

**An Assessment of the Potential Impact of  
Expanding *Inter Partes* Review (IPR) Under the  
America Invents Act on the US Economy**

September 2021



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# Executive Summary

## BACKGROUND

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 patent litigation, reducing costs and generating substantial economic benefits. Potential expansions of the AIA would lead to additional gains in business activity.

## Potential AIA Expansion Scenarios

**Scenario One:**  
All court proceedings automatically stayed while the IPR process is ongoing.

In a prior study, The Perryman Group estimated that the direct cost savings from the AIA/PTAB over the 2014-19 period was **\$2.644 billion or about \$262,200 for each of the 10,085 proceedings and could have been \$310,400 per case** if all Court proceedings had been stayed.

**Scenario Two:**  
All invalidity defenses can be asserted in IPR proceedings.

**\$262,200**  
**PER CASE**  
average savings over the 2014-19 period under the current structure

**Scenario Three:**  
Expansions of the AIA in both Scenarios One and Two are implemented.

**\$310,400**  
**PER CASE**  
potential average savings over the 2014-19 period with expansion

The Perryman Group estimates that over the 2014-19 period, cost savings associated with the AIA/PTAB with the additional provisions in place could have generated an incremental increase in US business activity (including multiplier effects):

**+\$1.49**  
**BILLION**  
in gross product

**+\$712.7**  
**MILLION**  
in personal income

**+6,792**  
job-years  
of employment

## TAKEAWAY

Economic performance in the United States over the long term is tied to innovation. The AIA and PTAB not only support innovation, but also generate substantial economic benefits. These benefits could be even greater with expansion of the AIA.

## 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

**The AIA and PTAB reduce the need for patent litigation, reducing costs and generating substantial economic benefits.**

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 substantial economic benefits. Potential expansion of the AIA to further enhance its applicability could lead to notable additional gains.

The Perryman Group (TPG) has previously analyzed this system and quantified its current impact<sup>1</sup> and was recently asked to estimate the effect of expanding the role of PTAB on US economic activity. For purposes of consistency and comparability, this investigation is conducted over the same time horizon as its predecessor. This process initially involves estimating the direct cost savings associated with potential policy options 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 extended analysis.

## PTAB and AIA Background

The Leahy-Smith America Invents Act (AIA) was enacted into law on September 16, 2011. It was the culmination of a decade of Congressional consideration of mechanisms to improve patent quality and represented the most significant reforms to the US patent system in almost 60 years.

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<sup>1</sup> "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.

Among other significant improvements, the AIA changed the way patent litigation is conducted, allowing for a faster and less costly process. Trials under the AIA are overseen by the PTAB, which is an adjudicative body within the US Patent and Trademark Office (USPTO), and are intended to serve as an alternative to district court litigation with several key differences. One modification is that AIA trials, known as *Inter Partes* reviews (IPRs) 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, it is more limited in scope before the PTAB, which reduces 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.<sup>2</sup>

The PTAB decides appeals from the decisions of patent examiners and adjudicates the patentability of issued patents challenged by third parties in post-grant proceedings. If an applicant for a patent receives a second or final rejection from an examiner, the applicant may seek review of the rejection by the PTAB. The PTAB

Over the 2014-19 period, the PTAB oversaw about **10,085 cases** under the AIA. These matters typically involved technology-oriented patents in high value-added industries.

decides about 12,000 appeals and 1,500 trial proceedings per year, though it varies over time.<sup>3</sup>

Over the 2014-19 period, the PTAB

oversaw roughly 10,085 petitions filed with the AIA. These matters typically involved technology-oriented patents in high value-added industries. On average, about one-third of those petitions mature into full proceedings, while roughly one-third are resolved through settlement, and the remaining one-third are denied institution.<sup>4</sup>

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<sup>2</sup> Gongola, Janet, “The Patent Trial and Appeal Board: Who are they and what do they do?,” Patent Trial and Appeal Board, United States Patent 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>.

<sup>3</sup> *Id.* The USPTO keeps statistics, updated monthly, at <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/statistics>.

<sup>4</sup> See United States Patent and Trademark Office, Statistics, (n.d.), <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/statistics>.

## Potential Expansions of the AIA

While the AIA and PTAB have resulted in substantial direct savings and, hence economic benefits, these benefits could increase if PTAB's role expanded. The Perryman Group developed three potential scenarios reflective of possible expansions.

- In Scenario One, all court proceedings would be automatically stayed while the IPR process is ongoing. Currently, such stays are at the discretion of the judge.
- In Scenario Two, all invalidity defenses can be asserted in IPR proceedings. Currently, a number of such defenses are not accepted.
- Scenario Three assumes that the expansions in both Scenario One and Scenario Two are implemented. The benefits associated with Scenario Three are greater than the sum of the two, because the additional proceedings allowed if all invalidity defenses can be asserted would also benefit if all proceedings are stayed while the IPR process is ongoing.

## Direct Cost Savings

The direct cost savings emanating from the PTAB process established in the AIA stem from both

- reductions in the number of patent lawsuits filed in district courts and
- reductions in adjudication cost per case.

The Perryman Group estimated the effect of AIA/PTAB on the numbers of cases filed based on historical patterns and trends in other types of litigation. In addition, the cost

**Direct cost savings over the 2014-19 period are estimated to be about \$262,200 per case under the current AIA structure, and could have been \$310,400 with potential expansions.**

of patent litigation was evaluated based on changes over time relative to other relevant types of litigation during a similar period. Cost savings were then

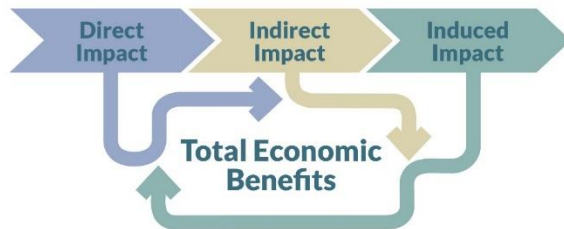
derived through a multi-stage process involving compilation of a database of patent matters and their resolution by stage and size of risk over approximately 20 years, analysis of the numbers reaching discovery or trial phases, and estimation of costs with and without AIA/PTAB. (See the Appendix for additional detail.)

The results of The Perryman Group's analysis indicate estimated **direct cost savings over the 2014-19 period of \$2.644 billion, or about \$262,200 per case under the current AIA structure. Under Scenarios One and Three, benefits per case could potentially rise to \$310,400.** (Scenario Two would continue to have the dual proceedings in some cases.)

## Total 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<sup>5</sup> and simulated using the Input-Output Model of the United States and related industrial data maintained by 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 maintained by the Bureau of Economic Analysis of the US Department of Commerce (BEA) 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

<sup>5</sup> "2018 Patent Litigation Study," PwC, May 2018, <https://www.pwc.com/us/en/services/forensics/library/patent-litigation-study.html>.

inputs) required to produce another good/service. This 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.

Over the 2014-19 period, cost savings associated with AIA/PTAB led to an increase in US business activity of an estimated

- ✓ **\$2.95 billion** in gross product,
- ✓ **\$1.41 billion** in personal income, and
- ✓ **nearly 13,500 job-years** of employment (including multiplier effects).

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.

### *Current Structure*

In the prior study, The Perryman Group estimated that over the 2014-19 period, cost savings associated with AIA/PTAB led to an **increase in US business activity of \$2.95 billion in gross product, \$1.41 billion in personal income, and nearly 13,500 job-years of employment** (including multiplier effects). With about 10,085 AIA/PTAB trials over the 2014-19 period, the estimated economic benefit averaged over **\$292,900 per case** in US gross product and **\$139,985** in personal income.



The industry group experiencing the largest gains was manufacturing, with an estimated increase of **\$1.41 billion** in gross product and almost **5,100** job-years of employment (including multiplier effects).

### *Potential Expansion of the AIA*

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The two scenarios reflecting potential expansions of the AIA would enhance efficiency, reduce costs, and increase economic benefits. The Perryman Group measured effects over the same 2014-19 period assuming that these provisions of the AIA had been in place.

If all court proceedings would be automatically stayed while the IPR process is ongoing, The Perryman Group estimates that over the 2014-19 period, incremental cost savings would have led to an **increase in US business activity of \$543.1 million in gross product, \$259.6 million in personal income, and 2,474 job-years** of employment (including multiplier effects).

If all invalidity defenses could be asserted in IPR proceedings, incremental savings and the resulting increase in business activity include an estimated **\$731.3 million in gross product, \$349.5 million in personal income, and 3,331 job-years** of employment (including multiplier effects) in the US over the 2014-19 period.

If both expansions of the AIA had been in place, The Perryman Group estimates that the total additional economic benefits over the 2014-19 period would include **\$1,491.3 million in gross product, \$712.7 million in personal income, and 6,792 job-years** of employment (including multiplier effects) in the US. (As noted, the benefits associated with Scenario Three are greater than the sum of the prior two if implemented separately, as the additional proceedings allowed if all invalidity defenses could be asserted would also benefit from being universally stayed while the IPR process is ongoing.)

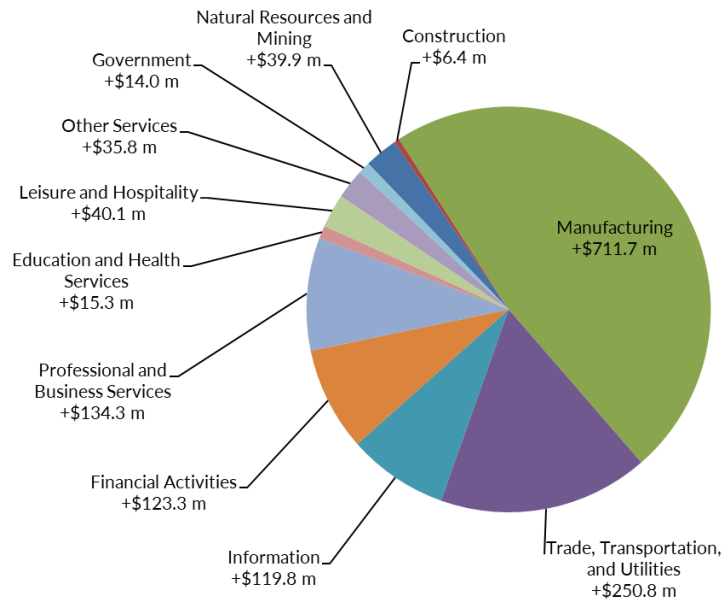
The industry group experiencing the largest additional gains would have been manufacturing, with an estimated increase of **\$711.7 million** in gross product and **2,573** job-years of employment (including multiplier effects) under a scenario including both expansions.

## The Estimated Cumulative Impact (2014-19) on US Business Activity of the Cost Savings Associated with the Leahy-Smith America Invents Act (AIA) and the Patent Trial and Appeal Board (PTAB) Under the Current Structure and with Potential Expansions in Place

Industry	Total Expenditures	Gross Product	Personal Income	Job-Years
<b>Current Structure</b>	<b>+\$6,252.9 m</b>	<b>+\$2,954.0 m</b>	<b>+\$1,411.7 m</b>	<b>+13,454</b>
<b>Scenario One:</b> Court Proceedings Automatically Stayed During IPR Process	<b>+\$1,149.640 m</b>	<b>+\$543.111 m</b>	<b>+\$259.559 m</b>	<b>+2,474</b>
<b>Scenario Two:</b> All Invalidity Defenses Allowed	<b>+\$1,548.089 m</b>	<b>+\$731.345 m</b>	<b>+\$349.518 m</b>	<b>+3,331</b>
<b>Scenario Three:</b> Both Potential Expansions (Scenarios 1 and 2) in Place	<b>+\$3,156.804 m</b>	<b>+\$1,491.331 m</b>	<b>+\$712.723 m</b>	<b>+6,792</b>
Source: The Perryman Group				
Notes: Based on The Perryman Groups estimates of cost savings associated with AIA/PTAB under the current structure and with potential expansions and the related multiplier effects through the economy. The benefits associated with Scenario Three are greater than the sum of the two, because the additional proceedings allowed if all invalidity defenses can be asserted would also benefit if all proceedings are stayed while the IPR process is ongoing. 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.				

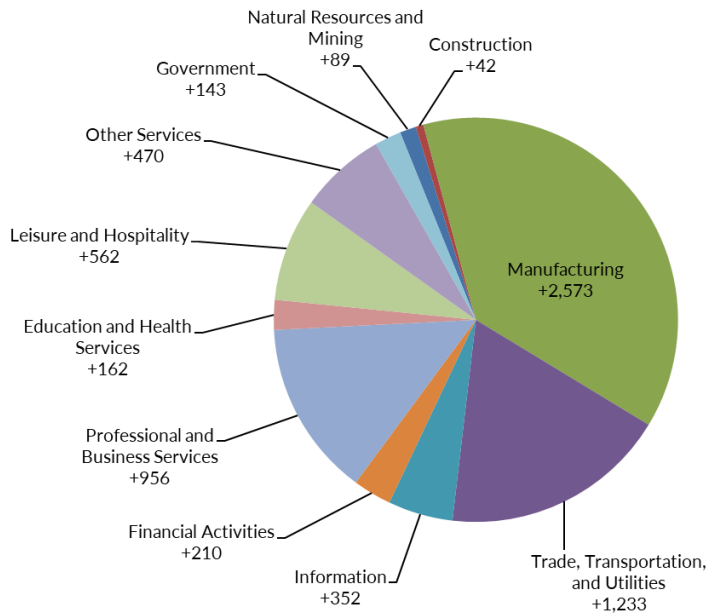
All industry groups are positively affected, as described in the following graphics and the tables in Appendix A.

**Estimated Cumulative Impact (2014-2019) of Incremental Cost Savings Associated with the AIA if Court Proceedings are Automatically Stayed and All Invalidation Defenses May Be Asserted in the IPR Process on US Gross Product by Industry**



Source: The Perryman Group

**Estimated Cumulative Impact (2014-2019) of Incremental Cost Savings Associated with the AIA if Court Proceedings are Automatically Stayed and All Invalidation Defenses May Be Asserted in the IPR Process on US Employment by Industry**



Source: The Perryman Group

## Conclusion

The Leahy-Smith America Invents Act and the Patent Trial and Appeal Board lead 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 AIA/PTAB

If the AIA had included provisions that all court proceedings were automatically stayed during IPR proceedings and all invalidity defenses were allowed, incremental benefits would include an estimated \$1.49 billion in gross product and nearly 6,800 job-years of employment over the 2014-19 period (including multiplier effects).

included an increase in US business activity of **\$2.95 billion** in gross product and nearly **13,500** job-years of employment when multiplier effects are considered. If the AIA had included provisions that all court proceedings were automatically stayed during IPR proceedings and all invalidity defenses

were allowed, incremental benefits would include an estimated **\$1.49 billion** in gross product and nearly **6,800** job-years of employment over the 2014-19 period (including multiplier effects). Under all scenarios, benefits are concentrated in the manufacturing sector.

Economic performance in the United States over the long term is critically tied to the rate of innovation. The AIA and PTAB enhance the efficiency of the innovation process, thus fostering future prosperity. Furthermore, expanding the role of PTAB could lead to additional cost savings and, hence, economic benefits.

# Appendix A: Results by Industry

## The Estimated Cumulative Impact (2014-19) of the Cost Savings Associated with the Leahy-Smith America Invents Act (AIA) and the Patent Trial and Appeal Board (PTAB) on US Business Activity

Industry	Total Expenditures	Gross Product	Personal Income	Job-Years
<b>Agriculture</b>	+\$30.7 m	+\$11.1 m	+\$4.0 m	+86
<b>Mining</b>	+\$119.4 m	+\$67.9 m	+\$16.5 m	+90
<b>Utilities</b>	+\$115.7 m	+\$78.8 m	+\$20.6 m	+75
<b>Construction</b>	+\$24.2 m	+\$12.6 m	+\$8.3 m	+83
<b>Manufacturing</b>	+\$3,758.3 m	+\$1,409.7 m	+\$671.1 m	+5,096
<b>Wholesale Trade</b>	+\$274.2 m	+\$183.7 m	+\$82.6 m	+680
<b>Retail Trade</b>	+\$219.2 m	+\$150.5 m	+\$83.8 m	+1,147
<b>Transportation &amp; Warehousing</b>	+\$158.0 m	+\$83.7 m	+\$48.0 m	+542
<b>Information</b>	+\$399.2 m	+\$237.4 m	+\$83.8 m	+698
<b>Finance and Insurance</b>	+\$124.4 m	+\$77.2 m	+\$17.5 m	+320
<b>Real Estate</b>	+\$269.2 m	+\$167.0 m	+\$37.9 m	+95
<b>Professional Services</b>	+\$169.1 m	+\$107.1 m	+\$77.2 m	+608
<b>Management Services</b>	+\$149.5 m	+\$94.7 m	+\$68.3 m	+499
<b>Administrative Services</b>	+\$101.3 m	+\$64.2 m	+\$46.3 m	+788
<b>Education Services</b>	+\$1.8 m	+\$1.1 m	+\$0.9 m	+14
<b>Health and Social Services</b>	+\$46.9 m	+\$29.2 m	+\$23.5 m	+307
<b>Amusement and Recreation Services</b>	+\$21.1 m	+\$12.8 m	+\$7.7 m	+104
<b>Accommodation and Food Services</b>	+\$109.6 m	+\$66.6 m	+\$39.8 m	+1,009
<b>Other Services</b>	+\$117.6 m	+\$70.8 m	+\$52.0 m	+931
<b>Government</b>	+\$43.5 m	+\$27.8 m	+\$22.0 m	+284
<b>Total, All Industries</b>	<b>+\$6,252.9 m</b>	<b>+\$2,954.0 m</b>	<b>+\$1,411.7 m</b>	<b>+13,454</b>

Source: The Perryman Group

Notes: Based on The Perryman Group's estimates of cost savings associated with AIA/PTAB 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.

**The Estimated Potential Incremental Cumulative Impact (2014-19) on US Business Activity Associated with the Leahy-Smith America Invents Act (AIA) Under the Assumption that the Initiation of an *Inter Partes* Review (IPR) Proceeding Automatically Stayed Court Proceedings**

<b>Industry</b>	<b>Total Expenditures</b> (Millions of 2019\$)	<b>Gross Product</b> (Millions of 2019\$)	<b>Personal Income</b> (Millions of 2019\$)	<b>Job-Years</b>
<b>Agriculture</b>	\$5.640	\$2.049	\$0.732	16
<b>Mining</b>	\$21.946	\$12.484	\$3.033	17
<b>Utilities</b>	\$21.274	\$14.494	\$3.792	14
<b>Construction</b>	\$4.445	\$2.321	\$1.532	15
<b>Manufacturing</b>	\$690.979	\$259.180	\$123.381	937
<b>Wholesale Trade</b>	\$50.417	\$33.781	\$15.184	125
<b>Retail Trade</b>	\$40.308	\$27.679	\$15.409	211
<b>Transportation and Warehousing</b>	\$29.056	\$15.390	\$8.830	100
<b>Information</b>	\$73.393	\$43.642	\$15.404	128
<b>Finance and Insurance</b>	\$22.880	\$14.194	\$3.218	59
<b>Real Estate</b>	\$49.493	\$30.703	\$6.962	17
<b>Professional Services</b>	\$31.084	\$19.693	\$14.201	112
<b>Management Services</b>	\$27.483	\$17.411	\$12.556	92
<b>Administrative Services</b>	\$18.623	\$11.798	\$8.508	145
<b>Education Services</b>	\$0.335	\$0.208	\$0.167	3
<b>Health and Social Services</b>	\$8.631	\$5.364	\$4.318	56
<b>Amusement and Recreation Services</b>	\$3.874	\$2.353	\$1.409	19
<b>Accommodation and Food Services</b>	\$20.150	\$12.238	\$7.326	186
<b>Other Services</b>	\$21.626	\$13.021	\$9.557	171
<b>Government</b>	\$8.005	\$5.106	\$4.038	52
<b>Total, All Industries</b>	<b>\$1,149.640</b>	<b>\$543.111</b>	<b>\$259.559</b>	<b>2,474</b>

Source: The Perryman Group

Notes: This scenario illustrates the enhanced benefits that would have occurred over the 2014-2019 period if the AIA had included provisions which automatically stayed court proceedings until the IPR process was completed. A detailed description of the methodology used to implement this analysis is found in Appendix B of this report. 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.

**The Estimated Potential Incremental Cumulative Impact (2014-19) on US Business Activity Associated with the Leahy-Smith America Invents Act (AIA) Under the Assumption that All Invalidation Defenses Could be Asserted During an *Inter Partes* Review (IPR) Proceeding**

<b>Industry</b>	<b>Total Expenditures</b> (Millions of 2019\$)	<b>Gross Product</b> (Millions of 2019\$)	<b>Personal Income</b> (Millions of 2019\$)	<b>Job-Years</b>
<b>Agriculture</b>	\$7.594	\$2.760	\$0.986	21
<b>Mining</b>	\$29.552	\$16.810	\$4.084	22
<b>Utilities</b>	\$28.647	\$19.518	\$5.106	19
<b>Construction</b>	\$5.985	\$3.126	\$2.063	20
<b>Manufacturing</b>	\$930.463	\$349.008	\$166.142	1,262
<b>Wholesale Trade</b>	\$67.890	\$45.490	\$20.446	168
<b>Retail Trade</b>	\$54.278	\$37.272	\$20.750	284
<b>Transportation and Warehousing</b>	\$39.126	\$20.724	\$11.891	134
<b>Information</b>	\$98.830	\$58.768	\$20.743	173
<b>Finance and Insurance</b>	\$30.810	\$19.113	\$4.334	79
<b>Real Estate</b>	\$66.646	\$41.345	\$9.374	23
<b>Professional Services</b>	\$41.857	\$26.518	\$19.123	150
<b>Management Services</b>	\$37.008	\$23.446	\$16.908	124
<b>Administrative Services</b>	\$25.078	\$15.887	\$11.457	195
<b>Education Services</b>	\$0.451	\$0.280	\$0.226	3
<b>Health and Social Services</b>	\$11.622	\$7.223	\$5.815	76
<b>Amusement and Recreation Services</b>	\$5.217	\$3.168	\$1.897	26
<b>Accommodation and Food Services</b>	\$27.134	\$16.479	\$9.866	250
<b>Other Services</b>	\$29.121	\$17.534	\$12.869	230
<b>Government</b>	\$10.779	\$6.876	\$5.437	70
<b>Total, All Industries</b>	<b>\$1,548.089</b>	<b>\$731.345</b>	<b>\$349.518</b>	<b>3,331</b>

Source: The Perryman Group

Notes: This scenario illustrates the enhanced benefits that would have occurred over the 2014-2019 period if the AIA had included provisions allowing all invalidity defenses to be asserted within the IPR process. A detailed description of the methodology used to implement this analysis is found in Appendix B of this report. 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.



**The Estimated Potential Incremental Cumulative Impact (2014-19) on US Business Activity Associated with the Leahy-Smith America Invents Act (AIA) Assuming Court Proceedings are Automatically Stayed and All Invalidation Defenses May be Asserted During an *Inter Partes* Review (IPR) Proceeding**

<b>Industry</b>	<b>Total Expenditures</b> (Millions of 2019\$)	<b>Gross Product</b> (Millions of 2019\$)	<b>Personal Income</b> (Millions of 2019\$)	<b>Job-Years</b>
<b>Agriculture</b>	\$15.486	\$5.627	\$2.010	44
<b>Mining</b>	\$60.261	\$34.279	\$8.329	45
<b>Utilities</b>	\$58.415	\$39.799	\$10.412	38
<b>Construction</b>	\$12.204	\$6.375	\$4.207	42
<b>Manufacturing</b>	\$1,897.364	\$711.684	\$338.791	2,573
<b>Wholesale Trade</b>	\$138.439	\$92.761	\$41.692	343
<b>Retail Trade</b>	\$110.683	\$76.004	\$42.313	579
<b>Transportation and Warehousing</b>	\$79.785	\$42.259	\$24.247	274
<b>Information</b>	\$201.531	\$119.838	\$42.298	352
<b>Finance and Insurance</b>	\$62.826	\$38.975	\$8.837	162
<b>Real Estate</b>	\$135.902	\$84.308	\$19.116	48
<b>Professional Services</b>	\$85.354	\$54.074	\$38.996	307
<b>Management Services</b>	\$75.465	\$47.810	\$34.478	252
<b>Administrative Services</b>	\$51.137	\$32.397	\$23.363	398
<b>Education Services</b>	\$0.919	\$0.571	\$0.460	7
<b>Health and Social Services</b>	\$23.699	\$14.728	\$11.858	155
<b>Amusement and Recreation Services</b>	\$10.638	\$6.461	\$3.868	52
<b>Accommodation and Food Services</b>	\$55.330	\$33.603	\$20.118	509
<b>Other Services</b>	\$59.383	\$35.756	\$26.242	470
<b>Government</b>	\$21.981	\$14.022	\$11.088	143
<b>Total, All Industries</b>	<b>\$3,156.804</b>	<b>\$1,491.331</b>	<b>\$712.723</b>	<b>6,792</b>

Source: The Perryman Group

Notes: This scenario illustrates the enhanced benefits that would have occurred over the 2014-2019 period if the AIA had included provisions (1) automatically staying court proceedings until the IPR process was completed and (2) allowing all invalidity defenses to be asserted within the IPR process. A detailed description of the methodology used to implement this analysis is found in Appendix B of this report. 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.

## Appendix B: 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*

In a prior study, TPG examined the overall cost savings and resulting economic benefits associated with the implementation of the AIA and the IPR process associated with the Patent Trial and Appeal Board.<sup>6</sup> In order to assess the patterns in cases filed within that analysis, TPG initially examined historical data on the number of cases initiated. The evidence revealed a substantial drop in matters over time. To isolate the effects of AIA/PTAB, the historical correlation between patent and trademark filings<sup>7</sup> was used to project the future path of patent case initiations over the 2014-19 period in the absence of the new framework. As noted below, other intervening factors were also considered in the analysis. The calculated increment was converted to a constant rate of growth over the period based on the trend in the projections. The values were also compared to patterns in total federal civil litigation filings<sup>8</sup> and estimates of overall civil litigation costs<sup>9</sup> and found to be generally consistent.

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<sup>6</sup> "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.

<sup>7</sup> "Just the Facts: Intellectual Property Cases-Patent, Copyright, and Trademark," Figure 1, United States Courts, February 13, 2020, <https://www.uscourts.gov/news/2020/02/13/just-facts-intellectual-property-cases-patent-copyright-and-trademark>.

<sup>8</sup> "Federal Judicial Caseload Statistics 2019," United States Courts, 2019, <https://www.uscourts.gov/statistics-reports/federal-judicial-caseload-statistics-2019>.

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 American Intellectual Property Law Association (AILPA).<sup>10</sup> 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. As with the number of cases, 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 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<sup>11</sup>. 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.<sup>12</sup> The combination of these analysis segments then permits computation of estimated costs over the 2014-19 period both with and without the presence of AIA/PTAB, with the difference being the direct savings associated with the patent review process.

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<sup>9</sup> See for example, “Economic Benefits of Tort Reform, An assessment of excessive tort costs in California and potential economic benefits of reform,” The Perryman Group, November 2019, <https://californiacala.org/reports-1/economic-benefits-of-tort-reform>.

<sup>10</sup> “Report of the Economic Survey (various years 2001-2019),” American Intellectual Property Law Association (AIPLA), [www.aipla.org](http://www.aipla.org).

<sup>11</sup> 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>.

<sup>12</sup> “2018 Patent Litigation Study,” PwC, May 2018, <https://www.pwc.com/us/en/services/forensics/library/patent-litigation-study.html>.

Three final adjustments to these estimates were also implemented. First, the typical cost of a PTAB proceeding was deducted for each matter in order to determine a net savings amount. This segment of the analysis may result in a modest understatement of the actual direct benefits in that some matters would not involve a patent review.<sup>13</sup> Second, 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. Finally, one intervening occurrence which is commonly mentioned as a potential causal factor in cost reductions is the *Alice Corp v. CLS Bank International* case,<sup>14</sup> in which the Supreme Court limited the scope of software cases. Although the patterns in this sector seem to be consistent with these of other technology industries, TPG reduced the computed savings in the software component by 50%. Direct savings over the 2014-19 period were estimated to be \$2.644 billion.

In order to determine the additional savings that would have occurred under Scenario One, the number of proceedings that were not stayed was initially determined through a review of the relevant data.<sup>15</sup> This proportion of total cases was then multiplied by the percentage for which all claims were invalidated to generate an estimated incremental direct savings of \$486,173,843 had this policy been in place.<sup>16</sup> This amount is likely to understate the actual potential benefits in that (1) the knowledge that the court proceedings will be stayed reduces the expected cost of IPR filings, thus incentivizing more filings (and, hence, savings) and (2) ultimate litigation costs are reduced for those patents for which some, but not all, claims are invalidated.

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<sup>13</sup> Landau, Josh, “IPR and Alice Appear Responsible for Reduced Patent Litigation Costs,” Patent Progress, October 18, 2018, <https://www.patentprogress.org/2018/10/18/ipr-and-alice-appear-responsible-for-reduced-patent-litigation-costs/>.

<sup>14</sup> *Id.* See also, for example, Baker Botts, Open to Close: An Empirical Study of Patent Case Termination Times, May 1, 2020, <https://www.bakerbotts.com/insights/publications/2020/may/open-to-close-an-empirical-study-of-patent-case-termination-times>.

<sup>15</sup> Layne-Farrar, Anne S., “The Cost of Doubling Up: An Economic Assessment of Duplication in PTAB Proceedings and Patent Infringement Litigation, *Landslide*, Vol. 10 No. 5 May-June 2018, [https://media.crai.com/wp-content/uploads/2020/09/16163713/The\\_Cost\\_of\\_Doubling\\_Up\\_An\\_Economic\\_Assessment\\_of\\_Duplication\\_in\\_PTAB\\_proceedings\\_Landslide\\_May\\_2018\\_Layne\\_Farrar.pdf](https://media.crai.com/wp-content/uploads/2020/09/16163713/The_Cost_of_Doubling_Up_An_Economic_Assessment_of_Duplication_in_PTAB_proceedings_Landslide_May_2018_Layne_Farrar.pdf).

<sup>16</sup> Pegram, John B., “Inter Partes Review Survival Rates Based on Decision Statistics-A Preliminary Report,” 2018, <https://fordhamipinstitute.com/wp-content/uploads/2018/03/Inter-Partes-Review-Decision-Statistics-2018-04-03.pdf>; and Cuomo, Peter J., William A. Meunier, and Brad M. Scheller, “Avoiding IPR Institution: Your Best Defense to an IPR Challenge,” Mintz, October 2020, <https://www.mintz.com/insights-center/viewpoints/2231/2020-10-27-avoiding-ipr-institution-your-best-defense-ipr-challenge>.

To determine the additional benefits under the assumption that all invalidity defenses had been considered during the relevant period (Scenario Two), it was assumed that the cases for which institutions were not granted were allowed to proceed, thus resulting in additional successful challenges and ultimate costs savings.<sup>17</sup> Using historical patterns in the invalidation of all claims, the resulting direct savings is conservatively estimated to be \$654,674,503.<sup>18</sup> This direct benefit is again likely to be understated for reasons analogous to those described above.

In Scenario Three, it is assumed that both staying court proceedings and allowing consideration of all invalidity defenses had been implemented from the outset. Using the approach described above, the total direct savings were estimated to be \$1,334,987,195. Note that this amount exceeds the sum of the previous two scenarios because the additional cases under the broader framework would also see cost reductions from the lack of overlap in the proceedings.

Once estimates of the direct savings are derived for each of the scenarios and allocated across industrial sectors as discussed above, the overall economic impacts may be determined. The model simulation process employed in this analysis is 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, and numerous other elements. Each of these suppliers must, in turn,

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<sup>17</sup> Cuomo, Peter J., William A. Meunier, and Brad M. Scheller, "Avoiding IPR Institution: Your Best Defense to an IPR Challenge," Mintz, October 2020, <https://www.mintz.com/insights-center/viewpoints/2231/2020-10-27-avoiding-ipr-institution-your-best-defense-ipr-challenge>.

<sup>18</sup> Pegram, John B., "Inter Partes Review Survival Rates Based on Decision Statistics-A Preliminary Report," 2018, <https://fordhamipinstitute.com/wp-content/uploads/2018/03/Inter-Partes-Review-Decision-Statistics-2018-04-03.pdf>; and Cuomo, Peter J., William A. Meunier, and Brad M. Scheller, "Avoiding IPR Institution: Your Best Defense to an IPR Challenge," Mintz, October 2020, <https://www.mintz.com/insights-center/viewpoints/2231/2020-10-27-avoiding-ipr-institution-your-best-defense-ipr-challenge>.

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

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- 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.