

# PINDUODUO

*Why Did PDD Take Off ?*

*— A platform economics-based perspective.*

April 18<sup>th</sup>, 2025

Group 1: Kai Ren, PeiHua Ji, JunWen Luo, FeiFan Xu,  
Lei Cheng, Chang Li

Team Up, Price Down!

Team Up for Savings | Deals | Welcome Surprises !





# PINDUODUO

**PART 01**

*Platform  
Introduction*

**PART 03**

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**PART 02**

*Theoretical  
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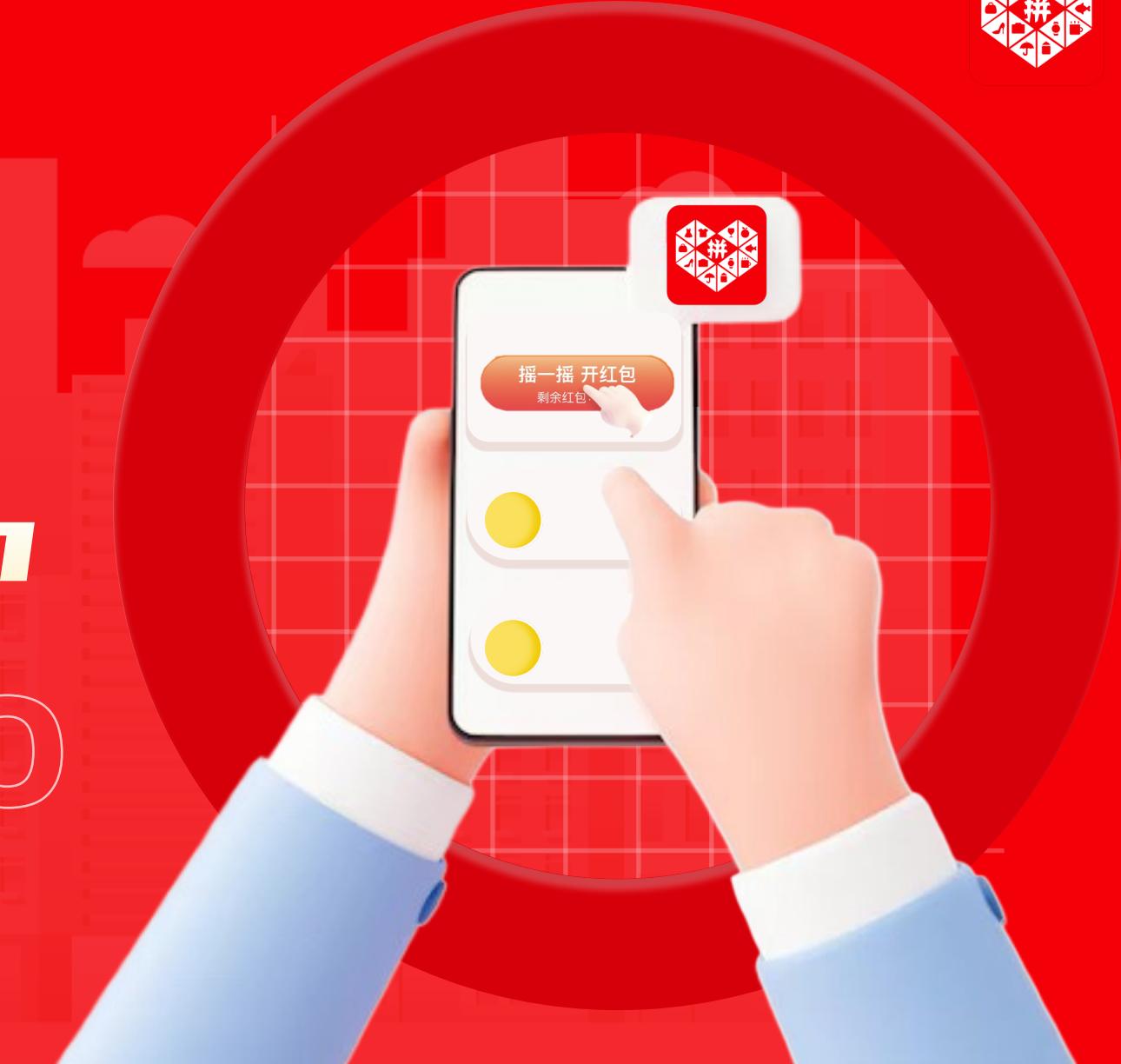




## PART 01 *Platform*

### *Introduction*

# PINDUODUO



# 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 !

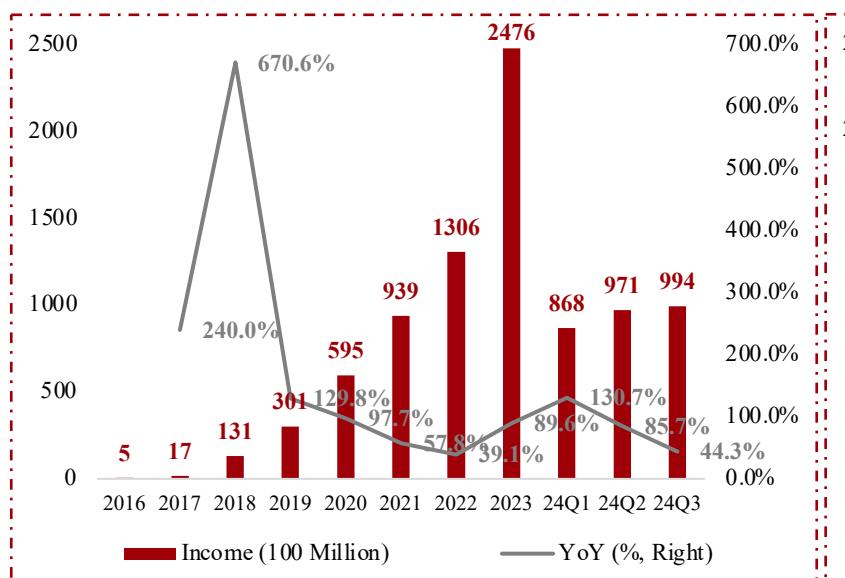


Fig 1.1 PDD Revenue and Growth Rate  
(2016 – 2022 Q3)

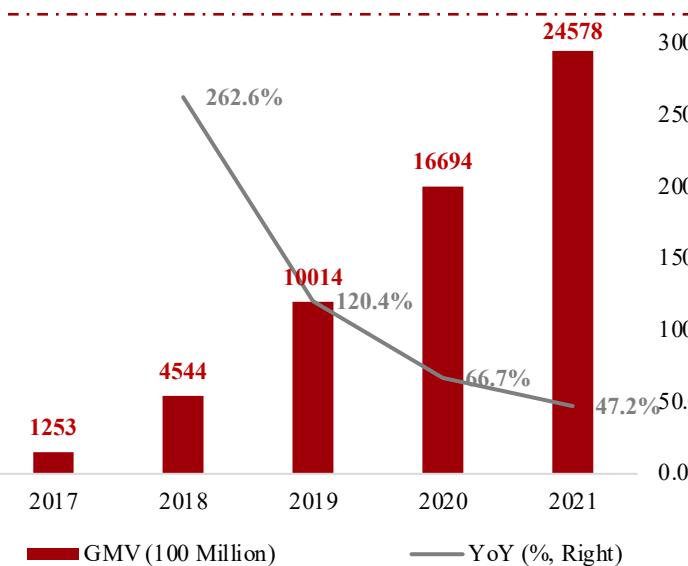


Fig 1.2 PDD GMV and Growth Rate  
(2017 – 2021)

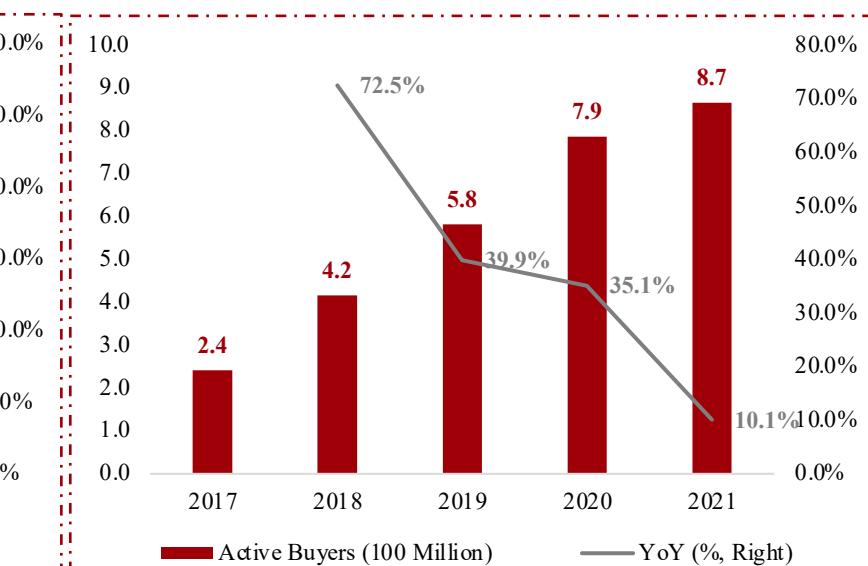


Fig 1.3 PDD Active Buyer and Growth Rate  
(2017 – 2021)

# 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

The screenshots illustrate various recommendation features:

- Top Left:** A banner for "Government Subsidy" with a 80% discount offer. It includes sections for "Draw Prizes", "Government Subsidy", and "Everyone's Subsidy".
- Middle Left:** A "多人团" (Multi-person group) section showing deals like "New Huihua ad calcium" for 27, "Lilyan 5-layer toilet paper" for 31.9, and "Xinjiang Anjia butter" for 75.6.
- Bottom Left:** A "限时利杀" (Limited-time Kill) section for "万人团" (Ten-thousand person group) showing items like a t-shirt for 35.91 and a whole box of bread for 7.91.

## 2. Platform Pricing

This screenshot shows a product search result for a "HP Pavilion Gaming Thin & Light laptop". Key features highlighted include:

- 推荐 (Recommendation)
- 电脑 (Computer)
- 食品 (Food)
- 电器 (Appliances)
- 手机 (Mobile Phone)
- 男装 (Men's Clothing)
- 百货 (General Merchandise)

A red arrow points from the "多人团" section of the previous screenshot to this search result.

This screenshot shows the "拼小圈" (Pindao) feature. It displays a friend's post: "Gongxi Fa Cai, Da Jia Da Li" (Happy New Year, Everyone). It also shows a "红包" (Red Envelope) section and a "添加好友" (Add Friend) button.

Circle of Friends in PDD to build friendships.

## Invite Friends for Cash

A message from user "Khf/竹简" inviting friends to earn money. It includes a QR code and the text: "Khf/竹简我把祝福连一连, 愿你好运连连财气多, 福气连连幸运多, 喜气连连顺心多, 快乐连连欢乐多, 祝福连连友谊多" and a code "7-8b5".

## 1. Network Effect

A promotional banner for a "整箱12个" (Full box of 12) of "养胃苏打" (Gastritis-relieving Soda) bread. It highlights a price drop from 7.9 to 5.94.

## 优质服务保障

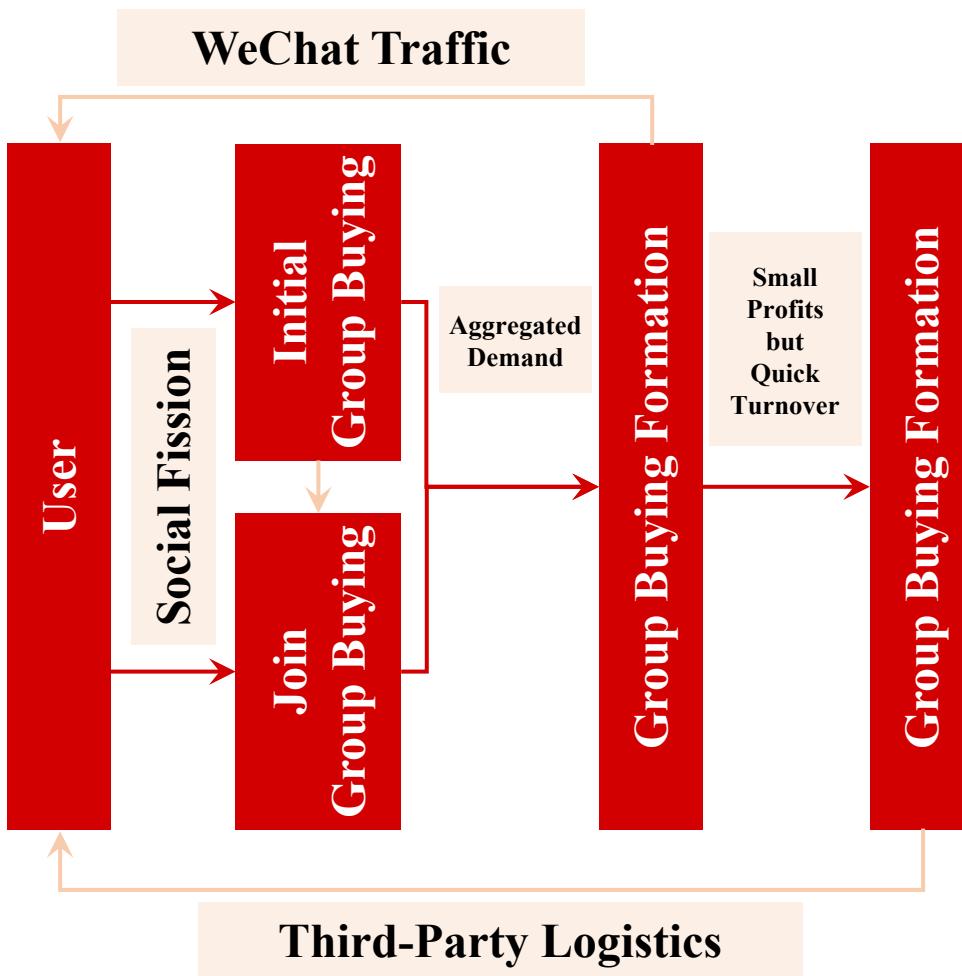
A store profile for "轻灵服装专营店" (Qingling Clothing Special Shop) with a 5-star rating. It highlights "正品保障 买贵双倍赔" (Authentic Product Assurance, Double Compensation for Price Difference) and "假一赔十" (Fake One, Compensate Ten).

## 3. Online Reputation

# 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 ?*

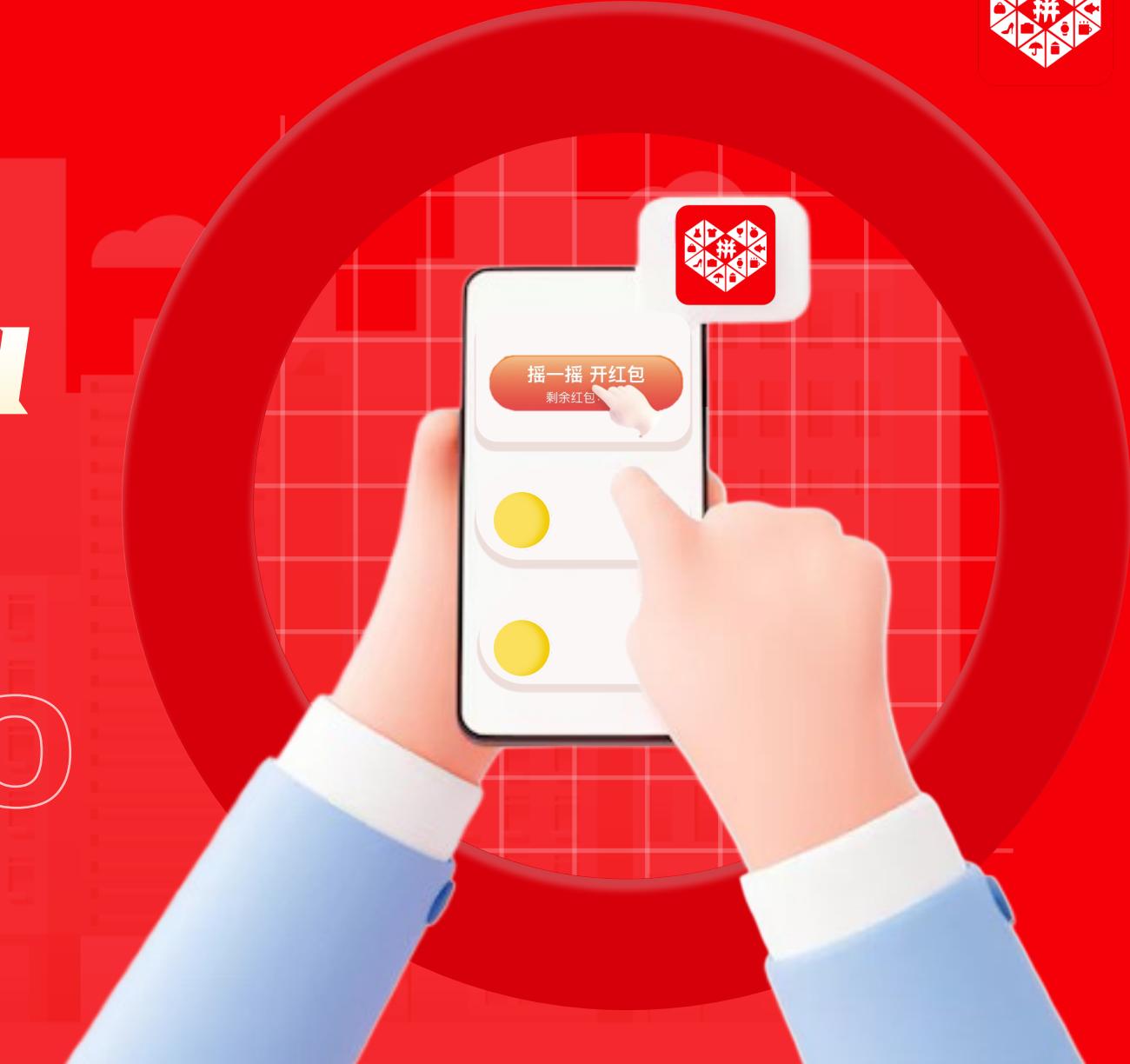
**Conclusion**



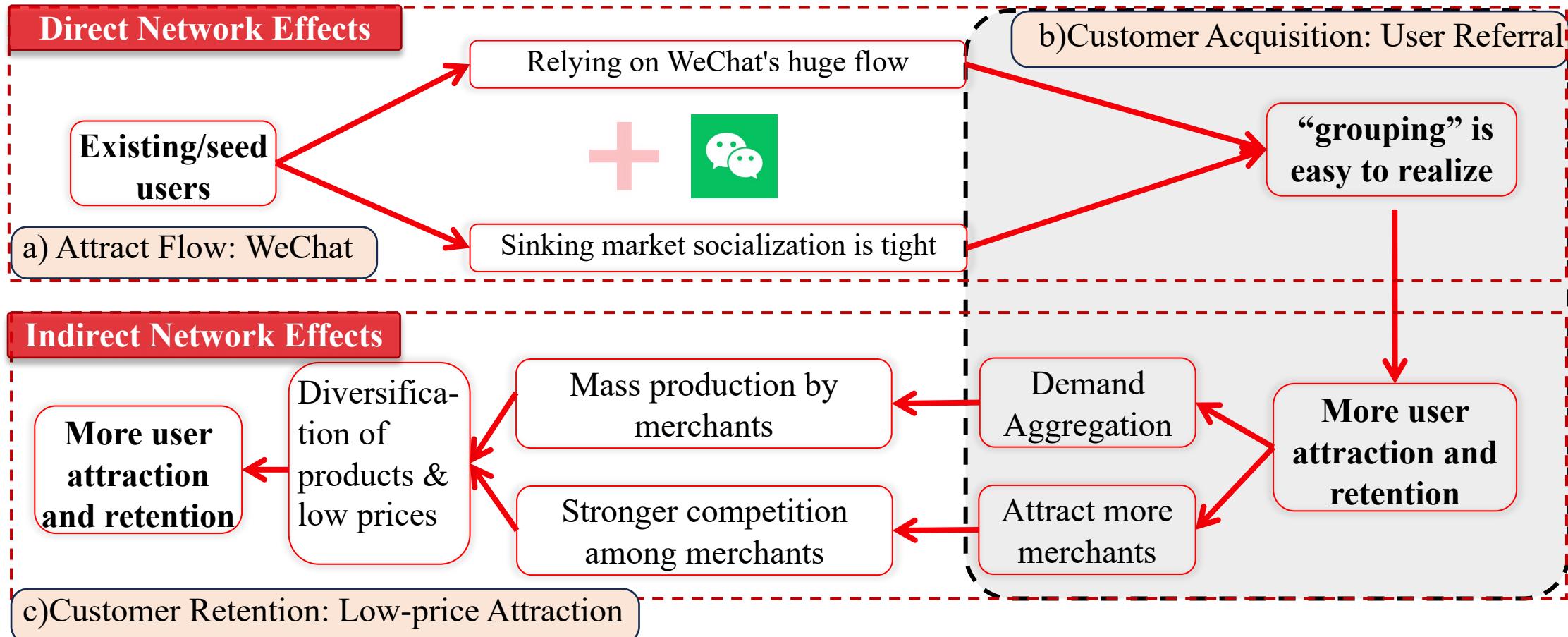
## PART 02

# 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

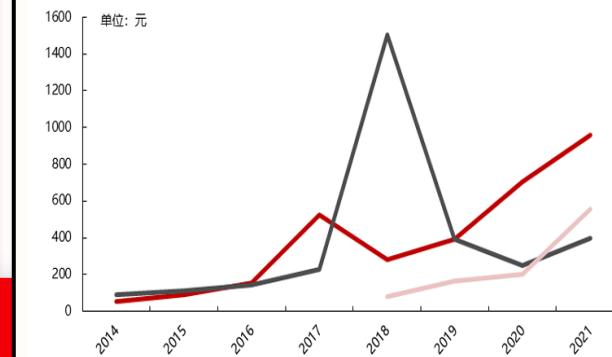
Viruses-Like Spreading Model

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

### Low CAC 04

Of PDD

— 阿里 — 京东 — 拼多多

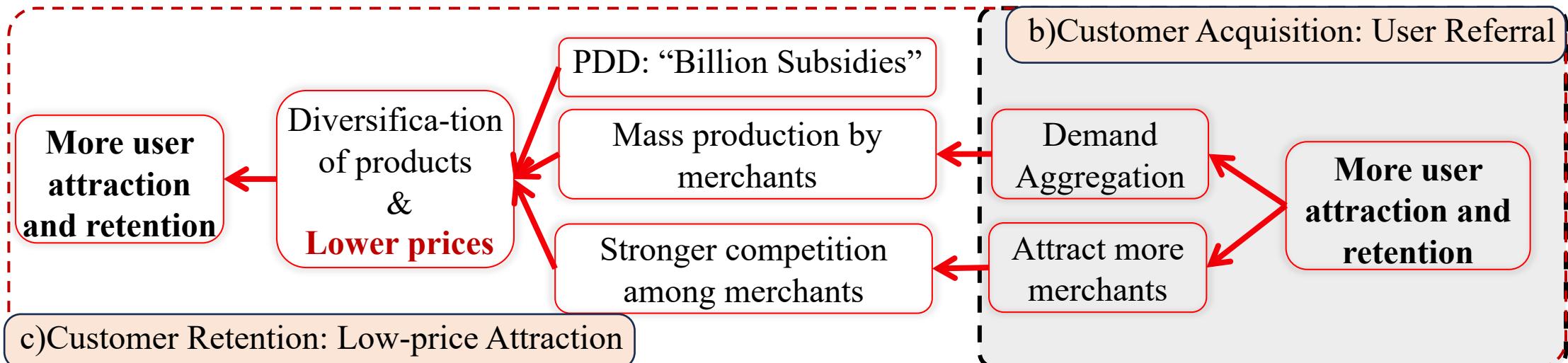


Purpose —— Reducing Customer Acquisition Cost (CAC).

## 2.1.3 Indirect Network Effects



### PROCESS



### Benefits

Of indirect network effects

#### Merchant Side

Attracting Merchants

#### User Side

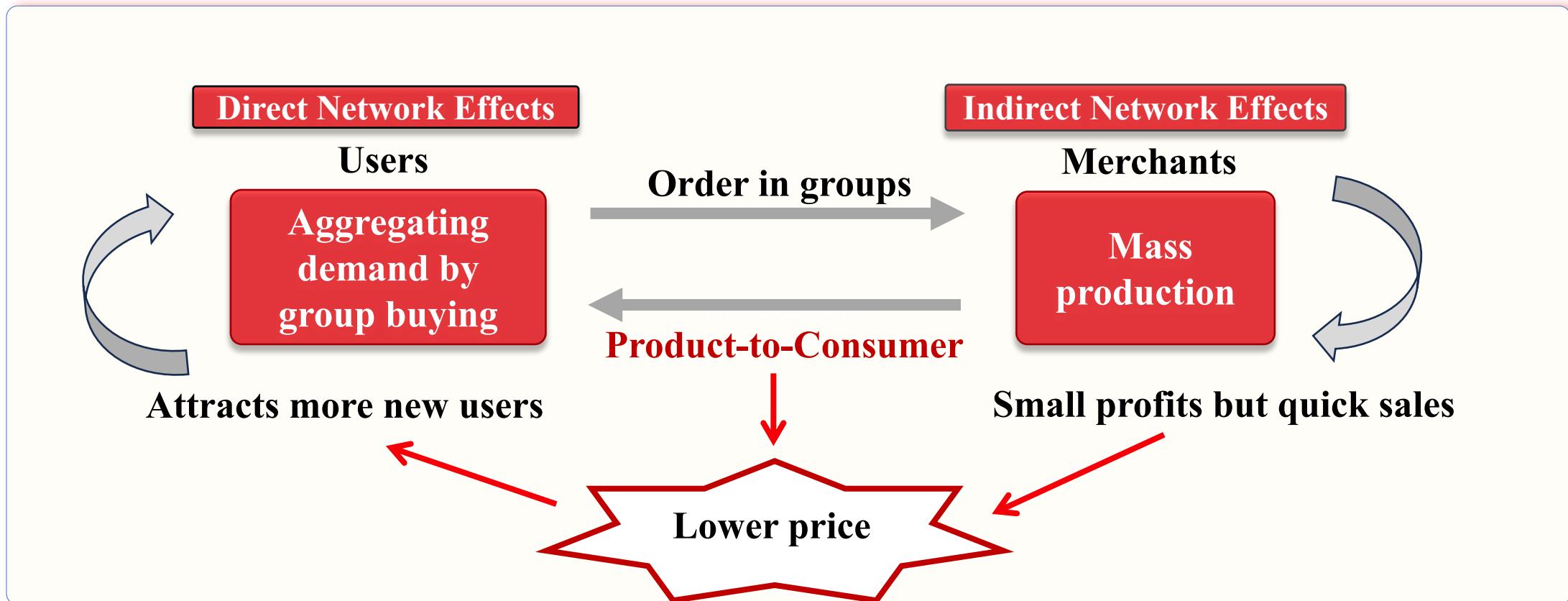
Increase in User Benefits



## 2.1.4 Result of direct & indirect network effect



### Network Effects Cycle



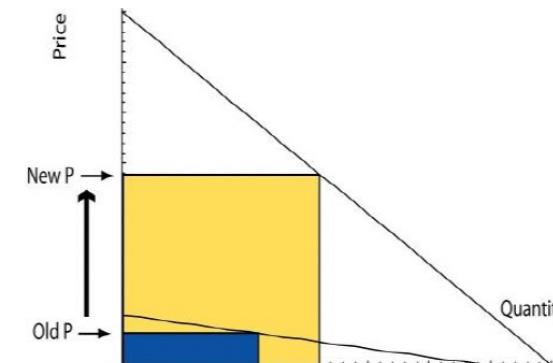
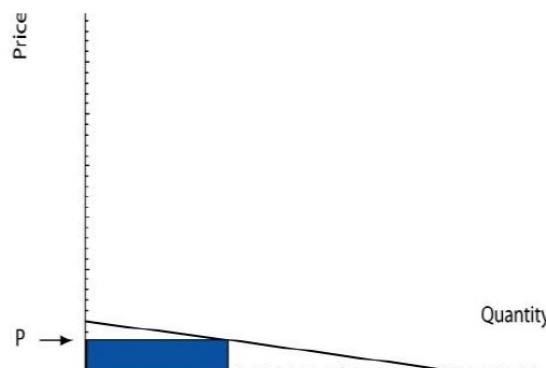
## 2.2.1 Divide-and-conquer strategy



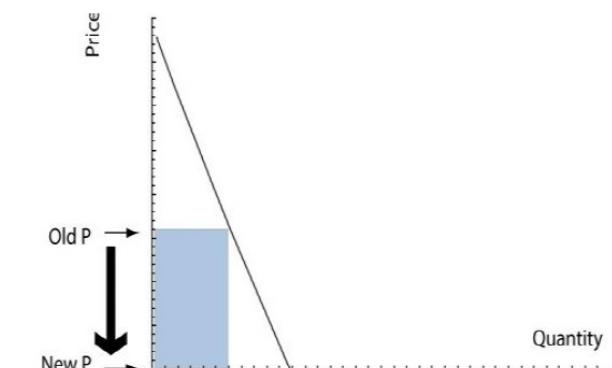
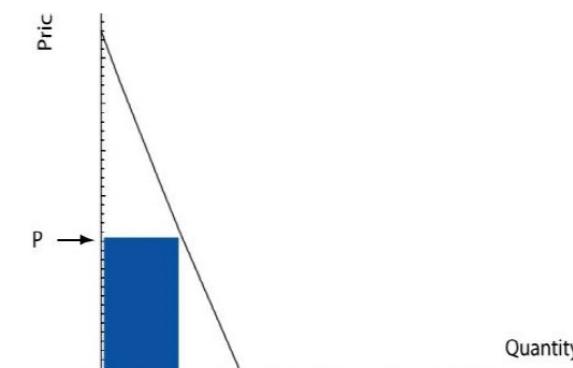
PDD dominates China's e-commerce through social group buying and direct factory sales. By cutting middlemen and using WeChat's network, it delivers ultra-low prices to cost-conscious shoppers nationwide. Its C2M model and gamified promotions make online shopping affordable across all city tiers.

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

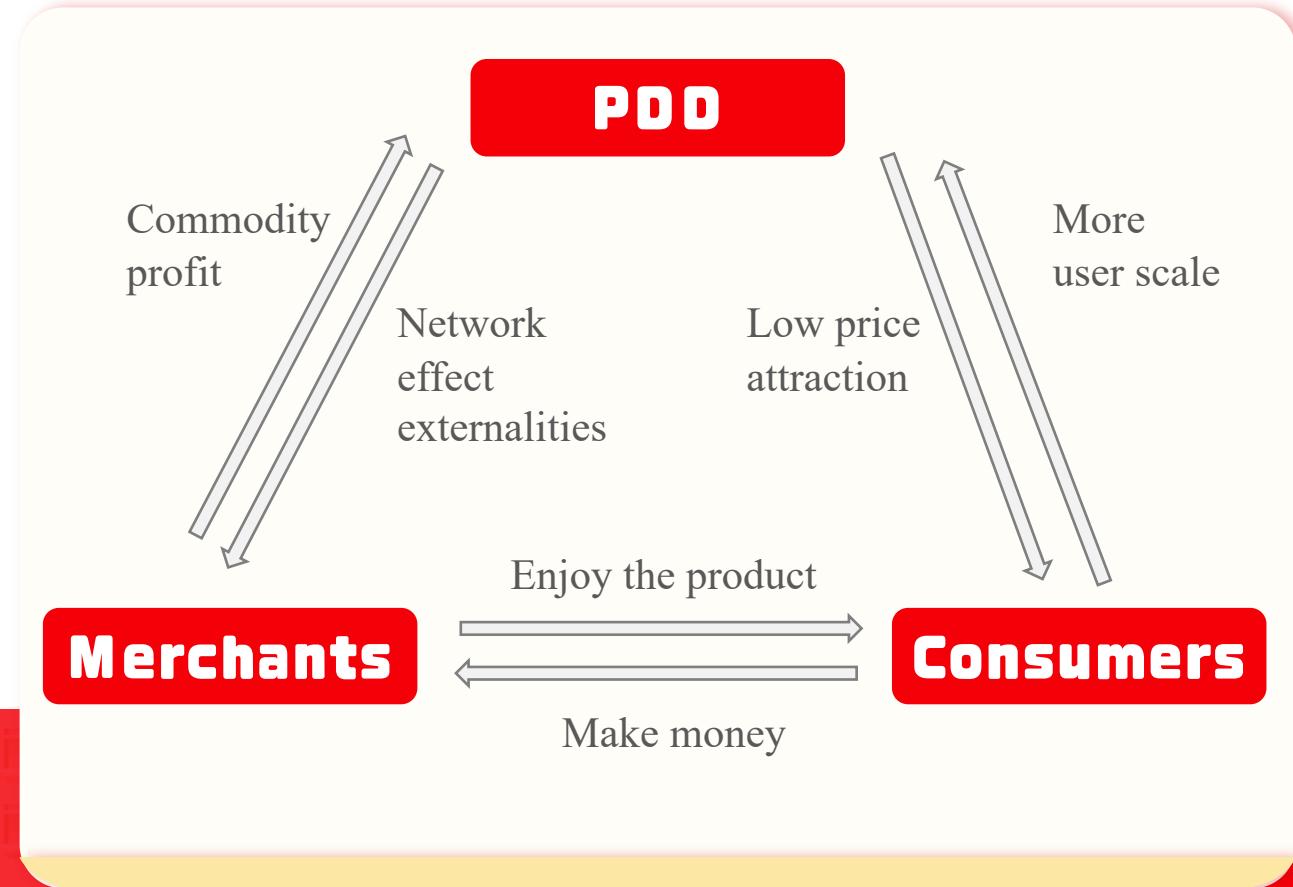
#### Viral Discounts & “Lowest Price” Branding

- ❖ **“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.
- $\lambda$ : 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

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

- $\lambda n_{si}$ : 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

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

- $\lambda n_{bi}$ : 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.  $n_{si}$ ,  $n_{bi}$  ( $i = A, B$ ),  $\pi_A$ ,  $\pi_B$

## 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.

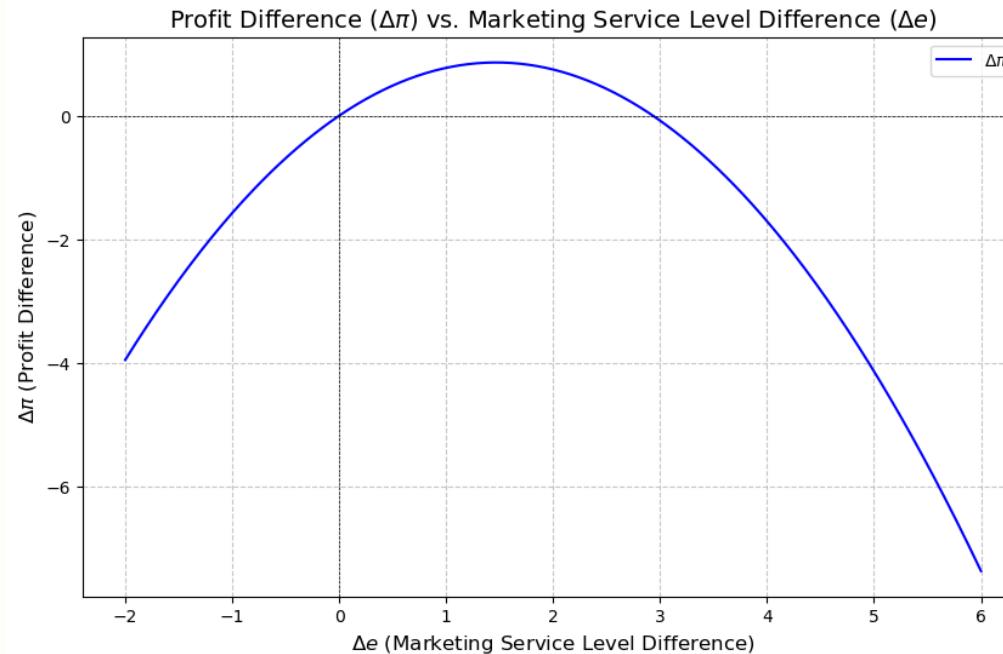
## 2.2.2 Two-sided Market Pricing



### 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  $\Delta e$  within an optimal range.
- When  $\Delta e$  is below a critical value,  $\Delta\pi$  increases with  $\Delta e$ . By maintaining  $\Delta e$  in this optimal range, Pinduoduo maximizes its profit difference and outperforms competitors.



## 2.3.1 Mechanism of the online reputation system

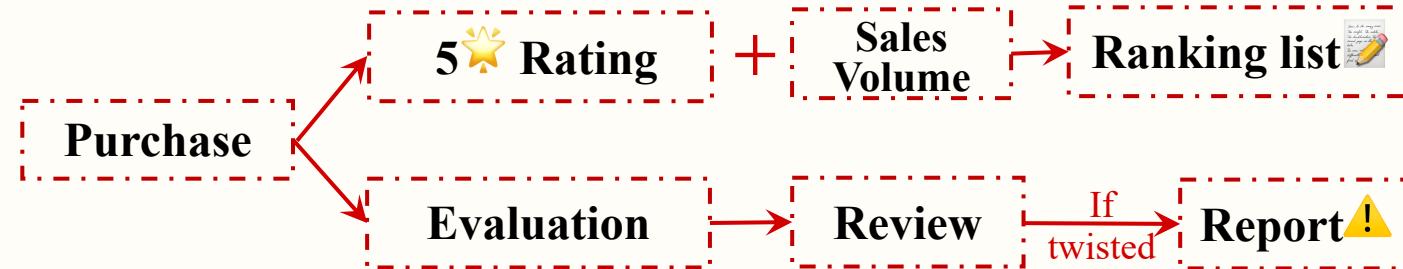


Mechanism

Buyer

Seller

Platform

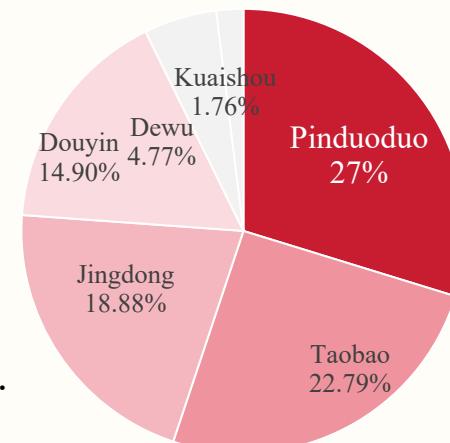


BUT !

**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

已读 您看可以再拍一张照片吗？

要不，你把那六块也给我吧

我的退款原因是我不知道在网上买东西还需要花钱

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

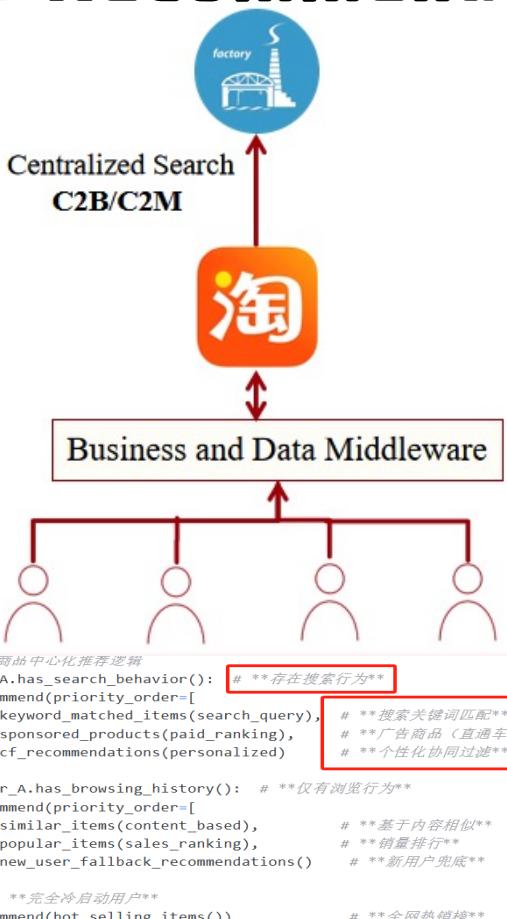
#### “Selected user plan”

- 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.

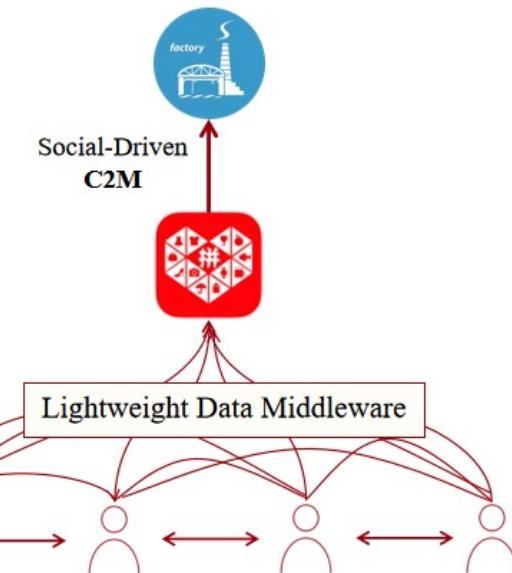
拼多多内测新功能：商家退货包运费标识可以仅部分用户可见



## 2.4.1 Recommended System



Content-based Filtering  
+Collaborative Filtering



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



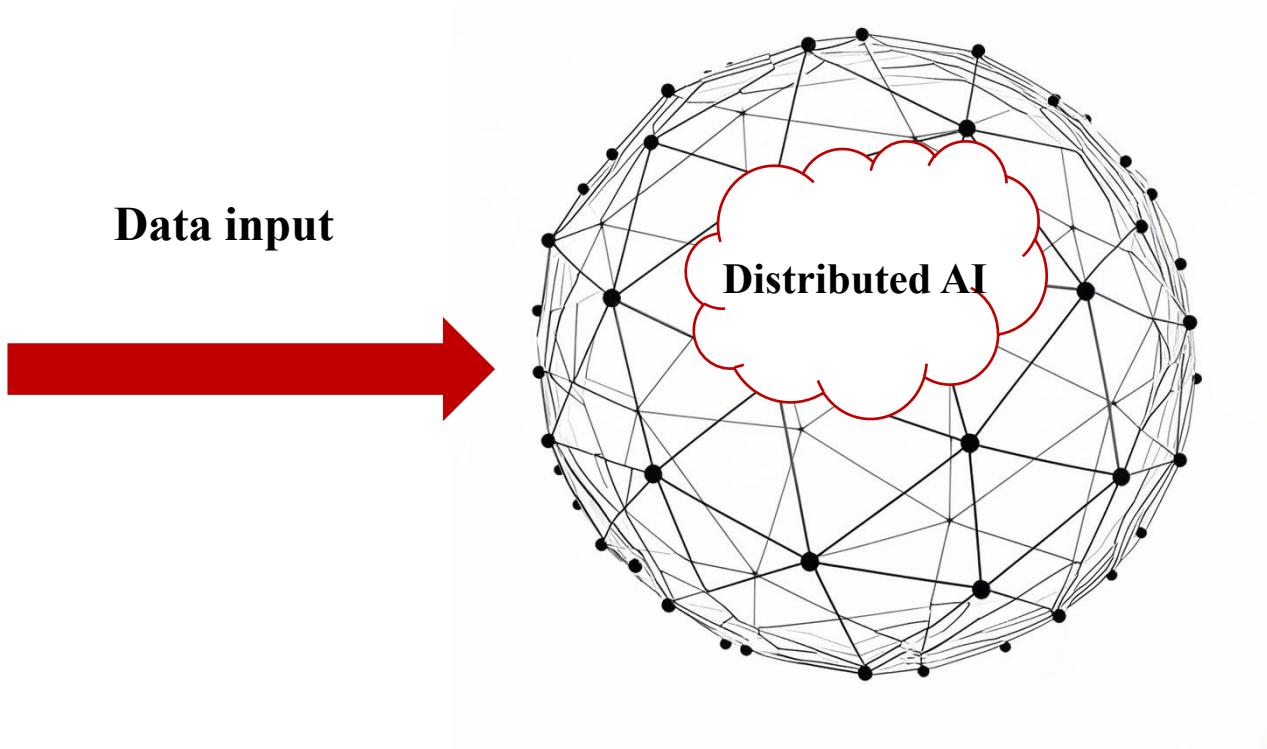
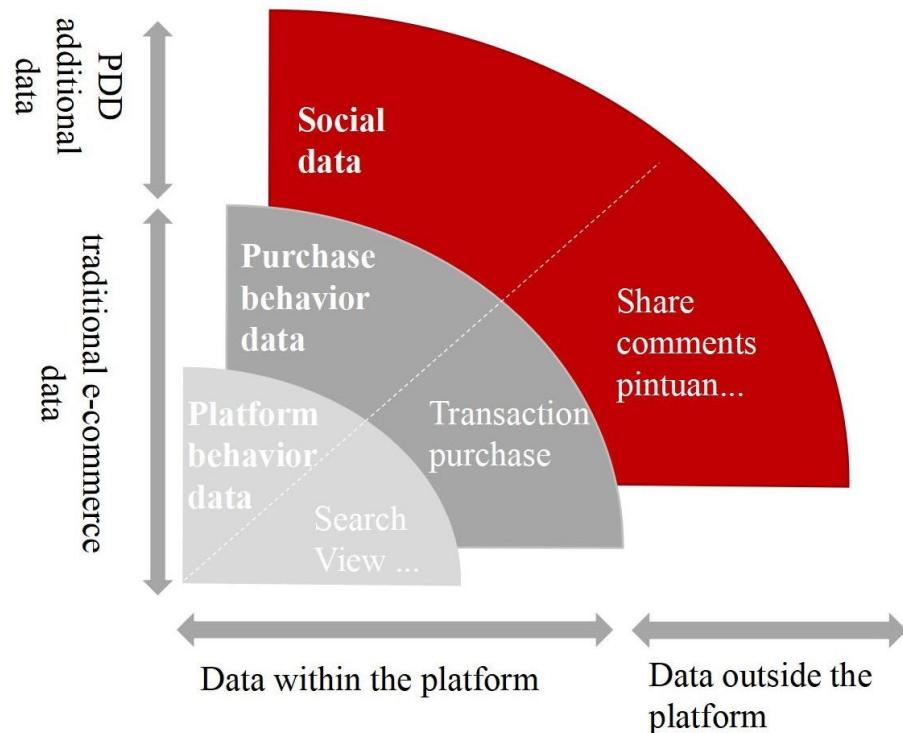
PDD

- 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**.

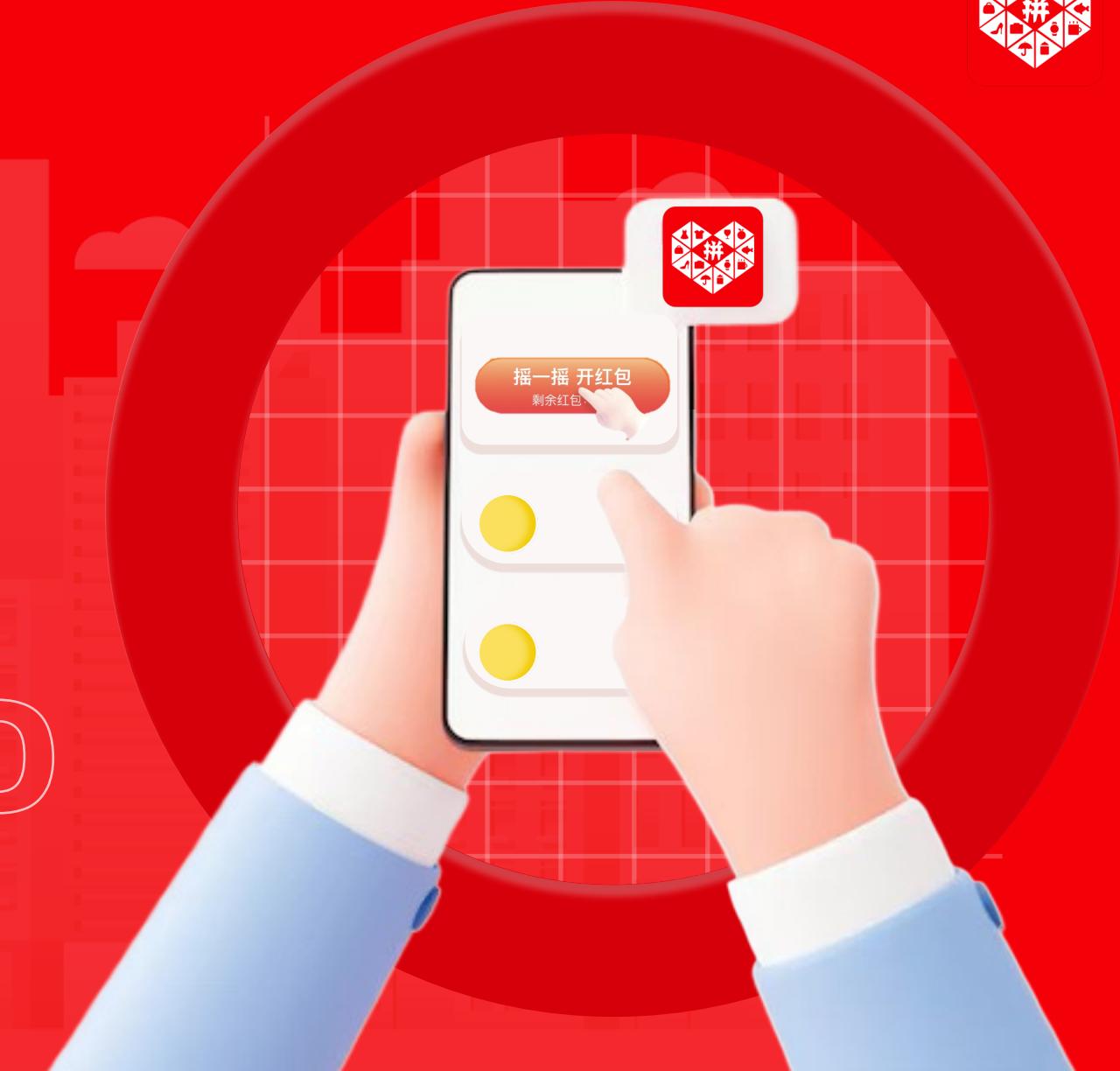




PART 03

## Extension

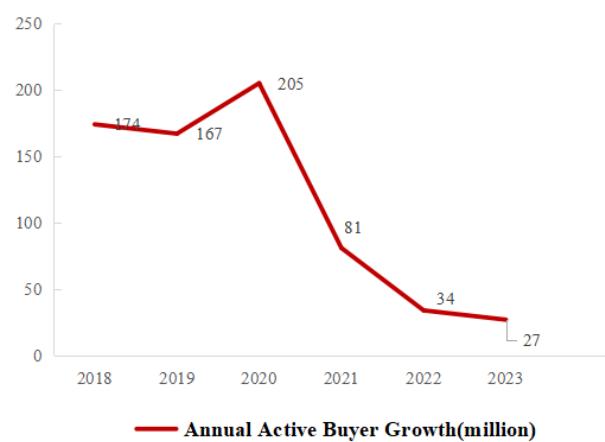
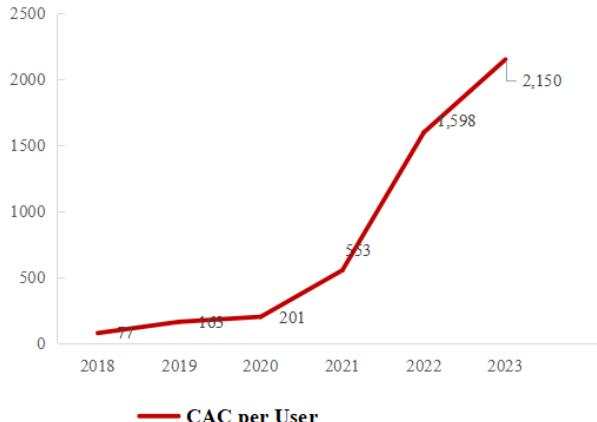
# PINDUODUO



Team Up, Price Down!

Team Up for Savings | Deals | Welcome Surprises !

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



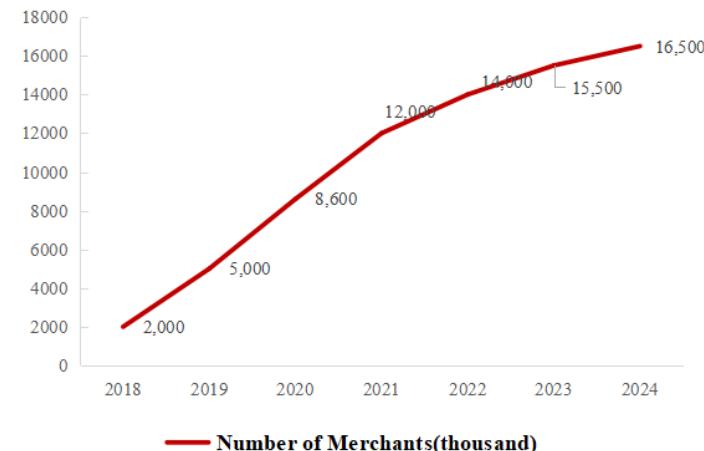
## 1. Social Media Dividend Depletion:



User virality willingness declined.

## 2. Public Traffic Ceiling:

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

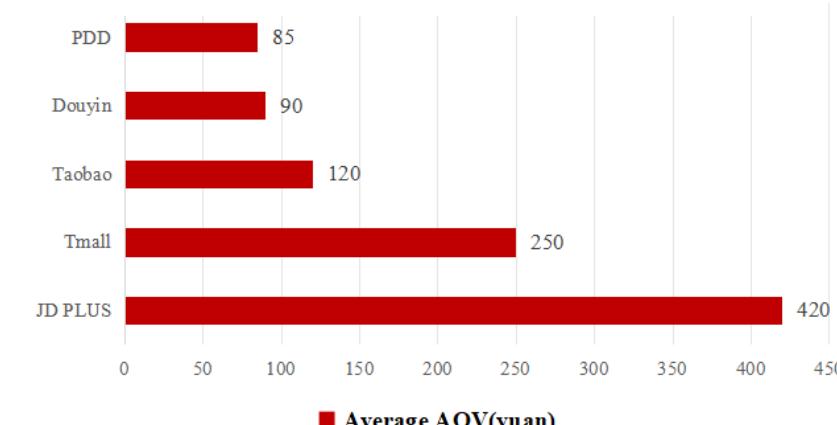
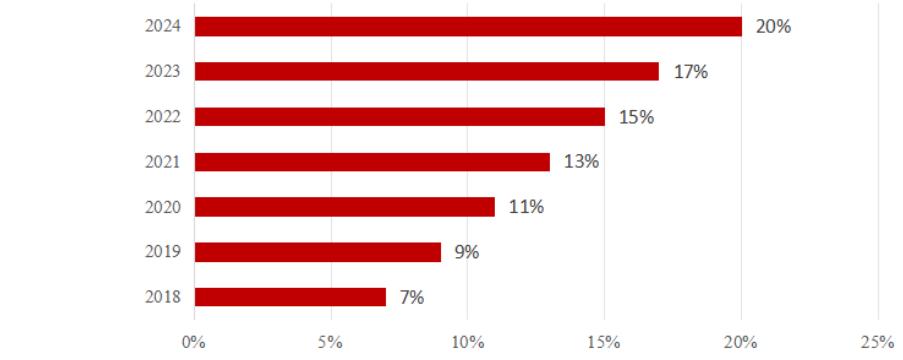


## 1. Industrial Cluster Saturation:

**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

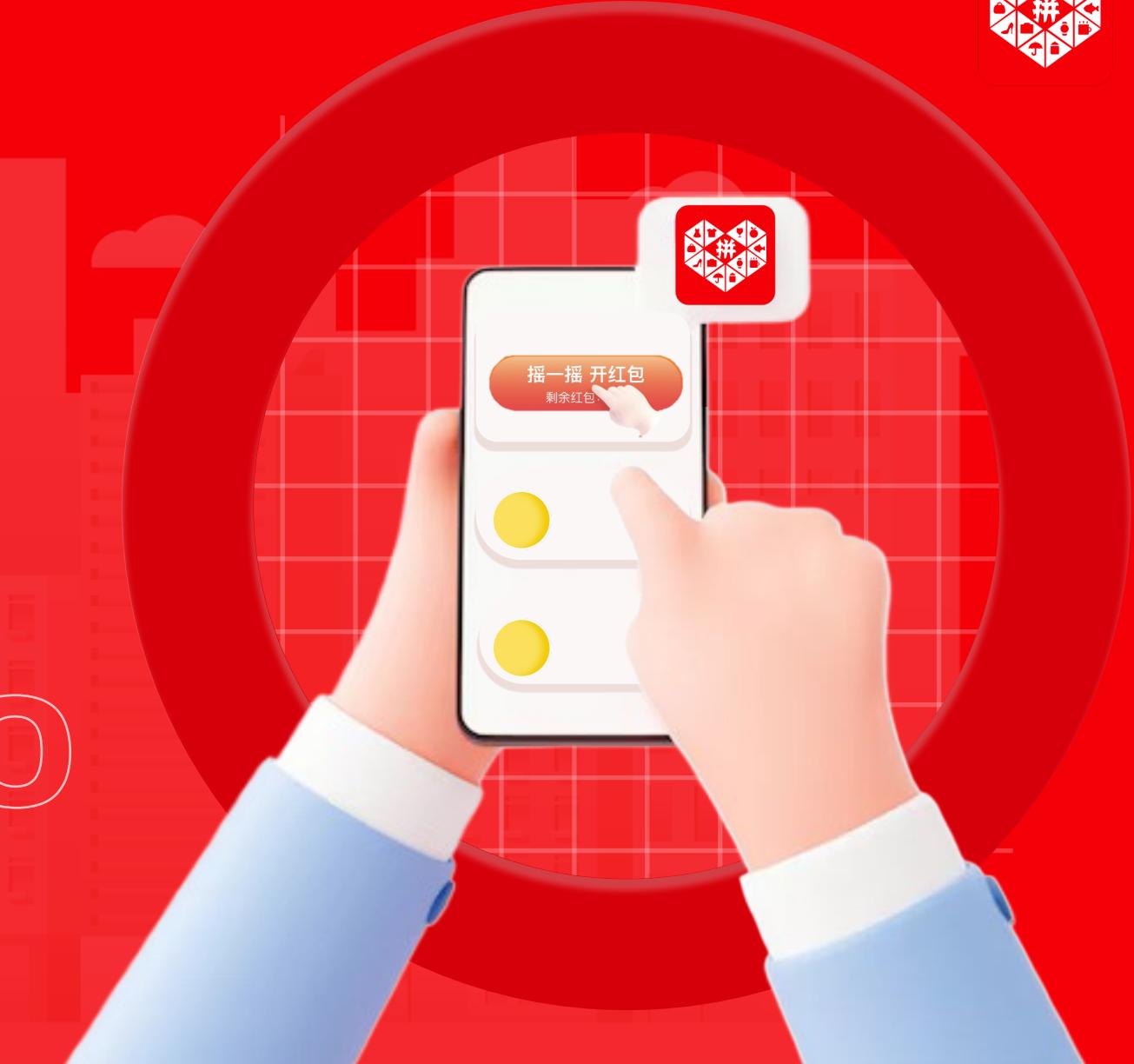
- Merchant co-governance Committee: Invite TOP50 merchants to participate in the rule-making and voting.
- Consumer empowerment: Launch Quality Crowdfunding where users can advance funds in product design.



## PART 04

# Conclusion

# PINDUODUO



# 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.*



# PINDUODUO

# Thank You

April 18<sup>th</sup>, 2025

Group 1: Kai Ren, PeiHua Ji, JunWen Luo, FeiFan Xu,  
Lei Cheng, Chang Li

Team Up, Price Down!

Team Up for Savings | Deals | Welcome Surprises !

