An Assessment of the Impact of the The *Inter Partes* Review Process under the Patent Trial and Appeal Board on the US Economy

January 2021

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Executive Summary

- Innovation has long been recognized as the key factor supporting US economic growth and competitiveness. A critical element of the infrastructure facilitating product development and commercialization is the system that protects intellectual property and encourages its widespread adoption and implementation. An important aspect of this framework is *inter partes* review (IPR), which can reduce costs.

- The Perryman Group's analysis indicates estimated **direct cost savings due to *inter partes* review** over the 2014-19 period include
    - **$1.676 billion** from instances where *inter partes* review resulted in a stay in litigation and
    - **$121.231 million** where an *inter partes* review was conducted in parallel with district court proceedings.

- Because these estimated direct savings represent a net gain in efficiency (reduction in cost with no corresponding loss of output), it is appropriate to consider the secondary (or "multiplier" effects) as these funds circulate through the economy.
    - In instances **where *inter partes* review resulted in a stay of litigation** (which constitutes a substantial majority of cases in which an IPR is initiated), The Perryman Group estimates that over the 2014-19 period, cost savings led to a net increase in US business activity of **$1.87 billion** in gross product, **$895.1 million** in personal income, and **8,530** job-years of employment (including multiplier effects).
    - In instances **where *inter partes* review was conducted parallel to district court litigation**, The Perryman Group estimates that over the 2014-19 period, cost savings led to a net increase in US business activity of **$135.4 million** in gross product, **$64.7 million** in personal income, and **617** job-years of employment (including multiplier effects).

- Economic performance in the United States over the long term is critically tied to the rate of innovation. The *inter partes* review process under AIA and PTAB enhances the efficiency of the innovation process, thus fostering future prosperity.

Introduction

Innovation has long been recognized as the key factor supporting US economic growth and competitiveness. A critical element of the infrastructure facilitating product development and commercialization is the system that protects intellectual property and encourages its widespread adoption and implementation. The current framework that facilitates this process includes the Leahy-Smith America Invents Act (AIA) and the Patent Trial and Appeal Board (PTAB). The AIA and PTAB reduce the need for and cost of patent litigation, reducing transaction costs and generating many substantial economic benefits.

An important aspect of the framework for protecting intellectual property is *inter partes* review, which reduces litigation costs and generates **substantial economic benefits**.

An important aspect of this framework is *inter partes* review (IPR).

The Perryman Group (TPG) was recently asked to estimate the effect of the *inter partes* review on US economic activity. This process involves first estimating the direct cost savings associated with reduced litigation costs related to the *inter partes* review process and then computing the total economic benefits of the associated efficiency gains as they ripple through the economy. This report presents results of TPG's analysis.

Inter Partes Review

The AIA was enacted into law on September 16, 2011. It was the culmination of a decade of Congressional consideration on how to improve patent quality and represented the most significant reforms to the US patent system in almost 60 years.

The AIA changed the way patent litigation is conducted, allowing for faster and less costly mechanisms. Trials under the AIA are overseen by the PTAB and are intended to be an alternative to district court litigation with several key differences. One difference is that AIA trials are conducted before a panel of three technically trained administrative patent judges, while district court cases

often involve a jury. Although discovery is available in both forums, discovery before the PTAB is more limited in scope which lowers the cost to litigate. Another key difference is that PTAB trials typically are resolved within 12 months from institution, whereas district court litigation may take several years to conclude.[1]

One important type of trial under the AIA is *inter partes* review. Under *inter partes* review, a member of the public can challenge the patentability of claims in an issued patent in a petition to the PTAB. For example, a petition may challenge an issued patent on grounds of anticipation or obviousness. These petitions often identify prior art patents and publications that might not have been considered by the original examiner.

> The AIA changed the way patent litigation is conducted, allowing for faster and less costly mechanisms.

Direct Cost Savings

In a prior study, The Perryman Group examined the total economic benefits of the PTAB process.[2] In the present analysis, attention is specifically focused solely on IPR, as opposed to other approaches such as Covered Business Methods (CBM), in cases where (1) the court proceedings are stayed during the review and (2) those in which the two approaches proceed simultaneously. The direct cost savings emanating from the *inter partes* review process established in the AIA stem from both reductions in legal fees incurred and the greater probability of a settlement or early-stage resolution.

Cost savings were derived through a multi-stage process involving compilation of a database of patent matters and their resolution by stage and size of risk over

[1] Gongola, Janet, "The Patent Trial and Appeal Board: Who are they and what do they do?," Patent Trial and Appeal Board, United States Patents and Trademark Office, Summer 2019, https://www.uspto.gov/learning-and-resources/newsletter/inventors-eye/patent-trial-and-appeal-board-who-are-they-and-what.

[2] "An Assessment of the Impact of the America Invents Act and the Patent Trial and Appeal Board on the US Economy," The Perryman Group, June 2020.

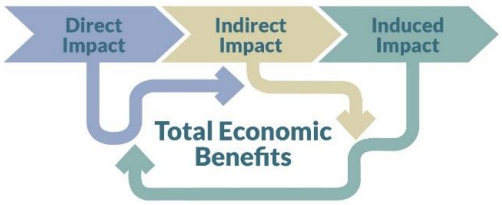
approximately 20 years, analysis of the numbers reaching discovery or trial phases, and estimation of costs with and without *inter partes* review under the AIA/PTAB. (See the Appendix for additional detail.)

The results of The Perryman Group's analysis indicate estimated **direct cost savings due to *inter partes* review over the 2014-19 period include $1.676 billion from instances where *inter partes* review resulted in a stay in litigation and $121.231 million where an *inter partes* review was conducted in parallel with district court proceedings**.

Economic Benefits

Because these estimated direct savings represent a net gain in efficiency (reduction in cost with no corresponding loss of output), it is appropriate to consider the secondary (or "multiplier" effects) as these funds circulate through the economy. To estimate overall benefits, the direct savings were allocated across industrial categories in a manner consistent with the volume of patent cases filed[3] and simulated using the Input-Output Model of the United States and related industrial data maintained by the Bureau of Economic Analysis of the US Department of Commerce (BEA).

Any economic stimulus, whether positive or negative, generates multiplier effects throughout the economy. In this case, the economic stimulus is gains in efficiency associated with cost reductions described in this summary. The public input-output model of the United States was then used to calculate total economic benefits.



The input-output process uses a variety of data (from surveys, industry information, and other sources) to describe the various goods and services (known as resources or inputs) required to produce another good/service. This

[3] "2018 Patent Litigation Study," PwC, May 2018, https://www.pwc.com/us/en/services/forensics/library/patent-litigation-study.html.

process allows for estimation of total economic impacts (including multiplier effects).

Total economic effects are quantified for key measures of business activity:

- Total expenditures (or total spending) measure the dollars changing hands as a result of the economic stimulus.

- Gross product (or output) is production of goods and services that will come about in each area as a result of the activity. This measure is parallel to the gross domestic product numbers commonly reported by various media outlets and is a subset of total expenditures.

- Personal income is dollars that end up in the hands of people in the area; the vast majority of this aggregate derives from the earnings of employees, but payments such as interest and rents are also included.

- Job gains are expressed as job-years of employment for cumulative measures. A job-year is one person working for one year, though it could be multiple persons working partial years.

Monetary values were quantified on a constant (2019) basis to eliminate the effects of inflation. Additional detail regarding the methods used is provided in the Appendix.

Instances Where Inter Partes Review Resulted in a Stay of Litigation

In instances where an *inter partes* review resulted in a stay of litigation (which constitutes a substantial majority of cases in which an IPR is initiated), The Perryman Group estimates that over the 2014-19 period, cost savings led to a **net increase in US business activity of $1.87 billion in gross product, $895.1 million in personal income, and 8,530 job-years of employment** (including multiplier effects).

The industry group experiencing the largest gains was manufacturing, with an estimated increase of **$893.8 million** in gross product and **3,231** job-years of employment (including multiplier effects).

All industry groups are positively affected, as described in the following table.

The Estimated Cumulative Impact (2014-19) of the Cost Savings Associated with *Inter Partes* Reviews Resulting in a Stay in District Court Litigation				
Industry	**Total Expenditures**	**Gross Product**	**Personal Income**	**Job-Years**
Agriculture	+$19.4 m	+$7.1 m	+$2.5 m	+55
Mining	+$75.7 m	+$43.1 m	+$10.5 m	+57
Utilities	+$73.4 m	+$50.0 m	+$13.1 m	+47
Construction	+$15.3 m	+$8.0 m	+$5.3 m	+52
Manufacturing	+$2,382.9 m	+$893.8 m	+$425.5 m	+3,231
Wholesale Trade	+$173.9 m	+$116.5 m	+$52.4 m	+431
Retail Trade	+$139.0 m	+$95.5 m	+$53.1 m	+727
Transportation & Warehousing	+$100.2 m	+$53.1 m	+$30.5 m	+344
Information	+$253.1 m	+$150.5 m	+$53.1 m	+442
Finance and Insurance	+$78.9 m	+$48.9 m	+$11.1 m	+203
Real Estate	+$170.7 m	+$105.9 m	+$24.0 m	+60
Professional Services	+$107.2 m	+$67.9 m	+$49.0 m	+385
Management Services	+$94.8 m	+$60.0 m	+$43.3 m	+316
Administrative Services	+$64.2 m	+$40.7 m	+$29.3 m	+500
Education Services	+$1.2 m	+$0.7 m	+$0.6 m	+9
Health and Social Services	+$29.8 m	+$18.5 m	+$14.9 m	+195
Amusement and Recreation Services	+$13.4 m	+$8.1 m	+$4.9 m	+66
Accommodation and Food Services	+$69.5 m	+$42.2 m	+$25.3 m	+640
Other Services	+$74.6 m	+$44.9 m	+$33.0 m	+590
Government	+$27.6 m	+$17.6 m	+$13.9 m	+180
Total, All Industries	**+$3,964.6 m**	**+$1,873.0 m**	**+$895.1 m**	**+8,530**

Source: The Perryman Group
Notes: Based on The Perryman Group's estimates of cost savings and the related multiplier effects through the economy. Monetary values given in millions of 2019 US dollars. A job-year is one person working for one year, though it could be multiple individuals working for partial years. Components may not sum to total due to rounding.

Instances Where Inter Partes Review Was Conducted Parallel to District Court Litigation

In instances where an *inter partes* review was conducted parallel to district court litigation, The Perryman Group estimates that over the 2014-19 period, cost savings led to a **net increase in US business activity of $135.4 million in gross product, $64.7 million in personal income, and 617 job-years of employment** (including multiplier effects).

The industry group experiencing the largest gains was manufacturing, with an estimated increase of **$64.6 million** in gross product and **234** job-years of employment (including multiplier effects).

All industry groups are positively affected, as described in the following table.

The Estimated Cumulative Impact (2014-19) of the Cost Savings Associated with *Inter Partes* Reviews Conducted Parallel to District Court Litigation				
Industry	**Total Expenditures**	**Gross Product**	**Personal Income**	**Job-Years**
Agriculture	+$1.4 m	+$0.5 m	+$0.2 m	+4
Mining	+$5.5 m	+$3.1 m	+$0.8 m	+4
Utilities	+$5.3 m	+$3.6 m	+$0.9 m	+3
Construction	+$1.1 m	+$0.6 m	+$0.4 m	+4
Manufacturing	+$172.3 m	+$64.6 m	+$30.8 m	+234
Wholesale Trade	+$12.6 m	+$8.4 m	+$3.8 m	+31
Retail Trade	+$10.1 m	+$6.9 m	+$3.8 m	+53
Transportation & Warehousing	+$7.2 m	+$3.8 m	+$2.2 m	+25
Information	+$18.3 m	+$10.9 m	+$3.8 m	+32
Finance and Insurance	+$5.7 m	+$3.5 m	+$0.8 m	+15
Real Estate	+$12.3 m	+$7.7 m	+$1.7 m	+4
Professional Services	+$7.8 m	+$4.9 m	+$3.5 m	+28
Management Services	+$6.9 m	+$4.3 m	+$3.1 m	+23
Administrative Services	+$4.6 m	+$2.9 m	+$2.1 m	+36
Education Services	+$0.1 m	+$0.1 m	+$0.0 m	+1
Health and Social Services	+$2.2 m	+$1.3 m	+$1.1 m	+14
Amusement and Recreation Services	+$1.0 m	+$0.6 m	+$0.4 m	+5
Accommodation and Food Services	+$5.0 m	+$3.1 m	+$1.8 m	+46
Other Services	+$5.4 m	+$3.2 m	+$2.4 m	+43
Government	+$2.0 m	+$1.3 m	+$1.0 m	+13
Total, All Industries	**+$286.7 m**	**+$135.4 m**	**+$64.7 m**	**+617**

Source: The Perryman Group
Notes: Based on The Perryman Group's estimates of cost savings and the related multiplier effects through the economy. Monetary values given in millions of 2019 US dollars. A job-year is one person working for one year, though it could be multiple individuals working for partial years. Components may not sum to total due to rounding.

Conclusion

The *inter partes* review process under the AIA/PTAB leads to substantial cost savings in patent litigation. These savings and the related increase in efficiency generate economic benefits across the economy. The Perryman Group estimates that over the 2014-19 period, the total economic benefits of *inter partes* reviews resulting in stay of litigation in district court included an increase in US business activity of **$1.87 billion** in gross product and **8,530** job-years of employment when multiplier effects are considered. In situations where an *inter partes* review was conducted parallel to a district court proceeding, the economic benefits of cost savings over the 2014-19 period include estimated increases of **$135.4 million** in US gross product and **617** person-years of employment (including multiplier effects). These benefits are concentrated in the manufacturing sector.

> Cost savings associated with the *inter partes* review process under AIA/PTAB lead to significant increases in US business activity.

Economic performance in the United States over the long term is critically tied to the rate of innovation. The *inter partes* review process under AIA and PTAB enhances the efficiency of the innovation process, thus fostering future prosperity.

Appendix: Methods Used

The basic modeling technique employed in this study is known as dynamic input-output analysis, which essentially uses extensive survey data, industry information, and a variety of corroborative source materials to create a matrix describing the various goods and services (known as resources or inputs) required to produce one unit (a dollar's worth) of output for a given sector. Once the base information is compiled, it can be mathematically simulated to generate evaluations of the magnitude of successive rounds of activity involved in the overall production process.

There are two essential steps in conducting an input-output analysis once the system is operational. The first major endeavor is to accurately define the levels of direct activity to be evaluated. Second, the resulting inputs are used in a simulation of an input-output system, in this case the Input-Output Model of the United States maintained by the US Department of Commerce.

Estimation of Direct Savings

The determination of the cost savings for various types of litigation and the number of cases in each representative category involved a multi-stage process. Using data from the widely respected biennial self-reported litigation cost surveys conducted by the American Intellectual Property Law Association (AILPA),[4] it was possible to develop a database of estimated patent litigation costs by amount at risk and stage at which the case was resolved dating back to 2001. A comparable series was developed for trademark litigation in order to establish a benchmark for trends in other types of intellectual property matters. The patterns in trademark cases were used to estimate the cost of patent matters by risk and size category in the absence of AIA/PTAB. These patterns were compared with overall civil litigation cost estimates and found to be reasonable.

In order to determine aggregate cost savings, it was necessary to determine the number of cases that proceed to the later stages of discovery or trial. The analysis was limited to only matters with more than $1 million at risk. This assumption may result in a modest understatement of the overall direct benefits. It is likely to be negligible, however, in that (1) the overwhelming majority of smaller matters are resolved early in the process due to cost considerations and (2) the expense of a PTAB proceeding

[4] "Report of the Economic Survey (various years 2001-2019)," American Intellectual Property Law Association (AIPLA), www.aipla.org.

and other expense relative to the amounts at risk make it unlikely to be a cost-effective investment in many instances.

Although only about 10% of cases reach the late discovery and/or trial phases, the vast majority of these have substantial amounts at risk. Data from the major courts where patent cases are tried provide a valid mechanism to estimate the proportion that progress to the major stages of discovery and trial are associated with higher amounts at risk[5]. Moreover, data related to damage awards in major jurisdictions and by industry provide a basis to estimate a distribution of cases according to categories of risk.[6] Combining the results of these analysis segments with information regarding (1) the percentage of *inter partes* reviews which are conducted with and without the litigation being stayed, (2) the number of cases resolved through the IPR process, (3) settlement patterns in the relevant matters, and (4) costs incurred at each stage of the process permits computation of estimated direct savings over the 2014-2019 period. Finally, all values are converted to constant 2019 dollars using the Implicit Price Deflator for Professional Services obtained from the Bureau of Economic Analysis of the US Department of Commerce (BEA). This procedure is necessary to eliminate any inflationary effects and allow the savings to be aggregated on a consistent basis.

The end result of this analysis is an estimated **direct savings over the 2014-19 period of $1.677 billion** in cases where *inter partes* review resulted in a stay in litigation and **$121.231 million** in cases where the review was conducted parallel to a district court case. Once these direct effects were estimated, total economic impacts where quantified through model simulation as described below.

Model Simulation

Simulations of the Input-Output Model of the United States maintained by the US Department of Commerce were utilized to measure overall economic effects of the direct cost savings estimated during the course of this analysis and described above.

The impact assessment (input-output) process essentially estimates the amounts of all types of goods and services required to produce one unit (a dollar's worth) of a specific type of output. For purposes of illustrating the nature of the system, it is useful to think of inputs and outputs in dollar (rather than physical) terms. As an example, the construction of a new building will require specific dollar amounts of lumber, glass, concrete, hand tools, architectural services, interior design services, paint, plumbing,

[5] Yoon, James C., "IP Litigation in United States," Wilson Sonsini Goodrich & Rosati, August 2016, https://law.stanford.edu/wp-content/uploads/2016/07/Revised-Stanford-August-4-2016-Class-Presentation.pdf.
[6] "2018 Patent Litigation Study," PwC, May 2018, https://www.pwc.com/us/en/services/forensics/library/patent-litigation-study.html.

and numerous other elements. Each of these suppliers must, in turn, purchase additional dollar amounts of inputs. This process continues through multiple rounds of production, thus generating subsequent increments to business activity. The initial process of building the facility is known as the *direct effect*. The ensuing transactions in the output chain constitute the *indirect effect.*

Another pattern that arises in response to any direct economic activity comes from the payroll dollars received by employees at each stage of the production cycle. As workers are compensated, they use some of their income for taxes, savings, and purchases from external markets. A substantial portion, however, is spent locally on food, clothing, health care services, utilities, housing, recreation, and other items.

Impacts were measured in constant 2019 dollars to eliminate the effects of inflation.

Definitions of Terms

The input-output process generates estimates of the effect on several measures of business activity. The most comprehensive measure of economic activity used in this study is **Total Expenditures**. This measure incorporates every dollar that changes hands in any transaction. For example, suppose a farmer sells wheat to a miller for $0.50; the miller then sells flour to a baker for $0.75; the baker, in turn, sells bread to a customer for $1.25. The Total Expenditures recorded in this instance would be $2.50, that is, $0.50 + $0.75 + $1.25. This measure is quite broad but is useful in that (1) it reflects the overall interplay of all industries in the economy, and (2) some key fiscal variables such as sales taxes are linked to aggregate spending.

A second measure of business activity frequently employed in this analysis is that of **Gross Product**. This indicator represents the regional equivalent of Gross Domestic Product, the most commonly reported statistic regarding national economic performance. In other words, the Gross Product of Texas is the amount of US output that is produced in that state; it is defined as the value of all final goods produced in a given region for a specific period of time. Stated differently, it captures the amount of value-added (gross area product) over intermediate goods and services at each stage of the production process, that is, it eliminates the double counting in the Total Expenditures concept. Using the example above, the Gross Product is $1.25 (the value of the bread) rather than $2.50. Alternatively, it may be viewed as the sum of the value-added by the farmer, $0.50; the miller, $0.25 ($0.75 - $0.50); and the baker, $0.50 ($1.25 - $0.75). The total value-added is, therefore, $1.25, which is equivalent to the final value of the bread. In many industries, the primary component of value-added is the wage and salary payments to employees.

The third gauge of economic activity used in this evaluation is **Personal Income**. As the name implies, Personal Income is simply the income received by individuals, whether in the form of wages, salaries, interest, dividends, proprietors' profits, or other sources. It may thus be viewed as the segment of overall impacts which flows directly to the citizenry.

The final aggregates used are **Jobs and Job-Years,** which reflect the full-time equivalent jobs generated by an activity. For an economic stimulus expected to endure (such as the ongoing operations of a facility), the Jobs measure is used. It should be noted that, unlike the dollar values described above, Jobs is a "stock" rather than a "flow." In other words, if an area produces $1 million in output in 2018 and $1 million in 2019, it is appropriate to say that $2 million was achieved in the 2018-19 period. If the same area has 100 people working in 2018 and 100 in 2019, it only has 100 Jobs. When a flow of jobs is measured, such as in a construction project or a cumulative assessment over multiple years, it is appropriate to measure employment in Job-Years (a person working for a year, though it could be multiple people working for partial years). This concept is distinct from permanent Jobs, which anticipates that the relevant positions will be maintained on a continuing basis.

About The Perryman Group

The Perryman Group has served the needs of more than 2,500 private-sector clients in numerous industries including

- the 9 largest firms in the US,
- 8 of the 10 largest law firms in the US,
- 3 of the 4 largest domestic foundations,
- the 6 largest energy companies doing business in the US,
- the 12 largest technology companies in the world,
- the 5 largest financial institutions in the US,
- two-thirds of the Global 25, and
- more than one-half of the Fortune 100.

The firm has also completed over 1,000 public policy studies on a variety of issues, and Dr. Perryman has served as advisor and/or consultant to several Presidents, numerous House and Senate Committees, 10 Cabinet departments, numerous foreign governments, and more than 100 other state and federal agencies. He has testified extensively regarding economic, financial, statistical, and damages issues in state and federal courts as well as in more than 100 regulatory proceedings.