

PINDUODUO

Why Did PDD Take Off ?

— A platform economics-based perspective.

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Lei Cheng, Chang Li

Team Up, Price Down!

Team Up for Savings | Deals | Welcome Surprises !





PINDUODUO

PART 01

*Platform
Introduction*

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Analysis*

PART 04

Conclusion

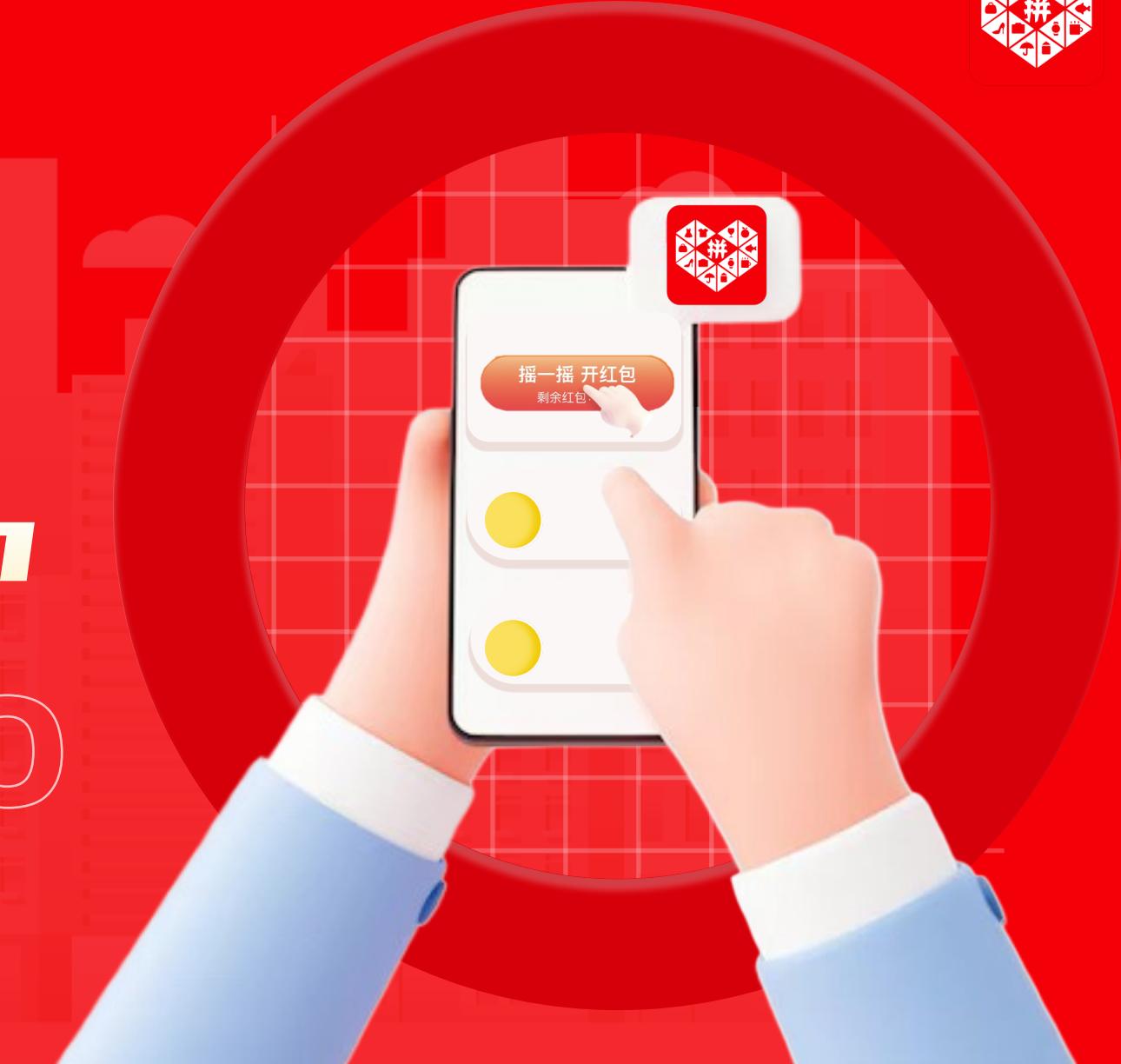




PART 01 *Platform*

Introduction

PINDUODUO



Team Up, Price Down!

Team Up for Savings | Deals | Welcome Surprises !

1.1 Take Off of PDD



Pinduoduo (PDD) is a mainstream e-commerce platform on China's mobile internet.

- ❖ It is a third-party social e-commerce platform that specializes in *C2M group shopping*.
- ❖ Users can initiate group purchases with friends, family, neighbors, etc. to *buy goods at lower prices*.



Founder
Huang Zheng



Created
September 2015

Revenue
GMV

Number of Active Buyer
Taking Off !

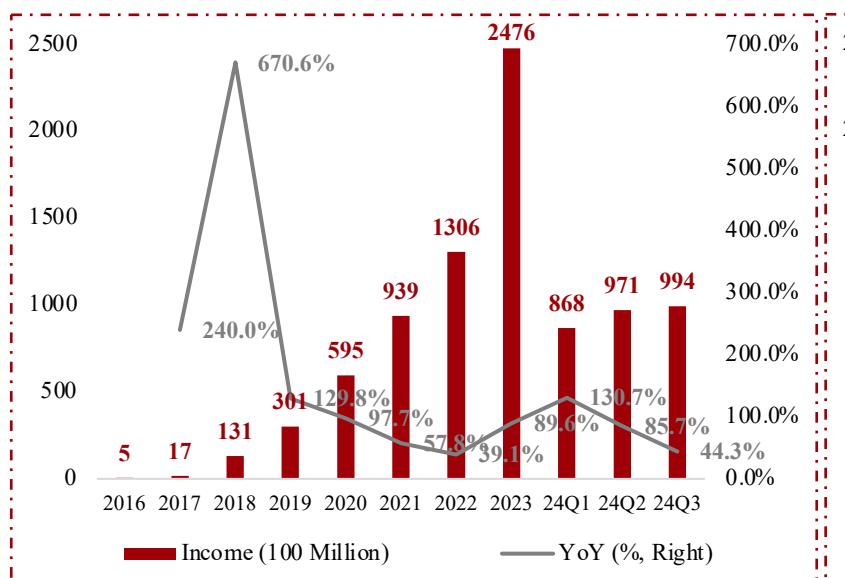


Fig 1.1 PDD Revenue and Growth Rate
(2016 – 2022 Q3)

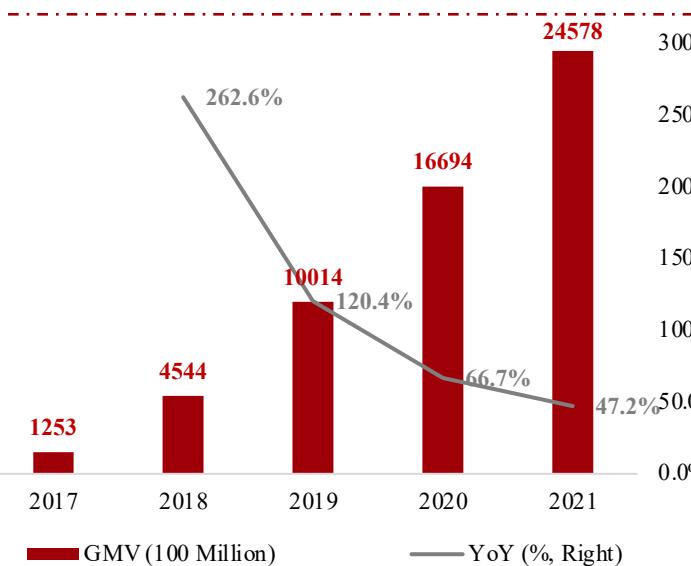


Fig 1.2 PDD GMV and Growth Rate
(2017 – 2021)

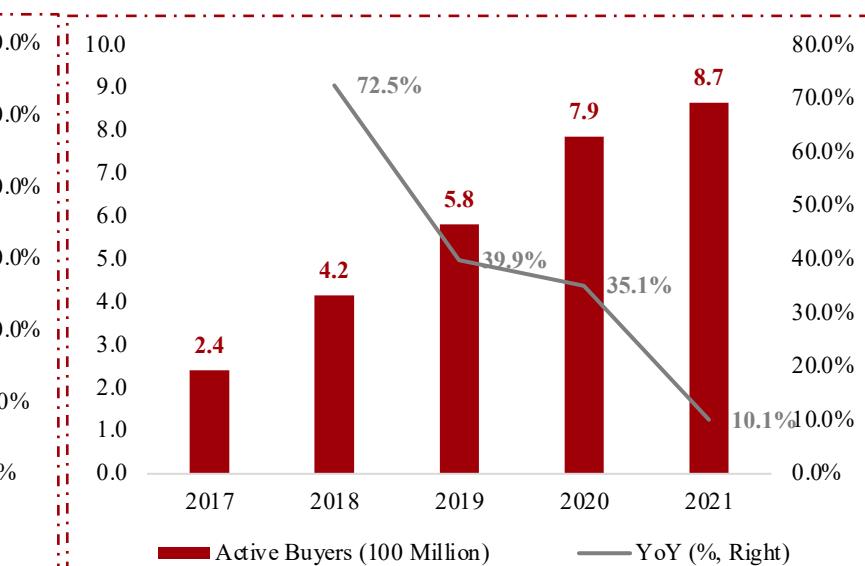


Fig 1.3 PDD Active Buyer and Growth Rate
(2017 – 2021)



1.2 Development Path

2015

April, Pinhaohuo was launched on WeChat.

2016

September, Pinduoduo official account launched. Two weeks fans broke ten thousand.

2017

September, its annual active buyers exceeded 200 million.

2018

Officially listed on NASDAQ in July.

2019

In June, launched a “10 billion yuan subsidy”. GMV breaks through “trillion”.

2020

DuoDuo Grocery was launched in August. The number of annual active buyers on the platform reached 730 million.

2021

“Ten Billion Agricultural Research” program was announced.

2023

Market capitalization surpassed Alibaba's for the first time.

2024

“Ten Billion Relief” program was announced.

PDD has achieved steady growth and a rapid rise !

1.3 Platform Overview



14 primary classifications for searching.

4. Recommendation System

21:21
政府补贴 可享8折
百亿补贴再叠加 快来抢购
百亿加倍补
抽抽乐
150元 消费券
21:20
多人团
发起多人团 邀人拼单 成团发货
底价团秒杀 多人团购超低价爆款商品
新货娃哈哈ad钙
丽丽5层卫生纸9
新西兰安佳淡奶油
¥27
¥31.9
¥75.6
21:20
限时利杀
万人团
拼团价更低
4亿人拼单
查看更多>
补贴23.4元
直降20.9元
直降20元
补贴11元
专属补贴
1元抢
加补5.54元
加补10.51元
加补4.9元
加补17.34元
¥35.91
¥7.11
¥17.91
¥43.91
店铺 收藏 客服
¥20.9
单独购买
¥7.9
4人团专享

2. Platform Pricing

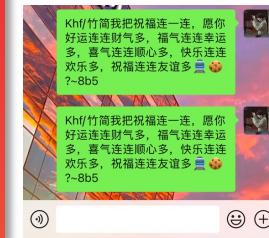
20:55
Q 惠普暗影精灵乐享版
推荐 电脑 食品 电器 手机 男装 百货
拼小圈
查看好友动态 >
秒
限时秒杀 补贴多人团 现金大转盘 免费领水果
领
多多买菜 次日自提
百亿补贴
¥6298
¥4060
¥8349
¥7.99
¥11.99
¥8.99
SNICKERS 巧克力
养胃苏打
早餐就吃它
优惠券
夏上新大促
聊天
个人中心
首页
多多视频

3. Online Reputation

正品保障 买贵双倍赔
官方补贴 假一赔十 退货包运费
优质服务保障
轻灵服装专营店
已拼5.7万件 316人关注 ★★★★
店铺人气
该店近3月新增2.1万好评
1.5万+人收藏该店铺商品 全店已拼5.7万件
全店回购7404件 该店累计2.2万条评论

Circle of Friends in PDD to build friendships.

Invite Friends for Cash

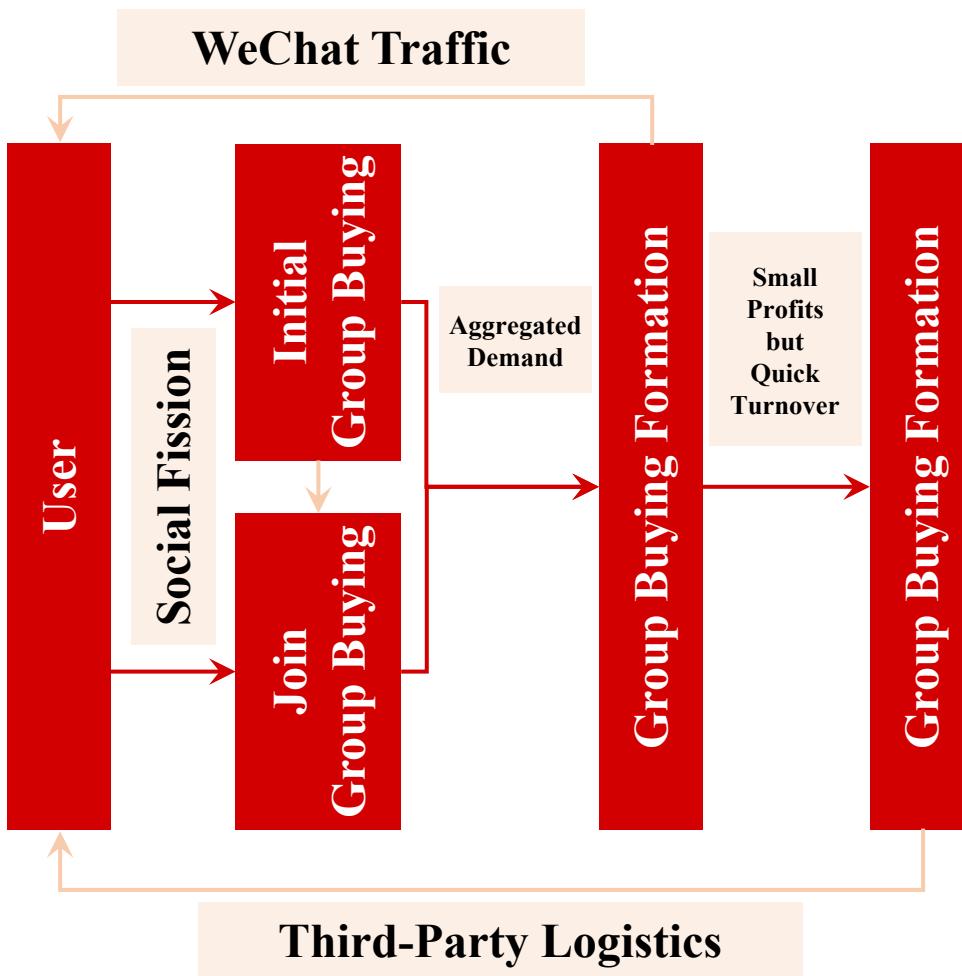


1. Network Effect

Project Framework



PDD "Products Find People"
Team Up for Low Price Logic



PDD Introduction
Why PDD Take Off ?

1. Network Effect
2. Platform Pricing
3. Online Reputation
4. Recommendation System

Theoretical Analysis
How does PDD deal with the problem of fakes ?

Extension
*Can PDD's path to success be replicated ?
What is the future direction of PDD ?*

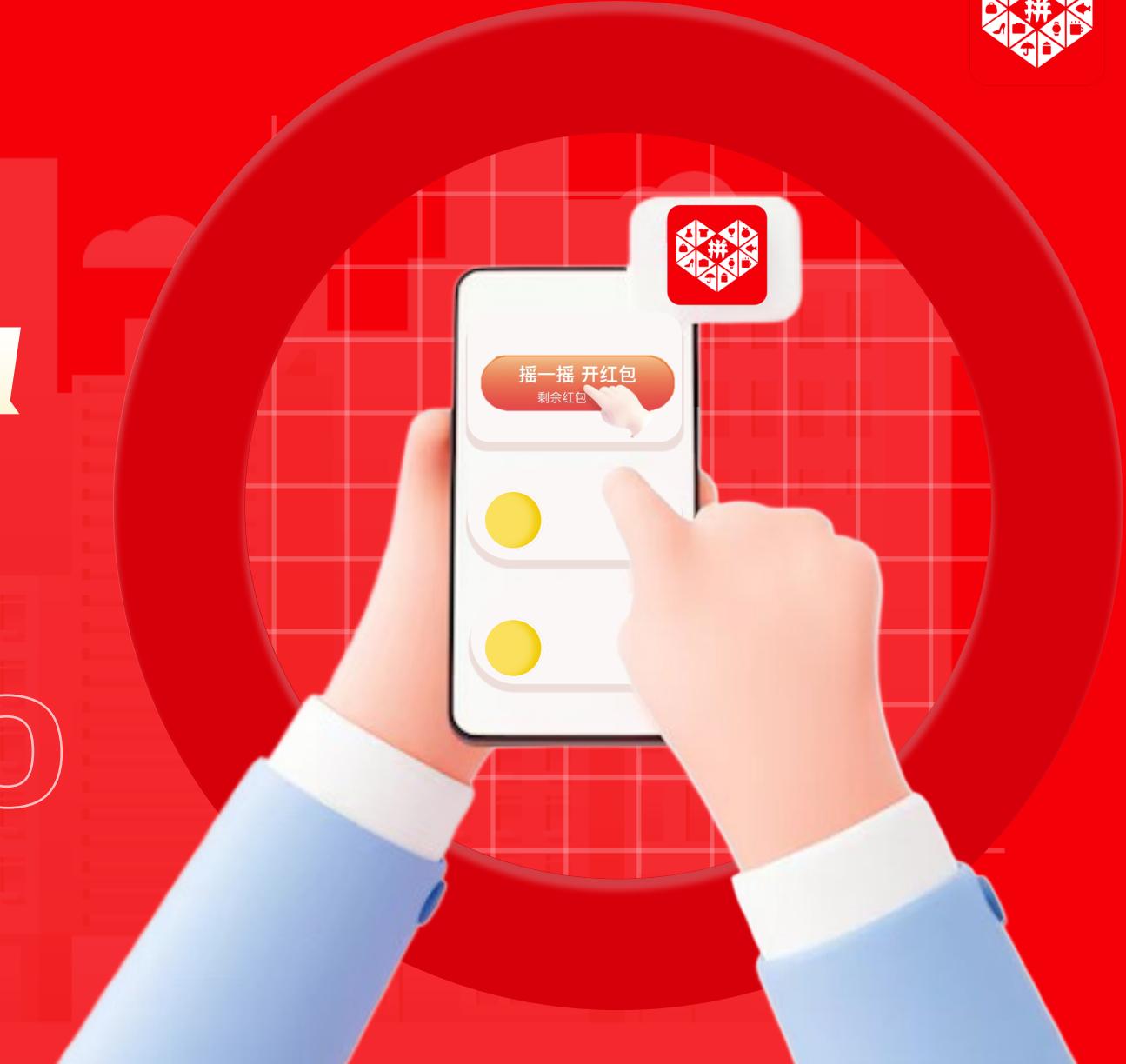
Conclusion



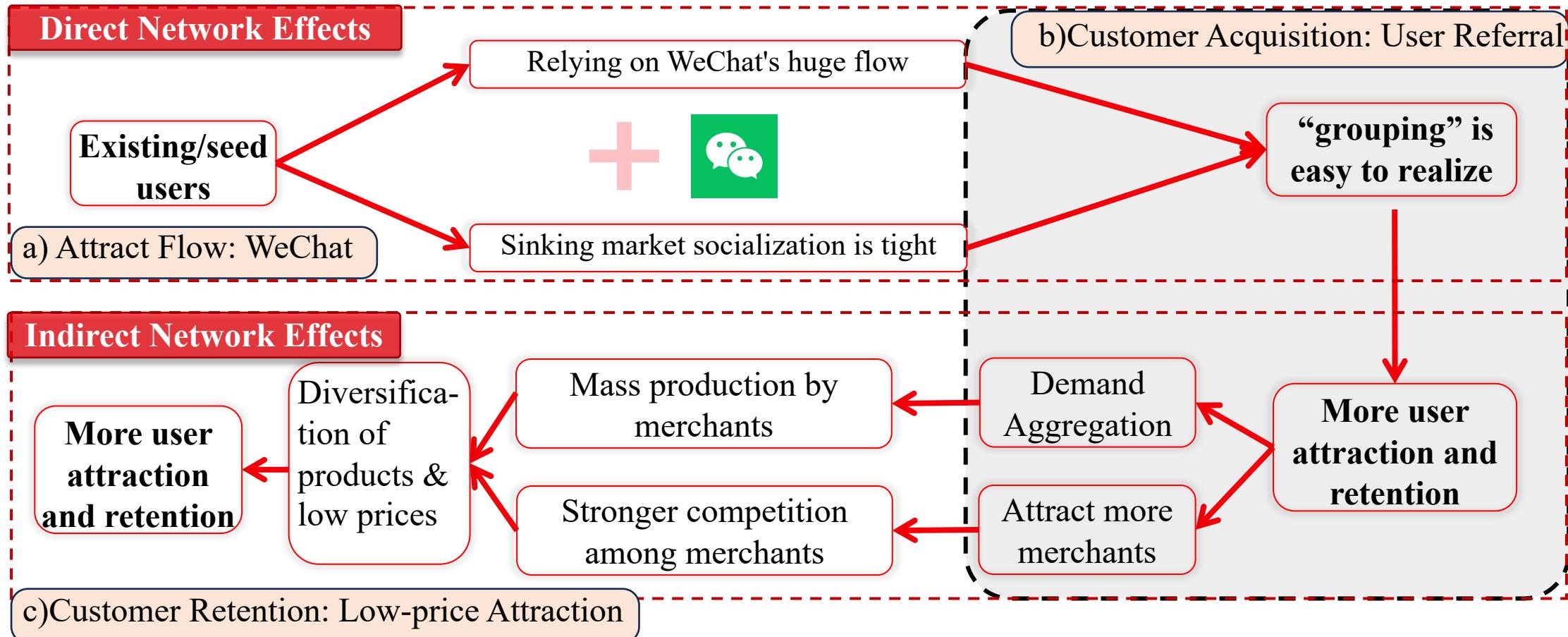
PART 02

Theoretical Analysis

PINDUODUO



2.1.1 Direct and Indirect Network Effects Overview



a) Attract Flow → b) Customer Acquisition = **Direct Network Effects**

b) Customer Acquisition → c) Customer Retention = **Indirect Network Effects**

2.1.2 Direct Network Effects



PROCESS

Existing/seed users

Relying on WeChat's huge flow



“Grouping” is easy to realize

More user attraction and retention

a) Attract Flow: WeChat

Sinking market socialization is tight

b) Customer Acquisition: User Referral

Precondition 01

WeChat for Attraction

- ✓ Easy to sign-up
- ✓ Seamless integration
- ✓ Viral spread
- ✓ Low-cost sharing



Key Factor 02

Sinking Market Group Purchase

- ✓ Price-sensitive “sinking users”
- ✓ Utility: price savings > social cost
- ✓ Tight Social circles thus easy to spread

Core Strategy 03

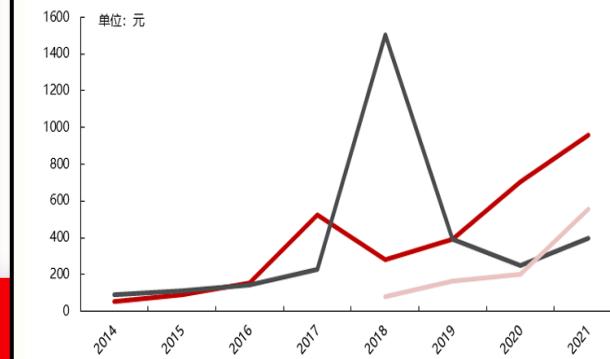
Viruses-Like Spreading Model

- ✓ Bargain Slash, “砍一刀”
- ✓ Sharing red packets
- ✓ **Group buying** with acquaintances.
- ✓

Low CAC 04

Of PDD

— 阿里 — 京东 — 拼多多

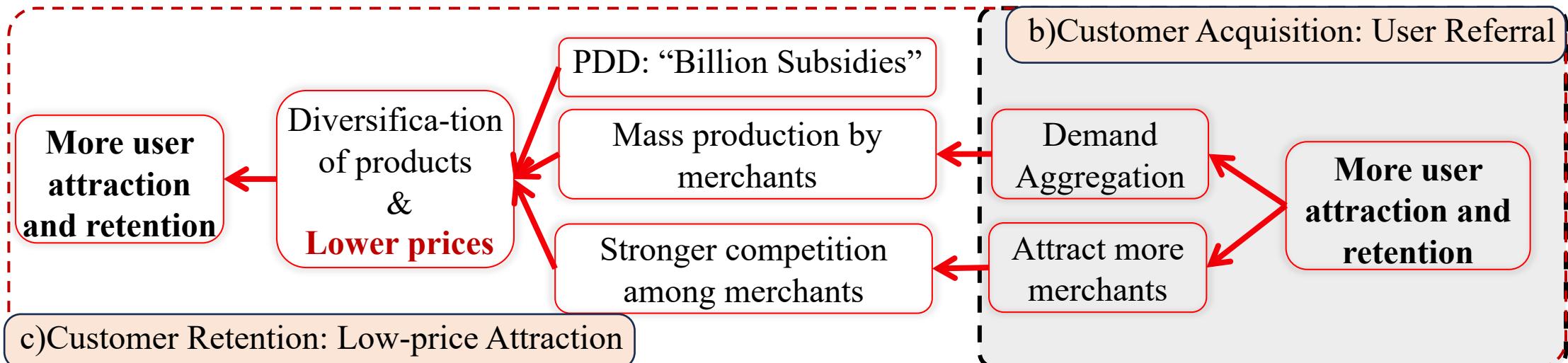


Purpose —— Reducing Customer Acquisition Cost (CAC).

2.1.3 Indirect Network Effects



PROCESS



Benefits

Of indirect network effects

Merchant Side

Attracting Merchants

User Side

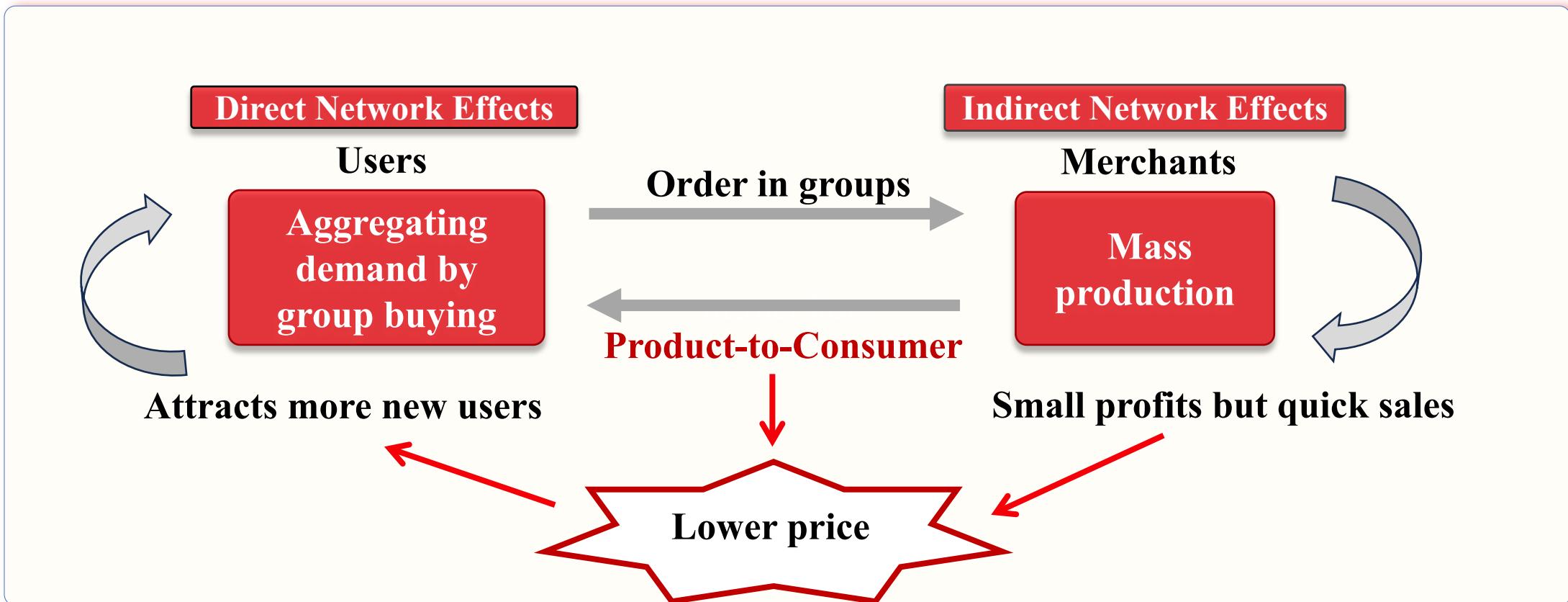
Increase in User Benefits



2.1.4 Result of direct & indirect network effect



Network Effects Cycle



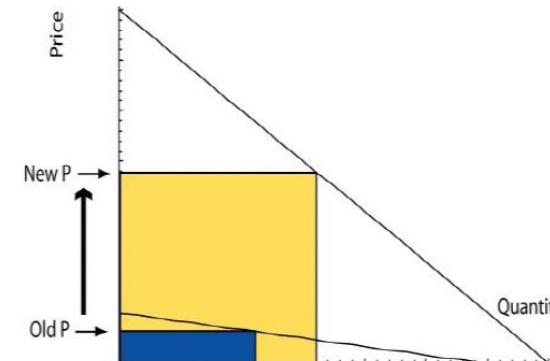
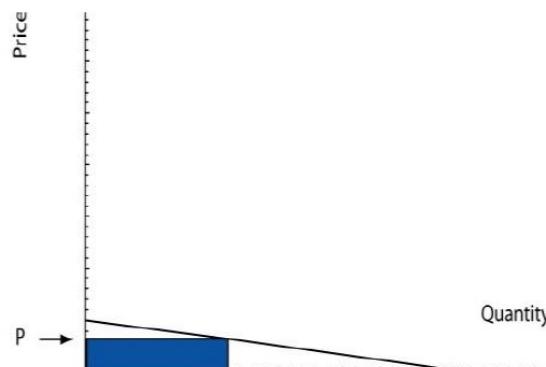
2.2.1 Divide-and-conquer strategy



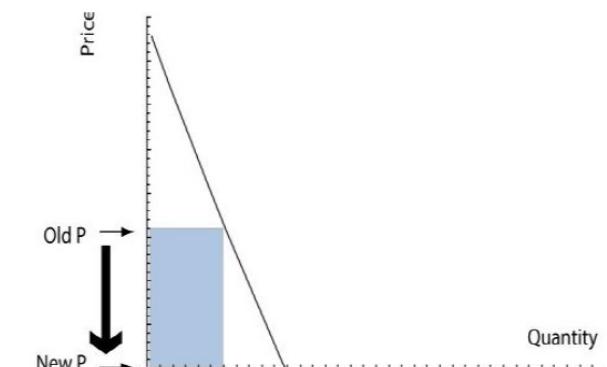
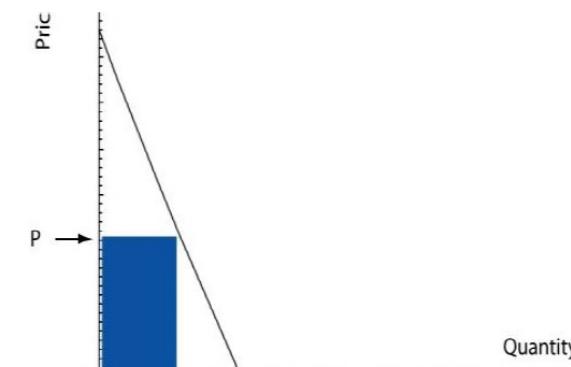
PDD dominates China's e-commerce through social group buying and direct factory sales. By cutting middlemen and using WeChat's network, it delivers ultra-low prices to cost-conscious shoppers nationwide. Its C2M model and gamified promotions make online shopping affordable across all city tiers.

Platform	Profit making group	Subsidized group
PDD	MERCHANTS	Consumers

Market One: Consumers



Market Two: Developers



2.2.1 Divide-and-conquer strategy



Why do platforms have the ability to adopt this pricing strategy ?

01 Attract Sellers

Low-Cost Entry & Traffic Support

- ❖ **Zero/low fees:** Early no-commission policy (later minimal fees) lowers entry barriers.
- ❖ **Social traffic:** Group-buying via WeChat enables viral exposure without ads.
- ❖ **Farmers' support:** Zero fees, logistics aid, and traffic priority for direct farm-to-consumer sales.

02 Reduce Costs

Streamlined Supply Chain

- ❖ **C2M model:** Direct factory-to-consumer sales, using data to guide production.
- ❖ **Simplified marketing:** Algorithm-driven “goods-find-people” promotions cut ad costs.
- ❖ **3PL logistics:** Outsourced delivery with bulk discounts.

03 Squeeze Supplier Margins

Strict Pricing Control

- ❖ **Bid-based ranking:** Sellers compete on price for visibility.
- ❖ **Bulk order discounts:** Group buys lock in lower supplier prices.
- ❖ **Penalties:** Fines for delays/defects balance low prices with reliability.

04 Subsidize Users

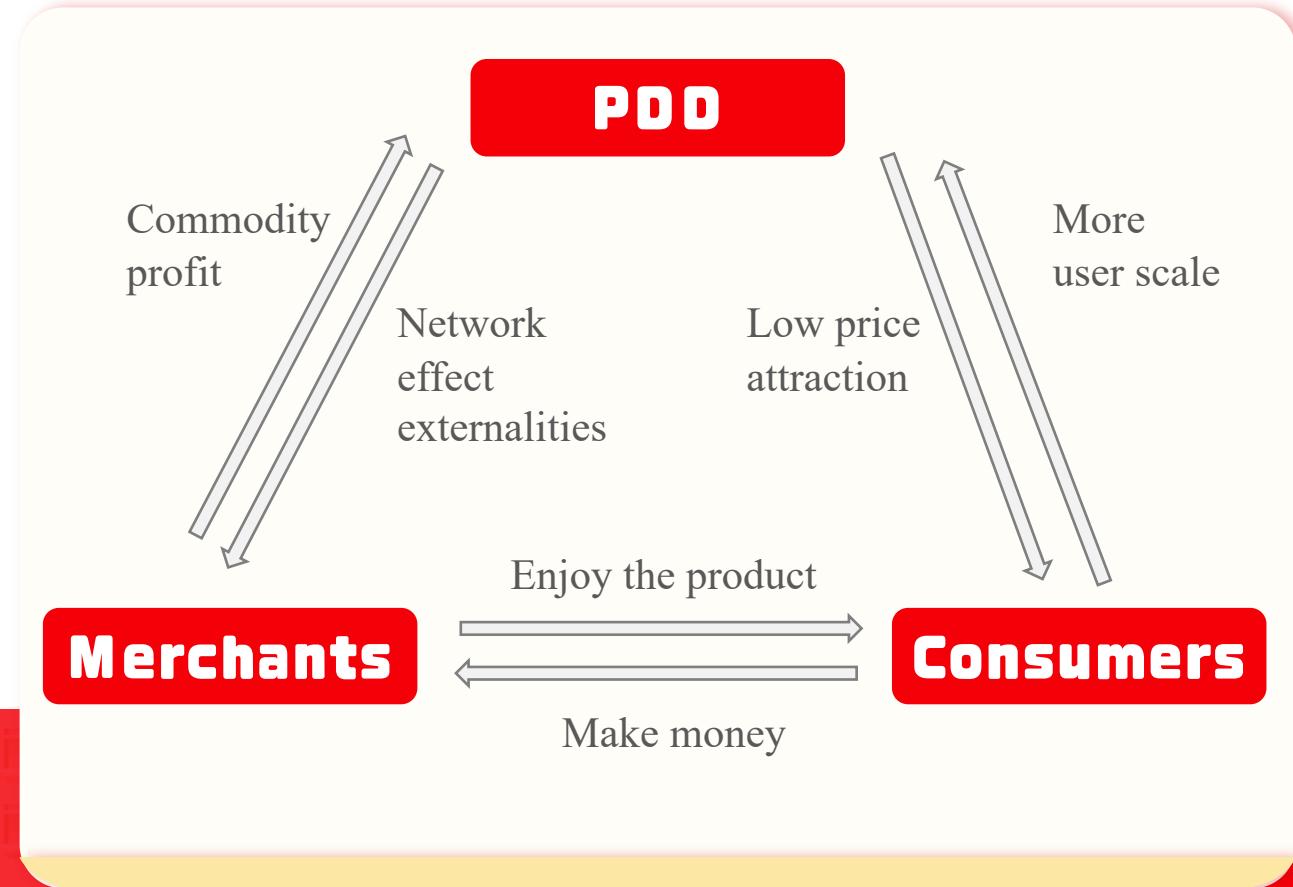
Viral Discounts & “Lowest Price” Branding

- ❖ **“Billions Subsidies”:** Discounts on iPhones/Dyson to attract premium shoppers.
- ❖ **Social sharing:** Group buys/referral discounts drive low-cost acquisition.
- ❖ **Gamification:** E.g., “Duo Duo Orchard” rewards engagement with free produce.



2.2.1 Divide-and-conquer strategy

On PDD, pricing depends not only on the demand and cost from marginal cost and elasticity of demand, but also on how their participation affects participation on the other side, and the profits associated with the other side.



2.2.2 Two-sided Market Pricing



Model setting and Variables

By introducing the linear Hotelling model, social e-commerce platforms A and B are respectively located at the two ends of the line segment [0,1].

- $n_{si}, n_{bi} (i = A, B)$: The number and scale of merchants and consumers in the two social e-commerce platforms.
- $U_{si}, U_{bi} (i = A, B)$: Utility obtained by two-sided users on social e-commerce platforms.
- λ : Strength of cross-network externalities between two-sided users on the social e-commerce platform.
- $P_{si}, P_{bi} (i = A, B)$: Pricing of two-sided users by social e-commerce platform i.
- $e_i (i = A, B)$: Marketing service level of platform products.
- $t_i (i = A, B)$: Transfer costs of consumers and merchants to social e-commerce platforms A and B.

2.2.2 Two-sided Market Pricing



Utility and Profit Function

Consumer Utility Function

$$U_{bi} = \lambda n_{si} + e_i \xi - \beta \theta - P_{bi} \quad (i = A, B)$$

- λn_{si} : Utility from cross-network externalities between merchants and users
- e_i : Utility obtained from consumers' information production and sharing on social e-commerce platforms
- $-\beta \theta$: Disutility from social costs incurred by the recipient's rejection of information
- $-P_{bi}$: Cost of membership fees paid by consumers to the platform

Merchant Utility Function

$$U_{si} = \lambda n_{bi} + e_i \xi - P_{si} \quad (i = A, B)$$

- λn_{bi} : Utility from cross-network externalities between merchants and users
- e_i : Utility brought by consumers' information production and sharing to merchants
- $-P_{si}$: Disutility from marketing service fees paid by merchants to the platform

2.2.2 Two-sided Market Pricing



Utility and Profit Function

Profit Function of Social E-commerce Platform

$$\pi_A = P_{bA}n_{bA} + P_{sA}n_{sA} - \frac{1}{2}ke_A^2$$

$$\pi_B = P_{bB}n_{bB} + P_{sB}n_{sB} - \frac{1}{2}ke_B^2$$

- $\frac{1}{2}ke_i^2$: Marketing service cost of the social e-commerce platform

User Distribution and Distance Parameters

- $n_{bA} + n_{bB} = 1, \quad n_{sA} + n_{sB} = 1$: Consumers and merchants can only choose one platform (A or B) (单归属)
- x : Distance between a consumer on $[0,1]$ and platform A; y : Distance between a merchant on $[0,1]$ and platform B
- x^* and y^* : Indifference points for consumers and merchants joining platforms A and B
- $n_{bA} = x^*, \quad n_{bB} = 1 - x^*, \quad n_{sA} = y^*, \quad n_{sB} = 1 - y^*$

2.2.2 Two-sided Market Pricing



Utility Indifference Points

- Utility of consumers and merchants at x^* and y^* , respectively:

$$\begin{aligned}\lambda n_{sA} + e_A \xi - \beta \theta - P_{bA} - t_b x^* &= \lambda n_{sB} + e_B \xi - \beta \theta - P_{bB} - t_b (1 - x^*) \\ \lambda n_{bA} + e_A \xi - P_{sA} - t_s y^* &= \lambda n_{bB} + e_B \xi - P_{sB} - t_s (1 - y^*)\end{aligned}$$

- Utility indifference points x^* and y^* for consumers and merchant users:

$$\begin{aligned}x^* &= \frac{1}{2} + \frac{\lambda(n_{sA} - n_{sB}) + \xi(e_A - e_B) - (P_{bA} - P_{bB})}{2t_b} \\ y^* &= \frac{1}{2} + \frac{\lambda(n_{bA} - n_{bB}) + \xi(e_A - e_B) - (P_{sA} - P_{sB})}{2t_s}\end{aligned}$$

- Combined with $n_{bA} = x^*$, $n_{bB} = 1 - x^*$, $n_{sA} = y^*$, $n_{sB} = 1 - y^*$, We can obtain the equation of two-sided user scale on social e-commerce platform and two platform profit with respect to price. n_{si} , n_{bi} ($i = A, B$), π_A , π_B

2.2.2 Two-sided Market Pricing



Partial Derivatives

First-order partial derivatives with respect to $P_{sA}, P_{bA}, P_{sB}, P_{bB}$:

$$\frac{\partial \pi_A}{\partial P_{sA}} = 0, \frac{\partial \pi_A}{\partial P_{bA}} = 0$$
$$\frac{\partial \pi_B}{\partial P_{bB}} = 0, \frac{\partial \pi_B}{\partial P_{sB}} = 0$$

Setting the partial derivatives to zero yields the optimal pricing for consumer membership fees and merchant marketing service fees:

$$P_{bA}^* = \frac{\xi}{3}(e_A - e_B) + (t_b - \lambda) \quad P_{sA}^* = \frac{\xi}{3}(e_A - e_B) + (t_s - \lambda)$$
$$P_{bB}^* = \frac{\xi}{3}(e_B - e_A) + (t_b - \lambda) \quad P_{sB}^* = \frac{\xi}{3}(e_B - e_A) + (t_s - \lambda)$$

Finally, the user scale and profits of social e-commerce platforms A and B can be obtained:

$$n_{bA}^*, \quad n_{bB}^*, \quad n_{sA}^*, \quad n_{sB}^*; \quad \pi_A^*, \quad \pi_B^*$$

2.2.2 Two-sided Market Pricing



Profit Difference Analysis

$$\Delta\pi = \pi_A - \pi_B = \frac{(e_A - e_B)}{6} [8\xi - 3k(e_A + e_B)] = \frac{1}{6} \Delta e [8\xi - 3k(\Delta e + 2e_B)]$$

$$\frac{\partial^2 \pi_1}{\partial \Delta e^2} = -k < 0$$

$$\frac{\partial \pi_1}{\partial \Delta e} = \frac{4\xi}{3} - k(\Delta e + e_B) = 0, \quad \Delta e = \frac{4\xi}{3k} - e_B$$

- when $\Delta e < \frac{4\xi}{3k} - e_B$, the profit difference of social e-commerce platforms increases with an increase in marketing service levels.
- when $\frac{4\xi}{3k} - e_B < \Delta e$, the profit difference decreases with further increases in marketing service levels.

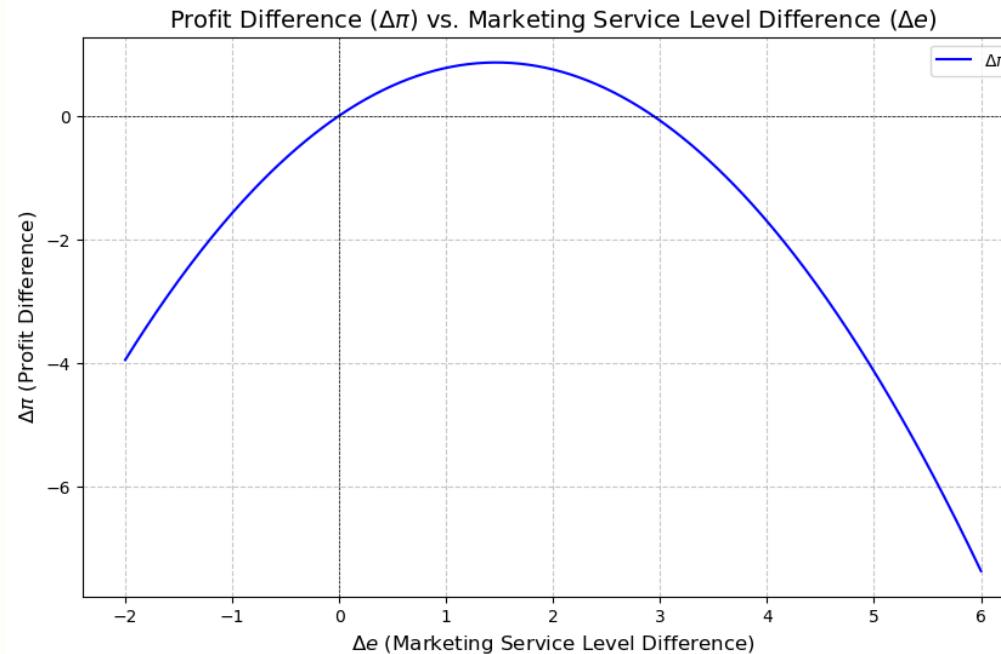
2.2.2 Two-sided Market Pricing



Profit Difference Analysis

set $\xi = 1, e_B = 0.4, k = 0.4$, plot the graph:

- With Social Interaction、Promotional Activities 、Precision Marketing、User Data Utilization, these strategies raise Pinduoduo's marketing service level e_A , keeping the difference from competitors Δe within an optimal range.
- When Δe is below a critical value, $\Delta\pi$ increases with Δe . By maintaining Δe in this optimal range, Pinduoduo maximizes its profit difference and outperforms competitors.



2.3.1 Mechanism of the online reputation system

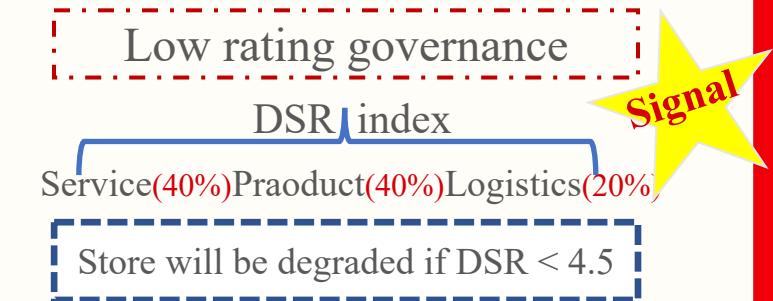
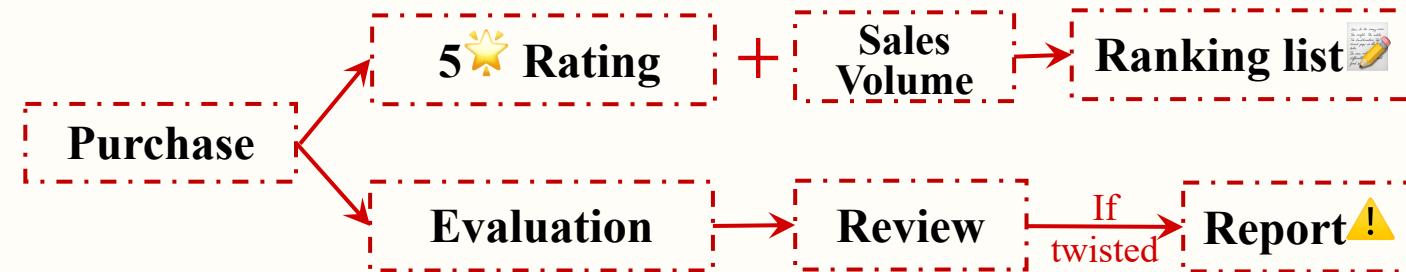


Mechanism

Buyer

Seller

Platform

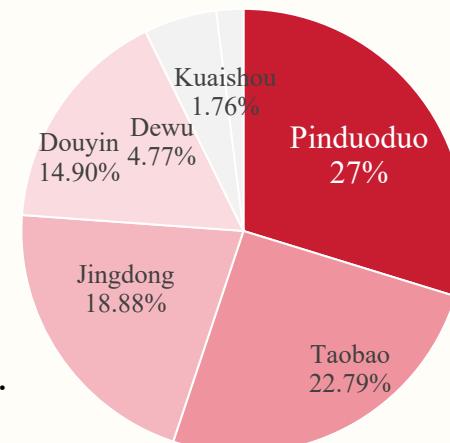


BUT !

FAKE

Complaint rate of
Pinduoduo is the **highest**.

Head e-commerce complaint rate



WHY?



Price war: Low-price strategy attracts counterfeit goods.
Platform squeezes merchants: High algorithm and advertising costs.
Difficulty in regulation: Huge data & dispersed merchants.

2.3.2 Risk of online reputation system



Problem

Seller: counterfeit products

- Adverse selection: Low-quality products squeeze out high-quality.
- Rich fake range: Fakes cover clothing, electronic appliances and many other categories.
- Weak brand concept: platform focuses more on goods.



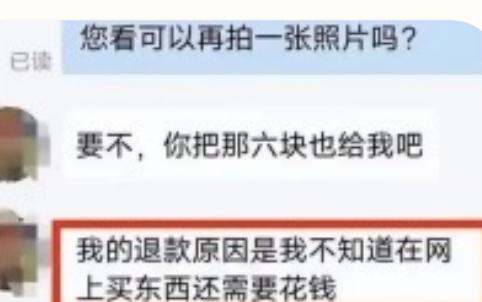
Solution

“New brand plan2.0” + “Billion subsidy”

- Support sub-brands of well-known brands, boost new industrial belt brands, and revitalize old domestic brands.
- Billion Subsidy focuses on digital 3C, offering the lowest prices and authentic reputation.



Buyer: "Refund only" policy



Moral hazard: Buyer can buy products impulsively given the customer-oriented policy.

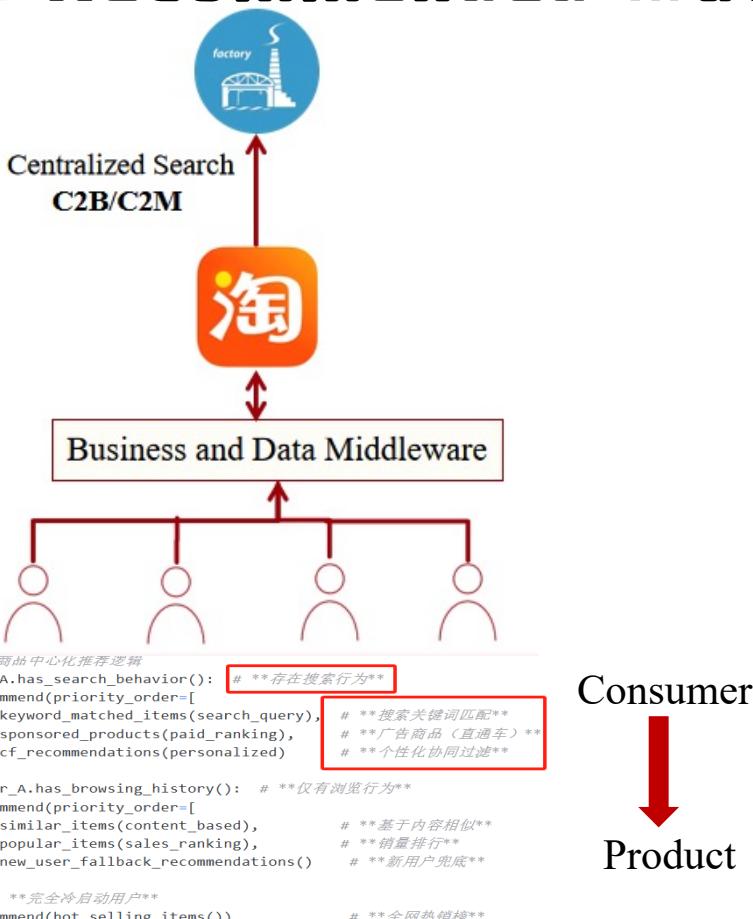
“Selected user plan”

- Consumer filtering: Eliminate low-quality consumers who engage in wool-harvesting (薅羊毛).
- Official policy: State Administration for Market Regulation has urged platform to avoid squeezing merchants.

拼多多内测新功能：商家退货包运费标识可以仅部分用户可见

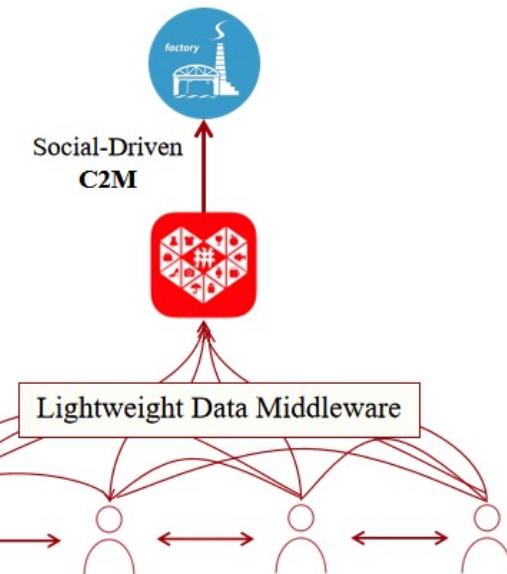


2.4.1 Recommended Matching System



Taobao

- Mechanism: A buy X, B buy X+Y, recommend Y to A
- Collaborative Filtering: only based on behavioral similarities
- Data: Inability to obtain real social relationships



PDD

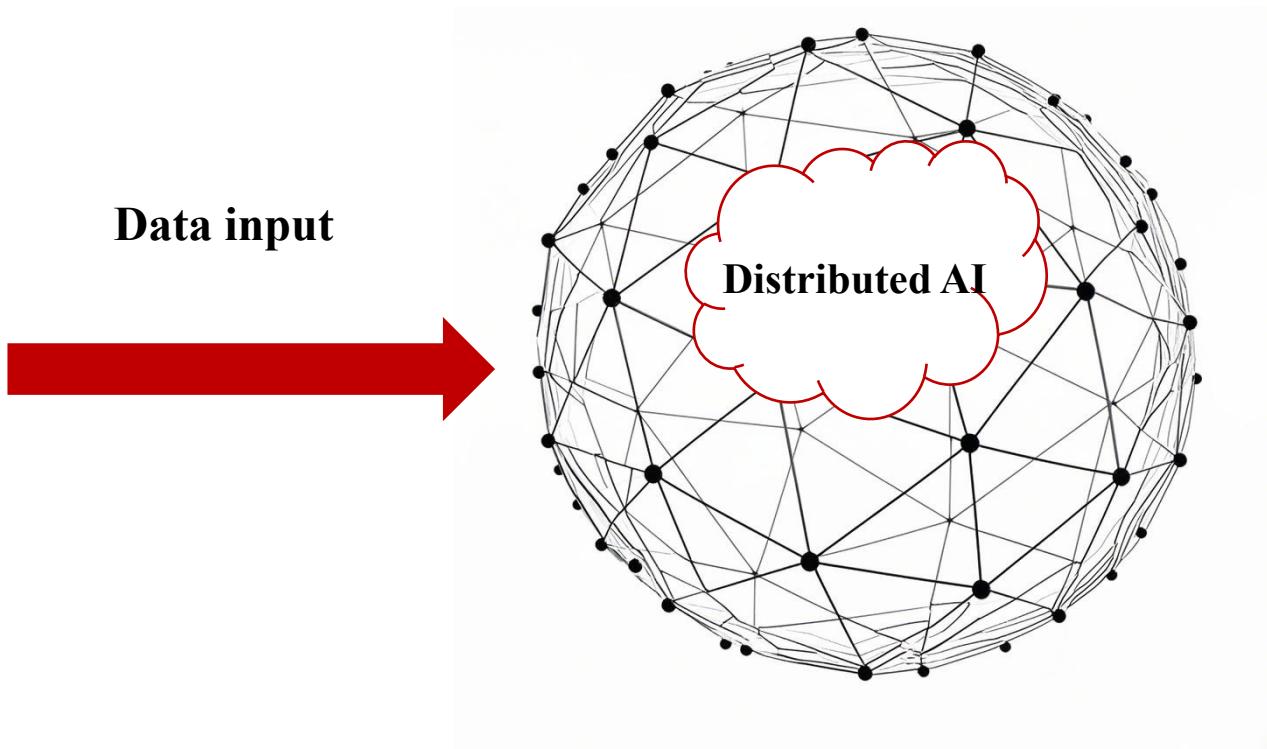
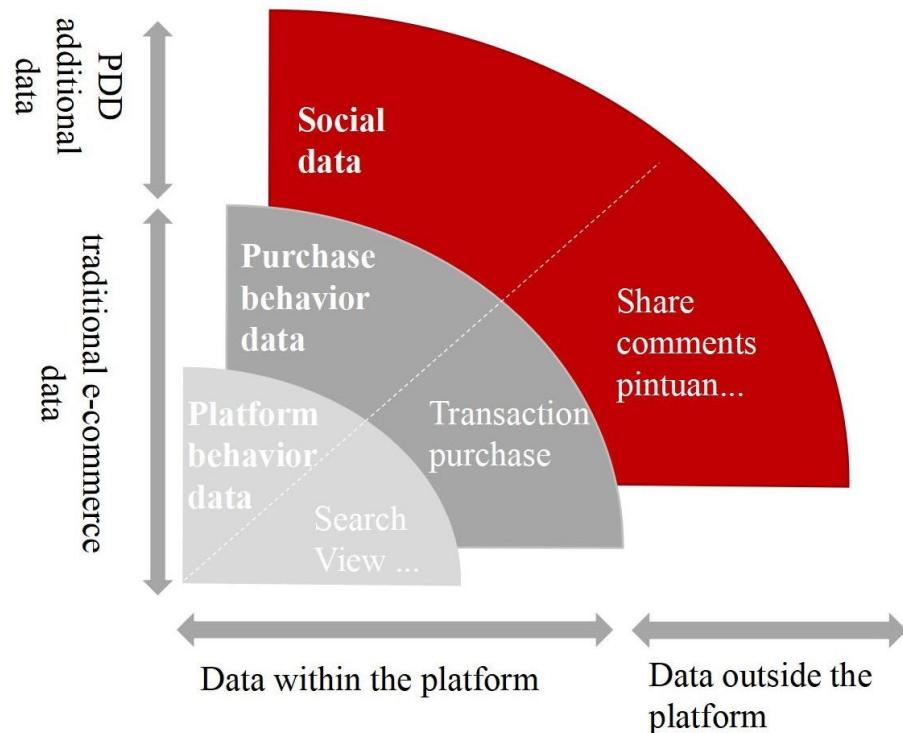
- Mechanism: A views X, B's pintuan includes X+Y → Push Y to A with discount + peer pressure
- Collaborative Filtering (More Social influence weight) **Better!**
- Data: Social weight + Penetration rate across different social strata



PDD do better at cold start, data, and user group target...



2.4.2 Algorithm differences



1. **Taobao**: Platform **centralization algorithm**, focus on **products** to Collect, calculate, and distribute data.
2. **PDD**: **people-oriented** algorithm, use distributed AI can deeply **understand users** and enhance the algorithm by utilizing **pintuan data and social relationships**.

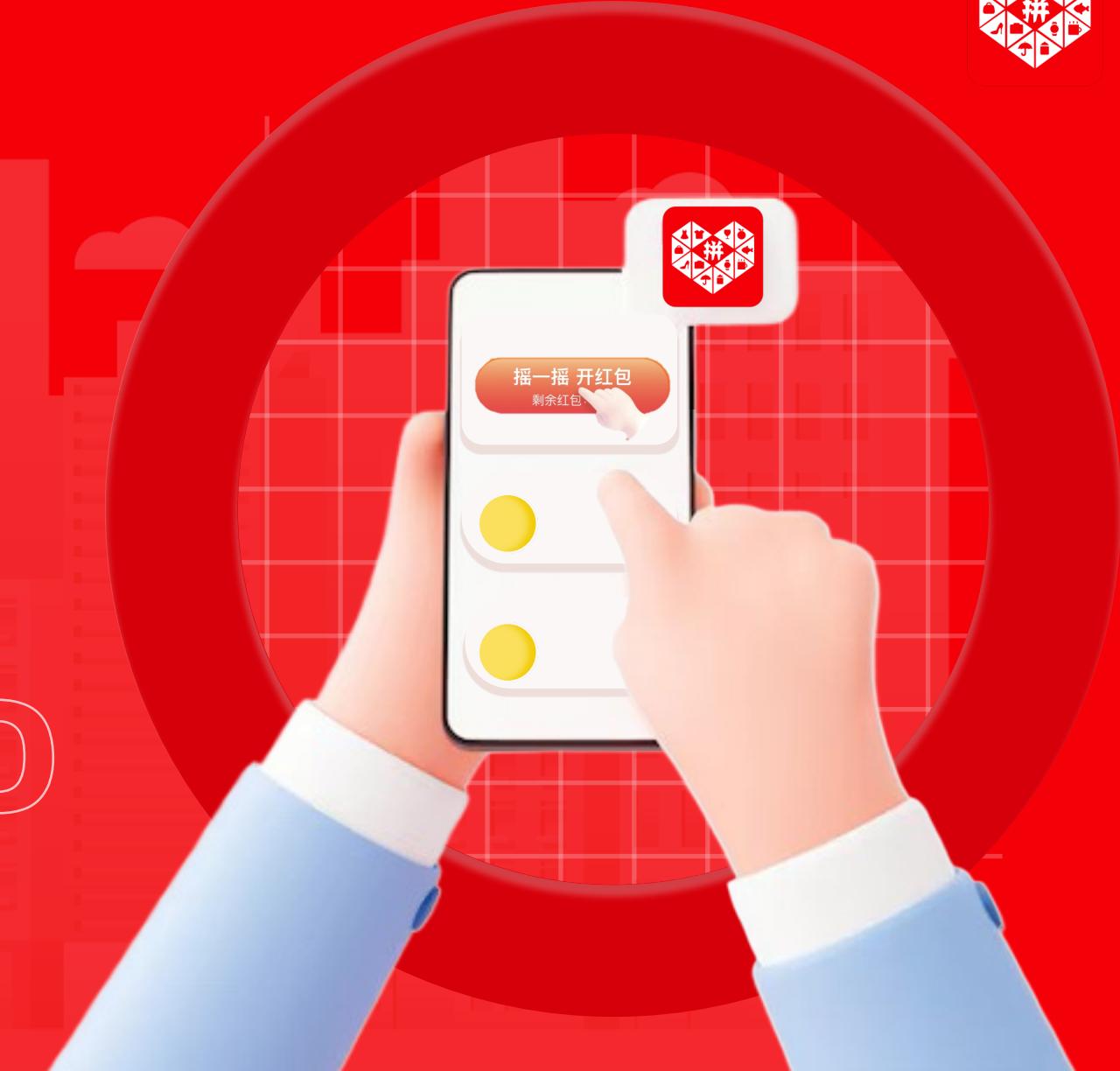




PART 03

Extension

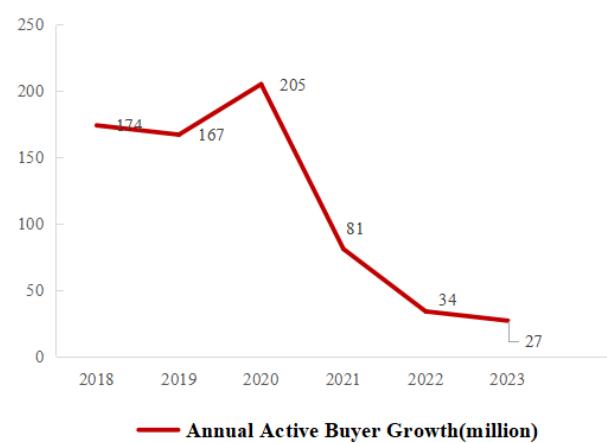
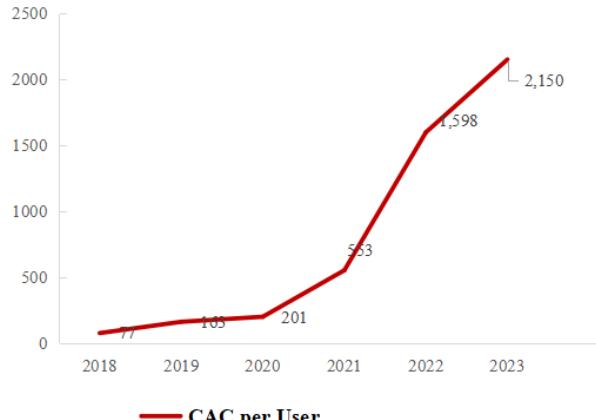
PINDUODUO



Team Up, Price Down!

Team Up for Savings | Deals | Welcome Surprises !

3.1 Can PDD's path to success be replicated ? Difficult!



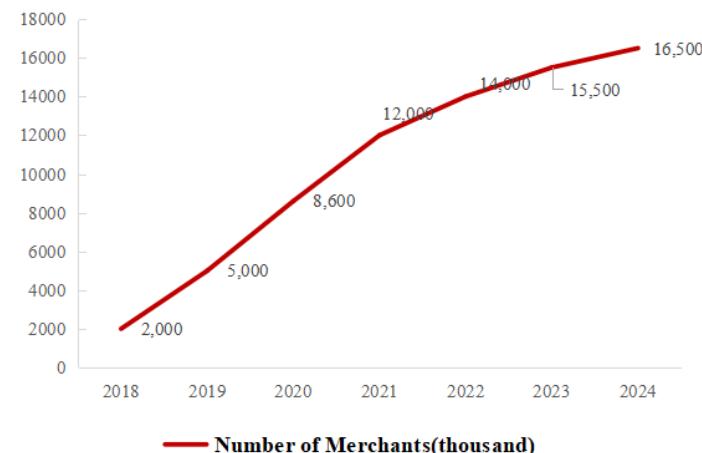
1. Social Media Dividend Depletion:



User virality willingness declined.

2. Public Traffic Ceiling:

Short videos now account for 70% of user screen time (Before < 15%).



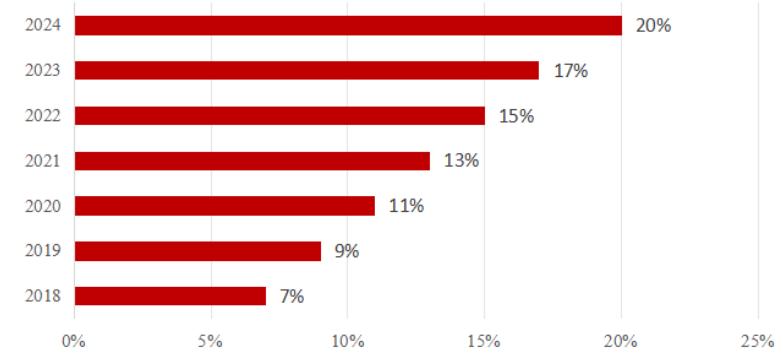
1. Industrial Cluster Saturation:



16.5 million merchants , profit margins < 5%.

2. Strengthened Quality Oversight:

Regulations require platforms to conduct sampling **inspections** on **50%** of products.



1. Downstream Market:



Highly price-sensitive but demands quality upgrades.

2. Mid-to-High-End Market:

Rejects "low price, low quality", pay for trust

3.2 What is the future direction of POD ?



Core problem: growth break

Inbalance of bilateral market

1. Demand side

Price Anchoring

2. Supply side

Prisoner's Dilemma

3. Platform side

Inbalance of pricing structure



Attenuation of network effect

User growth

Merchant retention



Failure of ecological governance

Quality dispute

Doubts about fakes undermine the platform's credibility.

Policy risk

Conflict btw nature of public goods & private interests.

Breakthrough: triple equilibrium



Reconstruction of price equilibrium



Price Discrimination

- Sinking market: Keep prices under 50 & quality grading label.
- Mid-to-high-end market: Create a "quality zone" where merchants can charge 30% more.



Upscale of quality equilibrium



Signaling Theory

- C2M 2.0: Set up a Quality Co-research Fund to subsidize merchants.
- Elimination Mechanism: Charge a quality deposit for merchants with a return rate exceeding 15%, compelling supply chain upgrades.



Optimization of governance equilibrium



Polycentric Governance

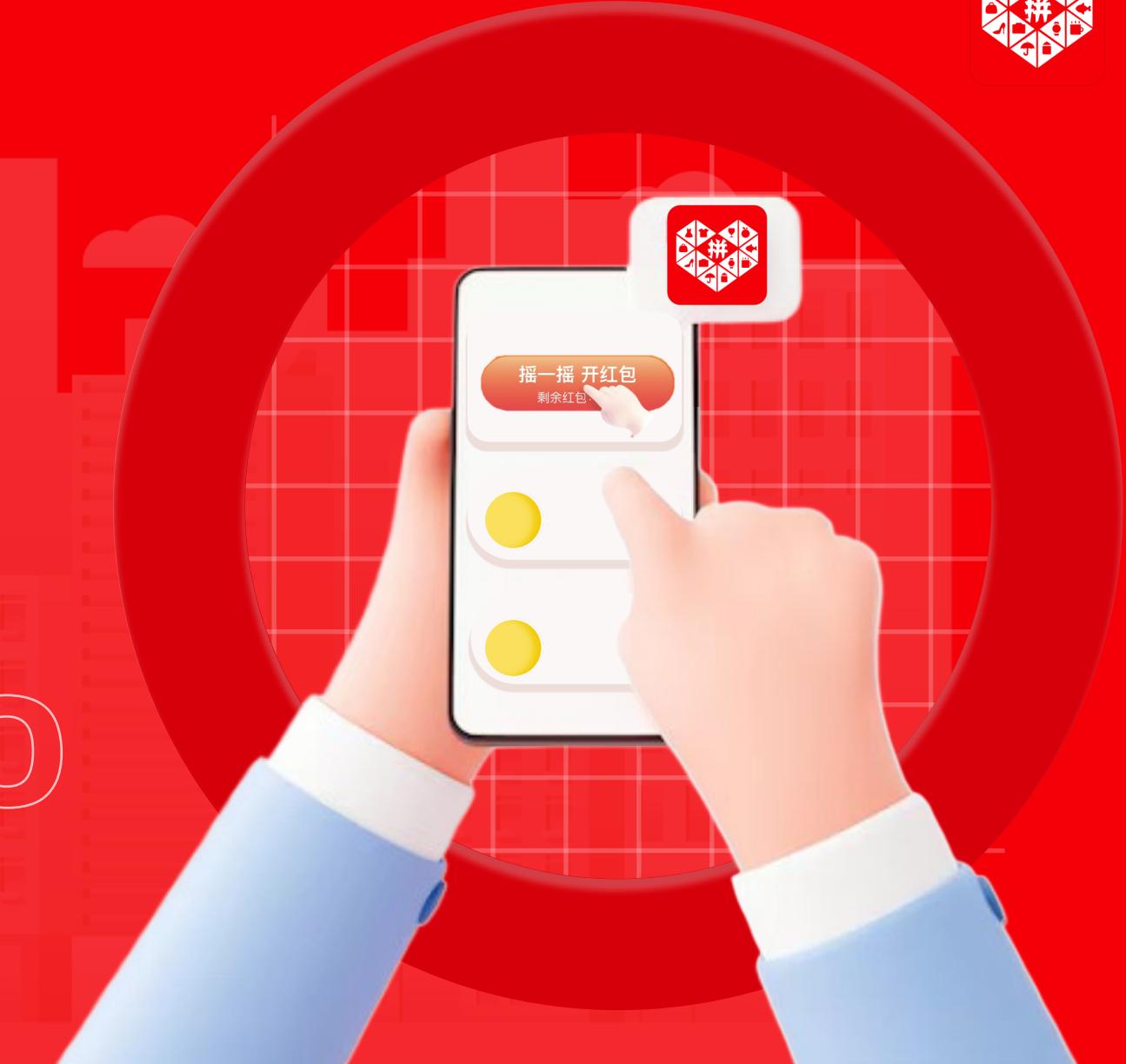
- Merchant co-governance Committee: Invite TOP50 merchants to participate in the rule-making and voting.
- Consumer empowerment: Launch Quality Crowdfunding where users can advance funds in product design.



PART 04

Conclusion

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4. Conclusion



Why Did PDD Take Off ?

1. Network Effect

Direct & Indirect Network Effects Cycle

2. Platform Pricing

C2M model

3. Online Reputation

“New brand plan2.0” + “Billion subsidy”

4. Recommendation System

Associate with the social data

Theoretical Analysis

How does PDD deal with the problem of fakes ? (see the online reputation system)

Extension

Can PDD’s path to success be replicated ? No !

What is the future direction of PDD ? Pricing, Quality and Governance Combination.



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Thank You

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Team Up, Price Down!

Team Up for Savings | Deals | Welcome Surprises !

