Platform Liability and Innovation

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Motivation

E-commerce platforms represent ideal storefronts for counterfeits…and provide powerful platform[s] for counterfeiters and pirates to engage large numbers of potential consumers.

- Organisation for Economic Cooperation and Development[4]

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TECHNOLOGY

Amazon May Have a Counterfeit Problem

The company is facing multiple lawsuits from brands who say it does not do enough to prevent fakes from being listed on its website.

ALANA SEMUELS APRIL 20, 2018

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Business

Nike Pulling Its Products From Amazon in E-Commerce Pivot

Platforms’ response

- Amazon launched Project Zero
- Powered by machine learning expertise, automated protections scan stores and remove suspected counterfeits.
- Amazon "seized and destroyed" **over 2 million** counterfeit products that sellers sent to Amazon warehouses in 2020

Main question

- Should e-commerce platforms be held liable for third-party sellers' misconduct when primary liability is not enforceable?

Platform liability in the paper

- We suppose:

- Primary liability is not enforceable because sellers are located in different jurisdictions or judgment-proof

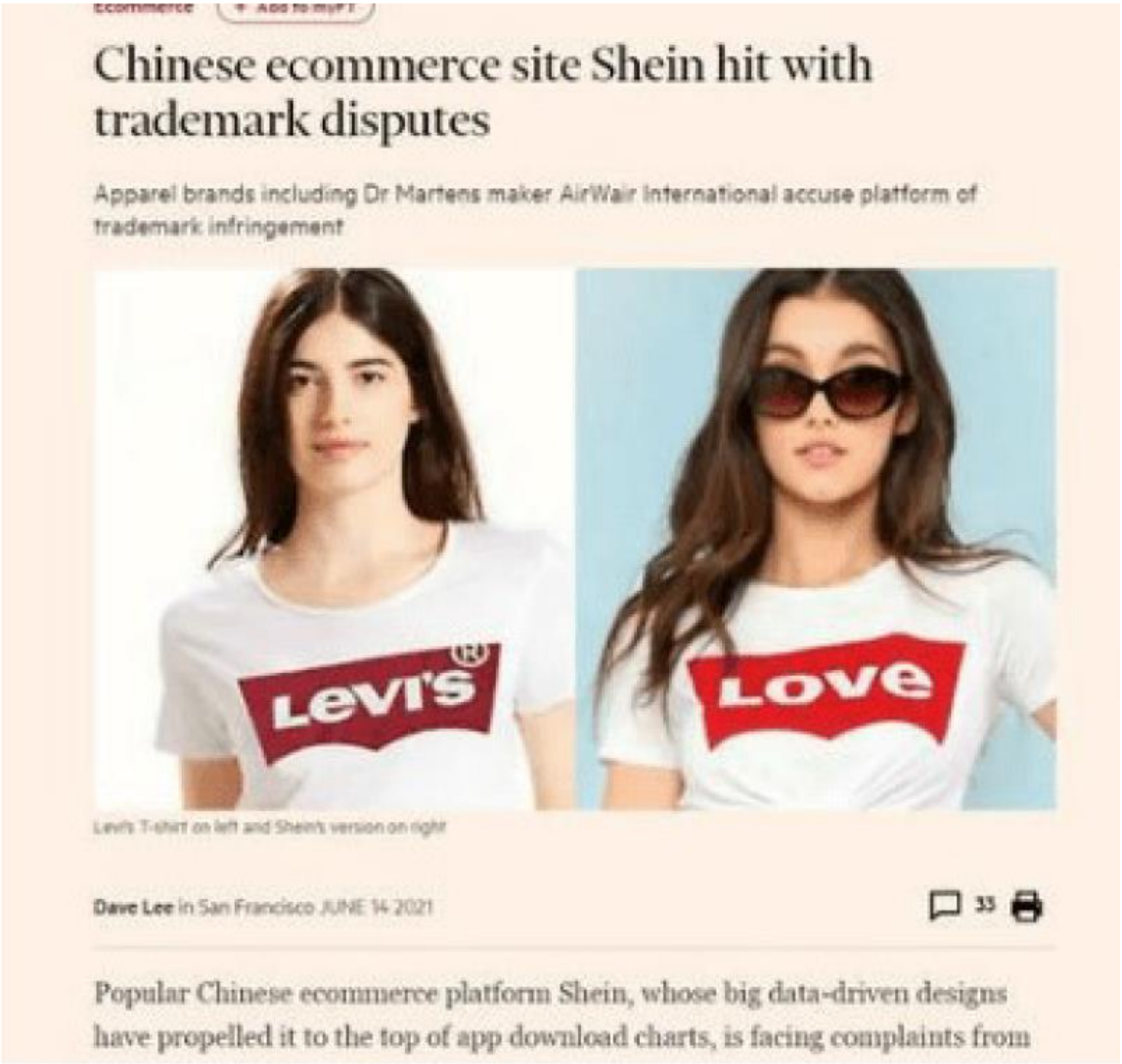
- Negligence-based liability: the regulator imposes a minimum screening intensity, which platforms should ensure to benefit from liability exemption

- The platform finds it optimal to comply

- The imposed screening intensity forces the platform to raise its screening

Our focus

- We focus on counterfeits that are not deceptive: they are simply low quality products but violate IPs
- Some consumers like these products



Chinese ecommerce site Shein hit with trademark disputes

Apparel brands including Dr Martens maker AirWair International accuse platform of trademark infringement

Levi's T-shirt on left and Shein's version on right

Dave Lee in San Francisco JUNE 14 2021

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Popular Chinese ecommerce platform Shein, whose big data-driven designs have propelled it to the top of app download charts, is facing complaints from

We do NOT consider

- Neither deceptive products nor harmful products

1. Deceptive products are not an issue when platforms use a free return policy
2. Harmful products:

- It is not obvious to build a convincing model in which platforms prefer bad actors to sell products with negative values on their marketplaces

- Hua and Spier (2021) assume both no commitment and unobservability regarding screening intensity, which is opposite to our choice

Overview of the main questions

1. In the absence of platform liability, does the platform have an incentive to screen out illegal copycats?
2. How does the introduction of platform liability affect

- the innovation incentive of innovators

and

- consumer surplus?

Overview of the key mechanisms

- Intended effects: A platform liability which forces the platform to increase the screening intensity reduces the competition faced by innovative products and thereby boosts innovation
- Unintended effects:

- Platform liability induces the platform to change its commission.
- Platform liability changes buyer participation

Roadmap

1. The baseline model with inelastic buyer participation

1.1 No liability benchmark

1.2 Analysis

2. Elastic buyer participation

3. A scenario in favor of platform liability

4. Other extensions/discussions

5. Conclusion

The baseline model with inelastic buyer participation

Baseline model: innovators and imitators

- We consider a monopoly e-commerce platform
- Innovators (=brand owners)
- Each innovator incurs a fixed cost to develop an innovative product.
- Innovators are homogenous but for their fixed cost of innovation, which is distributed according to a c.d.f. $F(\cdot)$ with density $f(.)$
- If an innovative product is developed, the respective product category is realized.
- Innovators can sell their product through direct channels
- We set marginal costs equal to zero, for simplicity

Baseline model: innovators and imitators

- Imitators (=copycats)
- In each product category, there is one imitation of the innovative product
- An imitated product is both vertically and horizontally differentiated from the innovative product
- With probability $\nu \in (0,1)$, the imitation is legitimate
- With probabiliy 1-ν, the imitation infringes IP
- Both types of imitations differ only in the IP-infringement aspect
- The platform can delist IP-infringing imitations at some cost

Baseline model: innovators and imitators

- Innovator's profit if it is a monopolist: π_I^m
- Innovator's profit if it faces competition from an imitator: π_I^d
- An imitator's profit: π_C^d

- **Assumption 1**: $\pi_I^m > \pi_I^d > \pi_C^d$

- Remark: the total profit can be higher either under monopoly ($\pi_I^m > \pi_I^d + \pi_C^d$) or under duopoly ($\pi_I^m < \pi_I^d + \pi_C^d$)

Baseline model: buyers

- Mass 1 of homogenous buyers with *inelastic participation*
- $\lambda \in (0,1)$ fraction of them are captive and use only the platform and 1-λ fraction can use both the platform and direct channels
- A buyer's utility from an imitation does not depend on whether or not it infringes IP.
- A buyer's expected utility from a product category is

- u^d if there is competition in the category
- u^m if there is no competition in the category

- **Assumption 2**: $u^d > u^m$

Baseline model: the platform

- A monopoly e-commerce platform
- The plaform chooses an ad valorem commission $\tau \in [0,1]$
- It also chooses the screening intensity $\phi \in [0,1]$

- Only IP-infringers can be delisted
- Screening is costly, $\Omega(0)=0$ and $\Omega'(\phi)>0$

Baseline model: Timing

1. The platform chooses its commission rate τ and its screening intensity ϕ
2. Innovators incur their fixed cost of innovation; then the respective product categories are realized. They decide to join the platform.
3. Imitators join the platform. The platform screens IP-infringers.
4. Buyers make their purchasing decisions.

(Expected) profits: brand owners, imitators and the platform

- Given ϕ, an innovator's expected gross profit from joining the platform is

$$\pi_I(\phi) = \underbrace{(1-\nu)\phi}_{\text{Prob. of monopoly}} \pi_I^m + \underbrace{(1-(1-\nu)\phi)}_{\text{Prob. of duopoly}} \pi_I^d$$

- Hence, the mass of brand owners on board is $F((1-\tau)\pi_I)$
- The expected per category profit of imitators is

$$\pi_C(\phi) \equiv (1-(1-\nu)\phi)\pi_C^d$$

- The platform's profit is

$$\Pi(\phi,\tau) = \tau F((1-\tau)\pi_I(\phi))(\pi_I(\phi)+\pi_C(\phi)) - \Omega(\phi)$$

No liability benchmark: platform as a private regulator of IP

No liability: the platform's choice of screening intensity ϕ

- Given commission τ, an increase in the screening intensity ϕ

(i) Increases the expected profit of a brand owner ($\frac{\partial \pi_I}{\partial \phi} > 0$) and thereby increases the amount of innovation $F((1-\tau)\pi_I)$

(ii) Reduces or increases the total profit per category

$$\frac{\partial(\pi_I + \pi_C)}{\partial \partial \phi} = \pi_I^m - (\pi_I^d + \pi_C^d) \gtreqless 0$$

$$\Pi(\phi, \tau) = \tau F((1-\tau)\pi_I(\phi))(\pi_I(\phi) + \pi_C(\phi)) - \Omega(\phi)$$

Analysis of the baseline model

Commission chosen by the platform

- Case 1: the participation constraint (PC) binds for innovators ($\tau^*=\lambda$)

$$(PC_I) \quad (1-\tau)\pi_I \geq (1-\lambda)\pi_I$$

- Case 2: (PC_I) does not bind ($\tau^*<\lambda$)

- **Proposition 2**: When (PC_I) does not bind, platform liablity induces the platform to raise (lower) the commission if and only if $\varepsilon_F-\varepsilon_f>(<)1$

The impact of platform liability on innovation

- Case 1: (PC_I) binds

$\Rightarrow$ Platform liability raises the amount of innovation.

- Case 2: (PC_I) does not bind

- **Proposition 3**: When (PC_I) does not bind, platform liability raises the amount of innovation even if it induces the platform to increase its commission

Impact of platform liability on consumer surplus

- Consumer surplus per product category

$$u(\phi) = (1-\nu)\phi u^m + (1-(1-\nu)\phi)u^d$$

- Let $n_I(\phi) \equiv F((1-\tau)\pi_I)$ denote the number of innovative products
- Consumer surplus is $CS(\phi) = n_I(\phi)u(\phi)$
- **Proposition 4**: When (PC_I) binds (and hence $\tau^*=\lambda$), platform liability increases (reduces) consumer surplus if

$$\frac{n_I'(\phi)}{n_I(\phi)} > (<) - \frac{u'(\phi)}{u(\phi)}$$

where $u'(\phi)=(1-\nu)(u^m-u^d)<0$

Elastic consumer participation

Elastic participation

- The utility of a consumer who joins the platform is given by

$$n_l(\phi)u(\phi) - n_l(\phi)\gamma - \xi$$

where

(i) γ represents per-category opportunity cost and is distributed according to cdf G() with density g()

(ii) ξ represents per-platform opportunity cost and is distributed according to cdf H() with density h()

Per-category opportunity cost (ξ=0) (Hagiu, Teh and Wright, RJE, forthcoming)

- Consumer demand $D(\phi)=G(u(\phi))$
- Hence, $D'(\phi)=g()u'(\phi)<0$
- Platform liability inreases (reduces) innovation if

$$\frac{\pi_I'(\phi)}{\pi_I(\phi)} > (<) - \frac{gu'(\phi)}{G}$$

- Platform liability increases CS if

$$\frac{\frac{\partial n_I}{\partial \pi_I}\pi_I'(\phi) + \frac{\partial n_I}{\partial \pi_I}D'(\phi)}{n_I} > -\frac{u'}{u-\gamma^e}$$

Per-platform opportunity cost (γ)

- Consumer demand $D(\phi)=H(n_I(\phi)u(\phi))$
- $n_I(\phi) = F((1-\tau)\pi_I(\phi)D(\phi))$
- $D'(\phi)>0$ (i.e., platform liability increases CS) if

$$\frac{\frac{\partial n_I}{\partial \pi_I}\pi_I'(\phi)}{n_I} > -\frac{u'(\phi)}{u(\phi)}$$

- Then, platform liability increases innovation CS

A scenario in favor of platform liability

Copycats reduce reservation utility of innovators

- Suppose that an innovator does not join the platform and sells its product through direct channels only, which is an off-equilibrium event
- λ fraction of captive consumers consume copycats
- 1-λ fraction of consumers start search within the platform

(i) If they find no product at all, all of them incur a search cost to look for the product outside of the platform

(ii) If they find a copycat, some of them do not incur the search cost to look for the product outside of the platform

Copycats reduce reservation utility of innovators

- The participation constraint becomes,

$$(PC_I) \quad (1-\tau)\pi_I \geq (1-\lambda)(\pi_I - (1-(1-\nu)\phi)\Delta)$$

where Δ represents harm to innovators from copycats

- When the constraint binds, the commission decreases with ϕ: the platform has an incentive to encourage imitations to extract more surplus from innovators.
- **Proposition 5**: When copycats reduce the reservation utility of innovators and (PC_I) binds, platform liability increase innovation both directly and indirectly (i.e. by reducing the commission).

Extensions/discussions

Other unintended effects

- Endogenous infringment
- Change in the platform business model to the hybrid one

No commitment to screening

- Platform liability can mitigate hold-up and increase the platform's profit

Conclusion

- Platform liability can have intended and unintended effects,
- We examine various unintended effects, which can be positive or negative.
- Consumer participation: per-platform (per-category) opportunity costs tend to make platform liability more (less) desirable
- There are circumstances in which platform liability can benefit both innovators and consumers. But there can be a tension between innovators and consumers so that platform liability may reduce consumer surplus. If this reduces a lot consumer participation, platform liability can even harm innovators.
- We identified also a scenario in favor of platform liability.

Thank you !