

How Remedy Reform Drives Patent Litigation Explosions: Evidence from the eBay Ruling

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August 15, 2026

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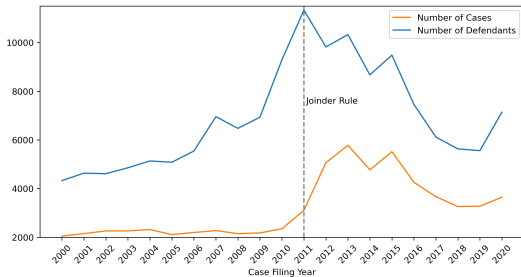
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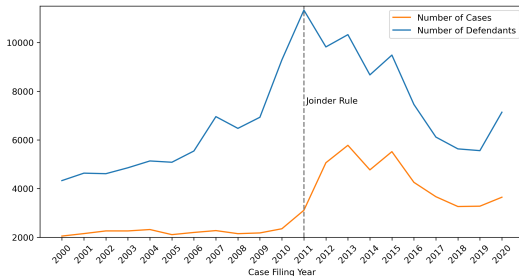
the potential **cost to innovation and economic growth**.

- ▶ for firms: litigation costs, distraction from productive business;
- ▶ for the society: tax judicial resources, judicial congestion.

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Cotropia et al. (2014), Beauchamp (2015)
- ▶ **#defendants:** It didn't disappear but happened earlier.

Question: What caused the explosion? Why did patent asserters (trolls) target more firms in the same cases (by the same patents)?

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Heterogeneous Effects:

- ▶ patent asserters: more trolls are "screened" into court (as plaintiffs), while the effect for practicing-entities is ambiguous;
- ▶ alleged infringers: more firms with higher sales are "screened" into court (as defendants) compared to smaller ones.

Outline

- ▶ Background and Facts
- ▶ Theoretical Analysis
- ▶ Empirical Analysis
- ▶ Conclusion

Background

MercExchange LLC v. eBay Inc.

- MercExchange sued eBay over online auction patents.
- The Supreme Court confirmed eBay's infringement but denied MercExchange's injunction request.

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The eBay Ruling (2006): A patentasser seeking an injunction must satisfy four factors:

- *Irreparable harm* if the injunction is not granted.
- *Inadequate monetary remedies* to fully compensate for the injury.
- *Balance of hardships* between the parties.
- *No harm to public interest.*

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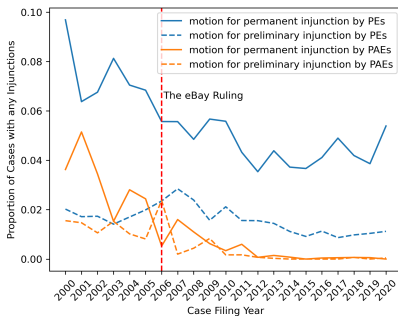
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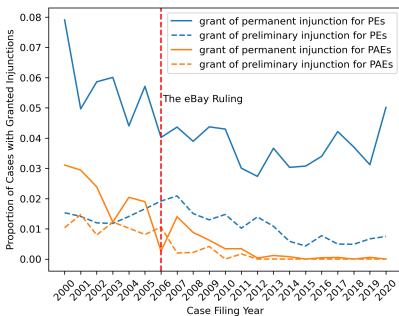
It is harder to get an injunction.

Stylized Facts

Fact 1: Decline in Injunctions Post-eBay



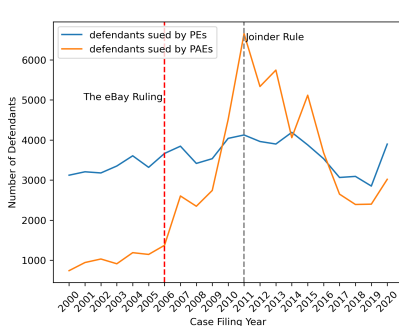
(a) Motion for Injunction Filed



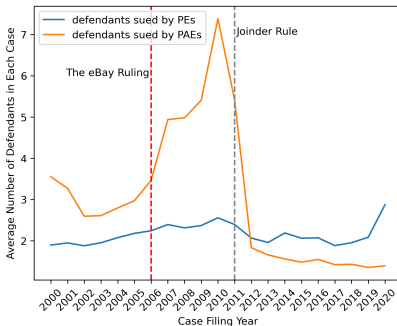
(b) Injunctions Granted

Stylized Facts

Fact 2: Increase in Defendants Sued by trolls Post-eBay



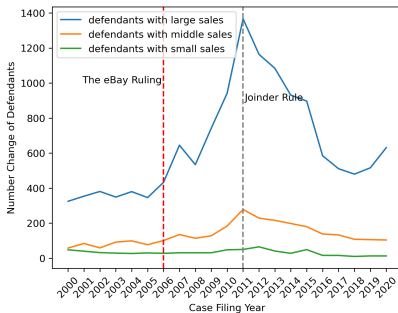
(a) Total Number of Defendants



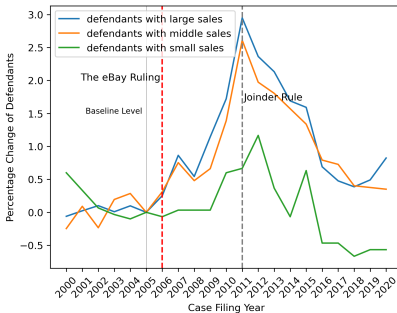
(b) Average Number of Defendants

Stylized Facts

Fact 3: Large Firms are More Likely to be Defendants Post-eBay

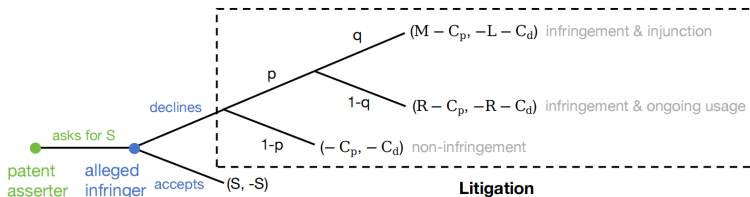


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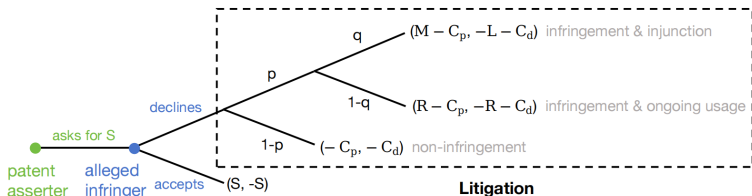


(b) Proportion Change of Defendants

Patent Dispute Model (Screening Model)

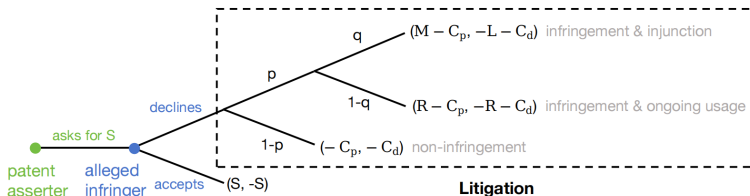


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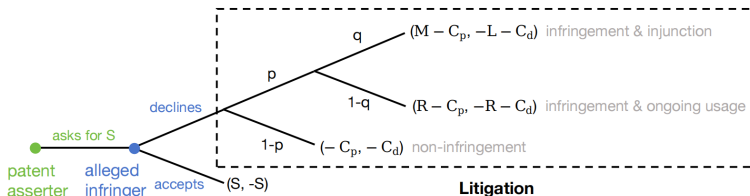
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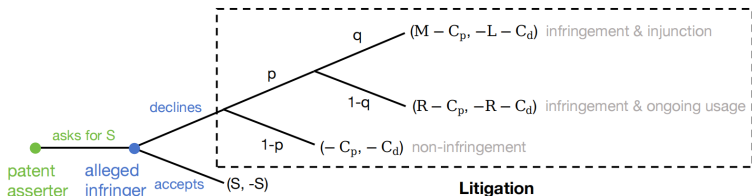
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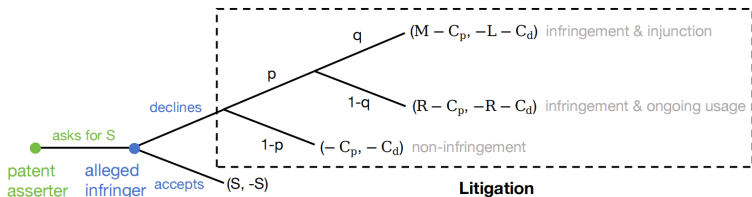
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 - **large L :** more litigation because the payoff in litigation relies more on R other than L (firms with high sales).

Difference-in-Difference

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Sample: panel of Compustat firms in 2000-2020

► Summary Statistics

Treatment: the eBay ruling (policy shock)

Treatment Intensity: sales

	I(Sued)		I(Sued by PAEs)		I(Sued by PEs)	
	(1)	(2)	(3)	(4)	(5)	(6)
log(Sales)	0.0289*** (39.74)	0.00900*** (6.59)	0.0132*** (22.41)	0.000518 (0.46)	0.0214*** (37.99)	0.00855*** (7.88)
I(Post) × log(Sales)	0.0112*** (12.54)	0.0105*** (12.85)	0.0174*** (23.91)	0.0160*** (23.88)	-0.000813 (-1.17)	-0.000967 (-1.49)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	No	Yes	No	Yes	No	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year × Industry FEs	Yes	No	Yes	No	Yes	No
Number of Obs.	85891	85089	85891	85089	85891	85089
Adj. R^2	0.174	0.335	0.188	0.333	0.0832	0.224

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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 - The coefficients are still insignificant for operating firm cases.
- ▶ **Check if large defendants behave differently in court** ▶ advantages in court
 - Large defendants don't have preference on jury trials;
 - Large defendants spend longer time to finish a case, but there is no significant change post-eBay.

Conclusion

A remedy reform from a property rule to a liability rule can change **how patent infringement disputes are resolved**. The effects are heterogeneous on

- ▶ operating firms and trolls
- ▶ firms with high and low sales

This effect explains the patent litigation explosion happened recently, which were driven by **trolls** filing **multi-defendant** cases.

Though the quantity of litigation went down, the proportion change was long lasting.

Thank you!

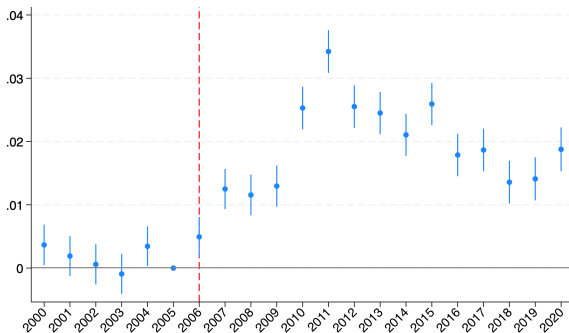
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Summary Statistics of Compustat Firms

	N	Mean	Std	Min	P.25	Median	P.75	Max
<i>Defendants (10%)</i>								
log(Sales)	7877	7.29	2.12	0.00	5.93	7.46	8.82	10.59
log(SaleatRisk)	7877	1.70	2.20	0.00	0.00	0.17	3.20	10.47
log(Market Capitalization)	7501	7.66	2.15	0.35	6.25	7.78	9.27	11.09
Tobin's Q	7868	14088.67	24473.86	2.02	909.78	3346.19	12795.84	92382.43
R&D Intensity	7610	0.08	0.13	0.00	0.01	0.04	0.10	2.07
ROA	7877	0.09	0.24	-5.53	0.06	0.12	0.18	0.42
Leverage	7877	0.24	0.28	0.00	0.03	0.18	0.34	4.15
Cash	7877	0.22	0.20	0.00	0.05	0.15	0.32	0.98
Capital Expenditure	7877	0.05	0.04	0.00	0.02	0.03	0.06	0.37
I(Conglomerate)	7877	0.34	0.47	0.00	0.00	0.00	1.00	1.00
HHI	7877	465.45	1367.08	0.00	0.12	4.89	172.77	10000.00
<i>Non-Defendants (90%)</i>								
log(Sales)	78256	4.70	2.58	0.00	2.90	4.88	6.62	10.59
log(SaleatRisk)	78256	0.64	1.25	0.00	0.00	0.00	0.65	10.51
log(Market Capitalization)	72166	5.17	2.31	0.35	3.46	5.23	6.83	11.09
Tobin's Q	78234	2910.95	9106.80	2.02	67.67	422.10	2087.95	92382.43
R&D Intensity	74360	0.14	0.28	0.00	0.01	0.04	0.15	2.07
ROA	78256	-0.16	0.79	-5.53	-0.12	0.08	0.14	0.42
Leverage	78256	0.31	0.55	0.00	0.01	0.18	0.39	4.15
Cash	78256	0.25	0.27	0.00	0.03	0.13	0.38	0.98
Capital Expenditure	78256	0.05	0.07	0.00	0.01	0.03	0.06	0.37
I(Conglomerate)	78256	0.24	0.43	0.00	0.00	0.00	0.00	1.00
HHI	78256	156.22	843.33	0.00	0.00	0.05	4.27	10000.00

Parallel Trend



◀ Return

Regressions by Technology Sector

	(1) chemical	(2) computer	(3) drug	(4) electrical	(5) mechanical	(6) other
log(Sales)	0.00168** (3.19)	-0.00321** (-2.99)	0.00279*** (5.29)	-0.000471 (-0.69)	-0.000380 (-0.56)	0.00109 (1.58)
$I(\text{Post}) \times \log(\text{Sales})$	0.00169*** (5.36)	0.0186*** (28.93)	0.000895** (2.85)	0.00567*** (13.93)	0.00440*** (10.89)	0.00326*** (7.92)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Number of Obs.	85089	85089	85089	85089	85089	85089
Adj. R^2	0.142	0.339	0.271	0.206	0.116	0.163

t statistics in parentheses

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Sales at Risk as Treatment Intensity

	I(Sued)		I(Sued by PAEs)		I(Sued by PEs)	
	(1)	(2)	(3)	(4)	(5)	(6)
log(SaleatRisk)	0.0338*** (19.83)	-0.000926 (-0.52)	0.0137*** (9.99)	-0.00648*** (-4.40)	0.0251*** (19.21)	0.00254 (1.78)
I(Post) $\times$ log(SaleatRisk)	0.0116*** (6.10)	0.0124*** (7.08)	0.0222*** (14.49)	0.0195*** (13.56)	-0.000287 (-0.20)	0.000115 (0.08)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	No	Yes	No	Yes	No	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year $\times$ Industry FEs	Yes	No	Yes	No	Yes	No
Number of Obs.	85891	85089	85891	85089	85891	85089
Adj. R^2	0.133	0.334	0.161	0.329	0.0592	0.223

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Advantages in Court

	OLS		DD		DDD	
	(1)	(2)	(3)	(4)	(5)	(6)
log(Sales)	-0.000881 (-0.15)	0.0295* (2.15)	0.00247 (0.35)	0.0304 (1.87)	0.00150 (0.20)	0.0193 (1.14)
I(Post) × log(Sales)			-0.00485 (-0.89)	-0.00120 (-0.10)	-0.00682 (-1.07)	-0.00101 (-0.07)
I(Post) × I(PAEs) × log(Sales)					0.00451 (0.43)	0.00680 (0.28)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year × Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes
Number of Obs.	17039	16720	17039	16720	17039	16720
Adj. R^2	0.133	0.148	0.133	0.148	0.133	0.150

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