions”); see also Sunstein, *Social Roles*, *supra* note 231, at 925–28.
an action in order to avoid expressing the character traits, commitments, or connotations included in the social meaning of that action.\textsuperscript{235} For example, at one point, smoking cigarettes may have expressed sensuality, sophistication, and independence.\textsuperscript{236} At that time, more people were likely to smoke because of these positive social meanings. Today, however, many people associate smoking with deleterious health effects.\textsuperscript{237} Because smoking has a more negative social meaning today, people tend to be less inclined to smoke.

Perhaps the simplest way that law can affect the social meaning of an activity is by criminalizing it. Such a law may give the activity a negative social meaning.\textsuperscript{238} For example, criminalizing driving while under the influence of alcohol may cause the social meaning of drunk driving to become more negative and therefore may dissuade people from engaging in the prohibited conduct.\textsuperscript{239} In addition to affecting social meanings, a law will also “publicize” a social view. In a majoritarian government, a law criminalizing an activity indirectly indicates that many

\textsuperscript{235} Lessig, supra note 231, at 956–58, 1001; see also Harry Surden, Structural Rights in Privacy, 60 SMU L. Rev. 1605, 1610 (2007) (“[S]ocial norms impose social costs . . . .”).

\textsuperscript{236} See Meghan Daum, Smoking’s Sinful Sensuality in Movies, L.A. TIMES, May 19, 2007, at A23 (discussing the connection between the portrayal of smoking and sensuality in film.).

\textsuperscript{237} See Sunstein, Social Roles, supra note 231, at 926 (explaining that in the United States as opposed to other countries, smoking cigarettes may signal “something relatively precise and very bad” about an individual’s “self-conception” and “concern for others”); Lessig, note 231, at 1017; see also id. at 963, 1008 (noting that the perceived legitimacy of a law affects its capacity to connect specific actions to broad norms).


\textsuperscript{239} This understanding of the social meaning of crime perhaps explains why some people assert that activities that are not crimes in fact are not crimes. For example, the website http://www.privacyisnotacrime.com asserts the that “privacy is not a crime.” The website does not contend that under the current law privacy is in fact a crime. Rather, the website contends that people should have stronger rights to privacy. PRIVACY IS NOT A CRIME, http://www.privacyisnotacrime.com (last visited Dec. 19, 2011); see also SKATEBOARDING IS NOT A CRIME, http://www.skateboardingisnotacrime.com (last visited Dec. 19, 2011) (asserting that skateboarding is not a crime); PHOTOGRAPHY IS NOT A CRIME, http://www.photographyisnotacrime.com (last visited Dec. 19, 2011) (photography).
people believe the activity already has a negative social value.\textsuperscript{240} For example, a law criminalizing drunk driving indicates that many people disfavor such behavior. Even if a DUI law does not affect an individual’s personal evaluation of the meaning of drunk driving, the law may affect that individual’s expectations regarding others’ beliefs. In the face of a criminal DUI statute, an individual may avoid driving intoxicated to avoid social sanctions from others.\textsuperscript{241}

Another way that law can affect the social meaning of an activity is by “tying” that activity to another aspect of society that has an established social meaning.\textsuperscript{242} For example, a proponent of a ban on flag burning may claim that the ban will promote a widely held value like patriotism. Similarly, opponents to such a ban may claim that the ban would undermine the different goal of liberty. Regardless of the truth of these empirical claims, support for the ban can be impacted by its perceived connection to patriotism or liberty. The success of an effort to affect social meaning through tying depends therefore in part upon the perceived legitimacy of the tying.\textsuperscript{243}

Social meaning is closely linked to the concept of salience, which describes the extent to which the public pays attention to an issue.\textsuperscript{244} “Due to limited attention span, apprehension, and information processing abilities, individuals can only process a limited number of ideas at any

\textsuperscript{240} Geisinger, \textit{supra} note 229, at 64-65, 70; McAdams, \textit{Attitudinal Theory}, \textit{supra} note 231, at 358. This inference is undermined if some people cannot or do not vote or if the validity of the vote count is suspect.

\textsuperscript{241} Law may also affect activities with positive social meanings. For instance, allowing taxpayers to deduct charitable contributions from their taxable income may help to give such contributions a positive social meaning and may indicate that many people will believe such contributions already have a positive social meaning.

\textsuperscript{242} Lessig, \textit{supra} note 231, at 1009.

\textsuperscript{243} Lawrence Lessig has argued that when government attempts to change social norms, there is a risk of causing an “Orwell effect: when people see that the government or some relatively powerful group is attempting to manipulate [norms], they react strongly to resist any such manipulation.” Lessig, \textit{supra} note 231, at 1017; \textit{see also} \textit{id. at} 963, 1008 (noting that the perceived legitimacy of a law affects its capacity to connect specific actions to broad norms). As a result of the Orwell effect, the government may have an incentive to minimize the extent to which its message seems to be from the government. \textit{Id. at} 1017–18.

\textsuperscript{244} \textit{Id.}
single time.”

New legislation can raise the salience of the issues addressed by those laws, particularly if politicians discuss the legislation in high-profile contexts. Moreover, the salience of an issue can be affected through tying: associating an activity with a high-salience issue can increase the activity’s salience. For example, a connection between the war on terrorism, which arguably has high salience, and the war on drugs may increase the salience of the latter.

B. Culture and Innovation

Culture affects competitive advantage in innovation in at least three respects. First, countries may develop innovative industries related to activities that are particularly important in that culture. “[N]ations tend to be competitive in activities that are admired or depended upon; that is where the heroes come from.” For example, Americans’ love of sports has likely contributed to the success of U.S. businesses in producing athletic products. The United States is home to the corporate headquarters for three of the top four manufacturers of sporting equipment: Nike, Reebok, and Under Armour. With national passions like this, a substantial portion of the domestic labor market may participate in the activity, and domestic businesses therefore benefit from access to labor with skills and knowledge tailored to the industry. Domestic businesses are also well-positioned to monitor domestic

245 Id.
246 Id. (noting that “passage of a law many not be the main source of information” regarding a law and that “publicity about the reasons for the passage of law will be the main source of information”); see also ESTRIN, supra note 2, at 159 (“The role of a nation’s leaders is to foster the right environment for innovation through inspiration, funding, and policy.”).
247 This list is not exclusive; many factors potentially affect innovation.
248 PORTER, supra note 10, at 91.
249 Id. at 115.
250 Id. at 91.
consumer demand, and, because domestic demand for industries related to national passions is sophisticated, global demand trends may trail domestic trends. By focusing on domestic demand, domestic industries related to national passions are able to anticipate (and perhaps influence) changes in global demand. “If prestige and national priority favor an industry, the ripple effect on competitive advantage can be enormous.”

The second manner in which culture can affect innovation is that some societies foster “inventing norms,” which generate praise and respect for innovators. In cultures with such norms, inventors receive additional benefits from their discoveries in the form of enhanced social status. There are good reasons to believe that inventing norms are widely accepted and enforced in the United States. For example, successful innovators in the United States are often publicly praised. When Thomas Edison died, President Herbert Hoover turned off all of the lights in the White House for one minute. More recent examples of innovators who achieved celebrity status include Bill Gates (founder of Microsoft, Inc.), Steve Jobs (co-founder of Apple, Inc.), and Mark Zuckerberg (founder of Facebook, Inc.). Reactions to the death of Steve Jobs reveal the extent to which he was widely esteemed even outside of technology circles. The day he died, Jobs was praised by President Obama as “exemplif[ying] the spirit of American ingenuity.” Mainstream media also praised Jobs as a

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252 PORTER, supra note 10, at 86-90.
253 Id. at 115.
254 Id. at 115.
255 BERKUN, supra note 228, at 113 (“Americans holding ingenuity to be one of the best kinds of goodness . . . .”); see generally Hubbard, supra note 155, at 378-88 (discussing inventing norms).
256 Id. at 73 (“Innovators became easy heroes in America . . . .”).
“visionary,” likening him to Thomas Edison, Henry Ford, and John D. Rockefeller.

A third way in which culture contributes to competitive advantage in innovation also involves social norms. Inventing norms directly praise innovation, but other social norms may encourage activities and values that indirectly encourage innovation. For example, a society in which education and hard work are lauded may produce greater numbers of creative, educated, skilled citizens, which may help domestic businesses develop new technologies, and create domestic demand for those technologies.

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261 See ESTRIN, supra note 2, at 7-33 (arguing that certain values contribute to innovation). Other social norms may hamper invention. For example, social norms based on erroneous stereotypes may dissuade women from pursuing careers in science and invention. See AUGUSTINE, supra note 10, at 48 (“Women constitute 46% of the US workforce, but only 23% of the science and engineering workforce.”); JOHN P. WALSH & SADAO NAGAOKA, WHO INVENTS?: EVIDENCE FROM THE JAPAN-US INVENTOR SURVEY 9 (RIETI discussion paper series, 09-E-034, 2009), available at http://www.rieti.go.jp/jp/publications/dp/09e034.pdf (reporting that only five percent of U.S. patentees are women).

262 See AUGUSTINE, supra note 10, at 69 (“Patience, continuity, and their close relative perseverance are all fundamental catalysts of successful innovation.”); BERKUN, supra note 228, at 172 (“Study the histories of great creators, and you’ll find a common core of willpower and commitment as their driving force.”); ČSIKSZENTMICHÁLYI, supra note 146, at 61 (noting that creative, successful individuals are often tenacious workers); PORTER, supra note 10, at 114 (“In no small part, a nation’s success depends on the types of education that . . . talent chooses to obtain and where it chooses to work.”).

263 ESTRIN, supra note 2, at 170 (“One of the most significant factors in deciding where to locate an R&D center is a strong research community and talent base.”); Porter & Stern, supra note 75, at 29; Scott Shane, Cultural Influences on National Rates of Innovation, 8 J. BUS. VENTURING 59, 63 (1993) (noting that “[i]nnovation requires skilled engineers and scientists”) [hereinafter Shane, Innovation].

264 PORTER, supra note 10, at 95 (“Provided it anticipates buyer needs in other nations, early local demand for a product or service in a nation helps local firms to move sooner than foreign rivals to become established in an industry.”).
Sociological studies have identified “innovation values,” which are broad cultural characteristics that correlate with innovation. These studies begin by determining the extent to which certain cultural characteristics are present in some countries and absent from others, and then correlate these characteristics with a country’s innovation output. In determining national characteristics to test for correlations with innovation, sociologists often rely on a system of cultural characteristics developed by Geert Hofstede. For example, “individualism” is one of Hofstede’s cultural characteristics. In highly individualistic cultures, people prefer to act in the interests of themselves and their families rather than acting in the interests of a larger group of people. Another important cultural dimension developed by Hofstede is tolerance of “power distance,” which describes the extent to which people from a country accept inequality in power between people. A country that exhibits significant power distance embraces hierarchy and resists change. In non-power distant countries, “people believe in shared power, equality, and social mobility.” Using survey responses from more than 80,000 people from thirty-three different countries, Hofstede determined the extent to which these countries exhibited certain cultural characteristics, including individualism and power distance.

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266 See generally GEERT HOFSTEDE, CULTURE’S CONSEQUENCES: INTERNATIONAL DIFFERENCES IN WORK RELATED VALUES (1980) (describing Hofstede’s system for classifying cultures).

267 Shane, Innovation, supra note 263, at 60-61.

268 Id.

269 Shane, Invent, supra note 265, 30.

270 Shane, Innovation, supra note 263, at 61.

271 Shane, Invent, supra note 265, at 31.

272 Id. at 30. A single country may contain multiple cultures, though Hofstede’s categorization of countries does not reflect this possibility. Didero, et al., supra, at 3.
Building on Hofstede’s work, sociologists have identified statistically significant correlations between high levels of innovation and two cultural characteristics: high levels of individualism and low tolerance of power distance. For example, Scott Shane has identified a positive correlation between per capita patenting rates and individualism and a negative correlation between per capita patenting rates and tolerance for power distance. Although these studies demonstrate only correlations between these cultural characteristics and innovation, these correlations suggest that encouraging individuality and limiting power distance may support innovation. Indeed, these results are consistent with other scholarship arguing that autonomy, independence, and freedom facilitate innovation and that hierarchy, inequality, and lack of communication between superiors and subordinates slow innovation.

C. Patent Law and Innovation Culture

Like other types of law, patent law can affect culture. In particular, its effects on social meaning and salience can impact the cultural features identified in the previous section that correlate with

273 Sociologists measure innovation in different ways. See, e.g., KAASA & VADI, supra note 265, at 588 (using patent applications in the European Patent Office); Mueller & Thomas, supra note 225, at 51 (survey data); Shane, Invent, supra note 265, at 29 (per capita patent rates); Shane, Innovation, supra note 263, at 64 (per capita trademark rates); Sun, supra note 265, at 353 (a blended innovation index).

274 Kaasa & Vadi, supra note 265, at 592; Mueller & Thomas, supra note 225, at 51: Shane, Invent, supra note 265, at 29 (per capita patent rates); Shane, Innovation, supra note 263, at 67; Sun, supra note 265, at 353 (analyzing whether Hofstede’s cultural characteristics correlate with a “national innovation capability index”); see also ESTRIN, supra note 2, at 18 (arguing that “openness” contributes to innovation); KAO, supra note 10, at 23, 59, 156 (same). But see Kaasa & Vadi, supra note 265, at 592 (reporting that “individualism appears to have a much weaker or non-existent relationship with patenting intensity”).

275 Shane, Invent, supra note 265, at 29. These correlations remain statistically significant even when adjusted for wealth. Id. at 38. In a later study, Shane also considered whether individualism and power distance correlated with per capita trademarking rates. Shane, Innovation, supra note 263, at 64.

276 ESTRIN, supra note 2, at 104 (“To take root, innovation requires flexible, open, less hierarchical processes.”); Kaasa & Vadi, supra note 265, at 585-87; Shane, Innovation, supra note 263, at 61 (1993); (collecting sources); Shane, Invent, supra note 265, at 33-35 (same).

277 Shane, Innovation, supra note 263, at 61 (collecting sources); Shane, Invent, supra note 265, at 31-33 (same).
competitive advantage and innovation: national passions, inventing norms, and innovation values.

For example, the expressive aspects of patent law may affect which activities are considered national priorities. As discussed above, under the new America Invents Act, the Director of the U.S. Patent Office has the power to declare that certain “products, processes, or technologies . . . are important to the national economy or national competitiveness.”

Within these technological areas, the Director may accelerate the processing of patent applications. By declaring that certain areas of technology are national priorities, the U.S. Patent Office may improve the social meaning of working within those industries and also increase the salience of those positive social meanings. Even if the magnitude of these effects is not be large, the U.S. Patent Office may be able create marginal improvements in the social meaning and salience of an industry, thereby marginally improving both the domestic labor market for that industry and the sophistication of domestic demand for the industry’s products or services.

Patent law also may affect social norms that favor and encourage inventing. In an earlier article, I described in detail many ways that patent law can influence these norms. Although, I will not repeat those arguments here, the recent changes to U.S. Patent law in the America Invents Act illustrate some of the ways that patent law may affect innovation culture. To start, the signing of a law with a title that explicitly associates America with invention may increase the salience of invention in American society, particularly given the current rarity of bi-partisan

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279 See supra note 219 and accompanying text. For a critique of this approach, see supra notes 219 to 224 and accompanying text.
280 See notes 248 to 254 supra and accompanying text (discussing the competitive advantages associated with national passions). But see notes 292 to 300 infra and accompanying text (discussing concerns regarding the magnitude of the impact of U.S. patent law on U.S. culture).
281 See generally Hubbard, supra note 155. For example, awarding patents helps to enforce inventing norms because a patent signals to a broad audience that the patent recipient has discovered a new invention. Id. at 398-403.
agreement. Furthermore, the Act may have also helped to give invention a positive social meaning because politicians have used the Act to connect invention to economic prosperity, which possesses positive social meaning and exceptionally high salience in the current economic downturn. When the Act was introduced in the Senate, Senator Patrick Leahy asserted that the Act is “a measure that will help create jobs, energize the economy, and promote innovation.” Likewise, when the Act was introduced in the House of Representatives, Representative Lamar Smith stated that “[t]his legislation is crucial for American economic growth, jobs, and the future of U.S. competitiveness.” After the Act passed both the house and the Senate, President Obama quickly signed it, declaring that the Act will “help give entrepreneurs the protection and the confidence they need to attract investment, to grow their businesses, and to hire more workers.” News agencies widely repeated the asserted connection between the America Invents Act and economic prosperity.

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283 157 Cong. Rec. S936-02. Senator Orrin Hatch similarly asserted that the legislation would “help strengthen our economy.” Id.

284 157 Cong. Rec. H4420-06.


286 See, e.g., Michael A. Memoli & Peter Nicholas, *Obama signs patent overhaul law, pushes jobs act*, L.A. TIMES (Sept. 16, 2011),
statements of politicians regarding the economic goals of the legislation, may help to give invention a positive social meaning, thereby fostering a culture in the United States that is conducive to innovation.

Finally, patent law can also support broad cultural values that correlate with high rates of innovation, such as individualism and small power distance. For example, the treatment of independent inventors under U.S. patent law supports these values. U.S. patent law provides independent inventors with significant assistance in obtaining patents. For instance, independent inventors pay smaller fees in the U.S. Patent Office.\textsuperscript{287} The America Invents Act will further reduce the fees paid by some independent inventors.\textsuperscript{288} In addition, the America Invents Act establishes a “Patent Ombudsman Program,” and the sole objective of this program is “providing support and services relating to patent filings to small business concerns and independent inventors.”\textsuperscript{289} The U.S. Patent Office also devotes a portion of its website to helping independent inventors.\textsuperscript{290} By singling out and supporting certain inventors because of their independence, U.S. patent law financially encourages “independence” and also expresses broad public support for it. Similarly, these same provisions of patent law express support for small power distance because independent inventors seek to prosper through the quality of their ideas, not through advantages based on social hierarchy.\textsuperscript{291}

\begin{footnotesize}
\begin{itemize}
\item[\textsuperscript{287}] http://articles.latimes.com/2011/sep/16/news/la-pn-obama-patent-20110916 (noting that President Obama asserted that patent reform is “a common-sense step to boost the economy”); Darlene Superville, Obama Signs 1st major patent law change since 1952, Associated Press, Sept. 16, 2011 (reporting that the Act “has been hailed as a milestone that will spur innovation and create jobs”).
\item[\textsuperscript{288}] 35 U.S.C. 41(h) (stating that an “independent inventor” shall have fees “reduced by 50 percent”).
\item[\textsuperscript{291}] Shane, Innovation, supra note 263, at 61; Shane, Invent, supra note 265, at 31.
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D. The Magnitude of Cultural Effects of Patent Law

The impact of U.S. patent law on culture is likely larger in the United States than other countries for two reasons. First, U.S. law and the actions of U.S. politicians provide more information regarding the opinions of U.S. voters than the beliefs of citizens of a foreign country because democratic elections generally encourage politicians to conform their behavior to their constituents’ beliefs. As a result, U.S. laws and statements by U.S. politicians promoting invention signal that many U.S. citizens believe that invention is highly salient and imbued with positive social meaning. A person in the United States therefore may be encouraged to try to discover a new invention by the increased expectation of praise for her efforts. In contrast, a U.S. law favoring invention would be less likely to cause a person in China to expect praise from Chinese citizens.

A second reason that the expressive impact of U.S. patent law is larger in the United States than in other countries is that U.S. citizens are more likely than foreigners to learn U.S. law or scrutinize the actions of U.S. politicians. U.S. citizens can more easily follow developments in U.S. law through popular media and without the need for translation. Moreover, the benefits from monitoring U.S. law (or costs for ignoring it) are frequently greater for U.S. citizens than foreigners because much U.S. law has little extraterritorial impact and because citizens can vote disfavored politicians out of office. Citizens of foreign countries may benefit less from efforts to understand U.S. law because they are unaffected by those laws or unable to change them.

One group of foreign citizens nevertheless may be highly responsive to the expressive impact of U.S. patent law: foreign applicants for U.S. patents. These foreign citizens may closely monitor U.S. patent law and may benefit from certain value-laden portions of the patent act.

292 U.S. politicians may be concerned about other actions by foreign countries and their citizens, including economic and military reactions to U.S. laws.

293 Many foreigners closely monitor U.S. politics, and increasing the salience of an issue in United States might raise the salience of the issue in another country, particularly if that country enacts new laws in response to U.S. legislation.
such as the provisions favoring independent inventors. Nevertheless, even if foreign applicants for U.S. patents closely track U.S. patent law and politics, the expressive impact of U.S. patent law likely will be largest in the United States because the expressive impact of U.S. patent law in the United States extends to non-inventors. For example, even people who have never applied for a patent may laud a successful innovator. The reaction to the death of Steve Jobs in mainstream media demonstrates the extent to which even technophobes may respect innovators. Furthermore, the social meaning of invention can affect whether people strive to become inventors in the first place. Improving the social meaning of invention among children and students may encourage some of them to pursue inventive careers. The benefits of using U.S. patent law to shape culture are thus larger in the United States than in any other country.

Nevertheless, it is difficult to measure the extent to which U.S. patent law can affect culture in a way that promotes domestic competitive advantage. “Values and norms are powerful forces for controlling and directing human behavior,” but it is not clear to what extent U.S. patent law can shape these values and norms rather than merely reflect them.

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294 See supra notes 287 to 291 and accompanying text.
296 Some foreign countries are actively trying to shape their culture related to innovation. For example, in 2010 Malaysia established the Malaysia Innovation Agency, which is a governmental entity whose responsibilities include “[p]romoting the culture of innovation in the public and private and education sectors in Malaysia.” Lee Tatt Boon, Attaining High Income Through Innovation, 25 WORLD INTELL. PROP. REP. 40 (BNA) (2011).
297 Mueller & Thomas, supra note 225, at 58; accord SHenk, supra note 228, at 151 (“Our cultural landscape directly affects whether and how people challenge themselves and others to achieve.”).
298 Indeed, some expressive effects of law could undermine innovation. For example, some scholars have argued that granting patents for academic discoveries undermines social norms that encourage scientists to collaborate with each other. See
Moreover, the cultural impact of certain aspects of patent law likely diminish over time. Today, the America Invents Act and the high-publicity attention that politicians have given the Act probably have worked together to increase the salience of inventing in American society and to ensure that the social meaning of invention is positive. However, Congress cannot credibly pass a major patent reform bill every year; when laws are perceived as lacking legitimacy, they may have little impact on culture.\footnote{299} Furthermore, the America Invents Act changed U.S. patent law to be more consistent with the patent laws of other countries. As the patent laws of more countries align, their cultural effects may do the same.\footnote{300} The cultural impact of U.S. patent law therefore may not provide

\footnote{299} See, e.g., POSNER, supra note 231, at 99 (discussing the relationship between the distrust of the government and the internalization of the values of a law in the context of shaming punishments); Geisinger, supra note 229, at 68 (describing the process of norm internalization associated with popular understandings of wearing a motorcycle helmet); Holbrook, supra note 231, at 592 (noting the impact laws can have on individual perceptions of societal norms); McAdams, \textit{Attitudinal Theory}, supra note 231, at 358–59 (discussing the importance of “legitimacy” in the expressive theory of law); see also Ben Depoorter \& Sven Vanneste, \textit{Norms and Enforcement: The Case Against Copyright Litigation}, 84 OR. L. REV. 1127, 1139-40 (2005) (discussing law, norms, and legitimacy in the copyright context); Lucas Osborn, \textit{Instrumentalism at the Federal Circuit}, 56 St. Louis U. L.J. __, __ (2012) (discussing judicial decisions and legitimacy).

\footnote{300} Some countries arguably have gone further than the United States in using law to promote values related to innovation. For example, Finland has “enshrine[d] in Law Internet access as a basic human right.” ECONOMIST INTELLIGENCE UNIT, \textit{DIGITAL ECONOMY RANKINGS 2010: BEYOND E-READINESS} 8 (2010).
significant long-term competitive advantage if the patent laws of other countries provide their citizens with similar advantages.

VI. CONCLUSION

Innovation is critical to the success of U.S. businesses in global markets. Because patent law is an important mechanism for promoting innovation, changes to U.S. patent law might create competitive advantages for U.S. innovators. Because both foreign and domestic innovators use the U.S. patent system, one potential mechanism for boosting domestic innovation is to favor U.S. inventors explicitly through protectionist patent laws. Though the United States has a long history of embracing protectionist patent law, the costs of such protectionism outweigh the expected benefits. Protectionism generally reduces domestic welfare by raising prices for domestic consumers and by insulating U.S. businesses from the competitive pressures that drive innovation.  

In addition, if the United States were to enact protectionist patent law, the United States would violate international treaties, risking retaliatory action by our trade partners.

Another potential mechanism for using U.S. patent law to create domestic competitive advantage focuses on traditional approaches to improving the processes of the U.S. Patent Office: making these processes faster, cheaper, and more accurate. U.S. political leaders implicitly contend that the recent America Invents Act creates competitive advantage in this fashion. However, typical approaches to improving the U.S. Patent Office will provide only limited competitive advantage in the United States because more foreign inventors utilize the U.S. patent system than U.S. inventors. Most of the benefits to improving the U.S. patent system would therefore be enjoyed by our competitors. Moreover, foreign inventors may be more responsive to improvements at the U.S. Patent Office than U.S. inventors.

U.S. patent law might nevertheless be able to create domestic competitive advantage by selectively improving the processing of patent

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301 PORTER, supra note 10, at 68 (“Nations succeed in industries where pressures are created that overcome inertia and promote ongoing improvement and innovation instead of an easy life. Nations fail in industries where firms stop the upgrading process.”).
applications for U.S. patents in technological areas in which U.S. businesses and inventors already enjoy competitive advantages. Such selective improvements could magnify those existing advantages. However, implementing selective improvements will not be easy. For example, it may be difficult to identify reliably which areas of technology to target for improvements. Moreover, foreign countries may retaliate by enacting similar measures, thereby disadvantaging U.S. interests in global markets.

Because the domestic competitive advantage created by traditional improvements to the U.S. Patent Office may be limited, policymakers should consider non-traditional approaches to U.S. patent law, such as the effect of U.S. patent law on U.S. culture. This aspect of U.S. patent law likely affects U.S. businesses and inventors more than their foreign rivals. In this way, changes to U.S. patent law and related statements by U.S. politicians can help to foster a culture in the United States that facilitates innovation. For instance, in signing the new America Invents Act and declaring innovation to be a national priority, President Obama may actually have helped to achieve that goal. Unfortunately, however, verifying and quantifying the effect of U.S. patent law on the values and beliefs of the U.S. populace – and thus on U.S. competitiveness – is exceedingly difficult if not impossible.

In short, the capacity of U.S. patent law to promote domestic competitive advantage often is limited. Protectionist U.S. patent law is likely futile. Traditional improvements to the U.S. Patent Office benefit both foreign and domestic innovators, so that U.S. businesses and inventors often gain little, if any, relative advantage over foreign rivals. The cultural impact of U.S. patent law is well suited to favoring U.S. interests, but the magnitude of such effects is unclear.

Given these limits, the United States should continue to explore non-traditional approaches to U.S. patent law that can create domestic competitive advantage. In addition, the United States should consider generating domestic competitive advantage through adjustments to other
areas of law that also affect innovation, including immigration, tax, education, and government expenditures. These areas of law are important topics for future research on innovation and competitive advantage. However, these areas of law face an important challenge that often is absent from patent law: Changes to the U.S. Patent Office do not require increases in federal spending because the U.S. Patent Office is

See INNOVATE AMERICA, supra note 9, at 11 (arguing that the United States must “[r]eform immigration to attract the best and brightest [science and engineering] students from around the world and provide work permits to foreign [science and engineering] graduates of U.S. institutions’’); GATHERING STORM, REVISITED, supra note 10, at 53-54. The Washington Post reports that “[i]mmigrants founded a quarter of all U.S. engineering at technology companies between 1995 and 2005.” Vivek Wadhwa, They’re Taking Their Brains and Going Home, WASHINGTON POST, Mar. 8, 2009. Despite this contribution, “the lumbering U.S. immigration bureaucracy helps push [immigrants] away” from the United States. Id.; see also AUGUSTINE, supra note 10, at 50 (“In fact, it can be responsibly argued that America’s scientific enterprise would virtually cease to function without the foreign-born talent that makes up such a crucial part of it.”).

AUGUSTINE, supra note 10, at 62 (“In the early 1990s, the United States ranked first among OECD nations offering tax incentives for R&D; but by 2004, it had fallen to 17th place.”); KAO, supra note 10, at 37 (discussing tax credits for research and development); INNOVATE AMERICA, supra note 9, at 11 (arguing that the United States must “[e]nact a permanent, restructured [research] tax credit”). Many states have enacted tax laws to promote innovation. See, e.g., State Enacts Job Incentive Program for Life Sciences in Redevelopment District, BIOTECH. WATCH (BNA) (Aug. 16, 2011) (discussing tax incentives for innovation in Rhode Island); State Enacts Credit for Life Sciences Businesses That Increase Tax Revenue, BIOTECH. WATCH (BNA) (Apr. 25, 2011) (Utah); Wisconsin Enacts Legislation Expanding, Creating Biofuel Production, Sales Incentives, BIOTECH. WATCH (BNA) (June 11, 2010) (Wisconsin).

See John C. Lechleiter, America’s Growing Innovation Gap, WALL STREET J., July 9, 2010; Fareed Zakaria, The Future of Innovation: Can America Keep Pace?, TIME, June 5, 2011 (arguing that “if we are to get the U.S. back to work, we need . . . to rebuild American education); John C. Lechleiter, America’s Growing Innovation Gap, WALL STREET J., July 9, 2010. Certain parts of the U.S. educational system appear to be ineffective. For example, in 2007, one-third of high school students in California failed to graduate. KAO, supra note 10, at 34; see also ČSIKSZENTMIHALYI, supra note 146, at 330 (“Clearly, the availability of training is crucial for developing any kind of talent.”).

INNOVATE AMERICA, supra note 9, at 11; Press Release, U.S. Patent and Trademark Office, USPTO Launches Small Business Innovation Research Pilot Program (Oct. 28, 2011), http://www.uspto.gov/news/prt2011/11-61.jsp (describing a pilot program by the U.S. Patent Office providing additional resources to certain innovative small businesses); see also 35 U.S.C. §§ 200-12 (describing the ownership of patents on inventions discovered using federal funding). According to one commentator, when adjusted for inflation “US federal support of research in the physical sciences, mathematics, and engineering . . . has been stagnant for 2 decades.” AUGUSTINE, supra note 10, at 58.
funded solely through “user fees,” including fees paid by patent applicants.\(^{306}\) In contrast, changes to tax, education, and government expenditures likely will require increased federal funding. In an era of deep cuts to the federal budget, political leaders are reluctant to increase any expenditures.\(^{307}\) On the other hand, because innovation is vital to the U.S. economy, avoiding these expenditures may be risky. As one innovation commentator has noted, “our competitors have not been standing still.”\(^{308}\) By the time the U.S. economy catches its breath, it may find that it has fallen behind in the global race for economic prosperity.

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308 AUGUSTINE, supra note 10, at 3, 10; see GATHERING STORM, REVISITED, supra note 10, at 4, 33.
### Appendix A

**Global Patent Applications, Patents, and Populations in Absolute Numbers and Per Capita by Inventor Country for 2009**

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<tbody>
<tr>
<td>Japan</td>
<td>128</td>
<td>423,316</td>
<td>224,795</td>
<td>3,318.56</td>
<td>1,762.27</td>
</tr>
<tr>
<td>Switzerland</td>
<td>8</td>
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