

2020年度寡占理論 (6)

Free Entry under Common Ownership

今日の講義の構成

- (a) Common Ownershipとは
- (b) Payoff Interdependence approachとの関係
- (c) Free Entry
- (d) Free Entry under Common Ownership

Common Ownership

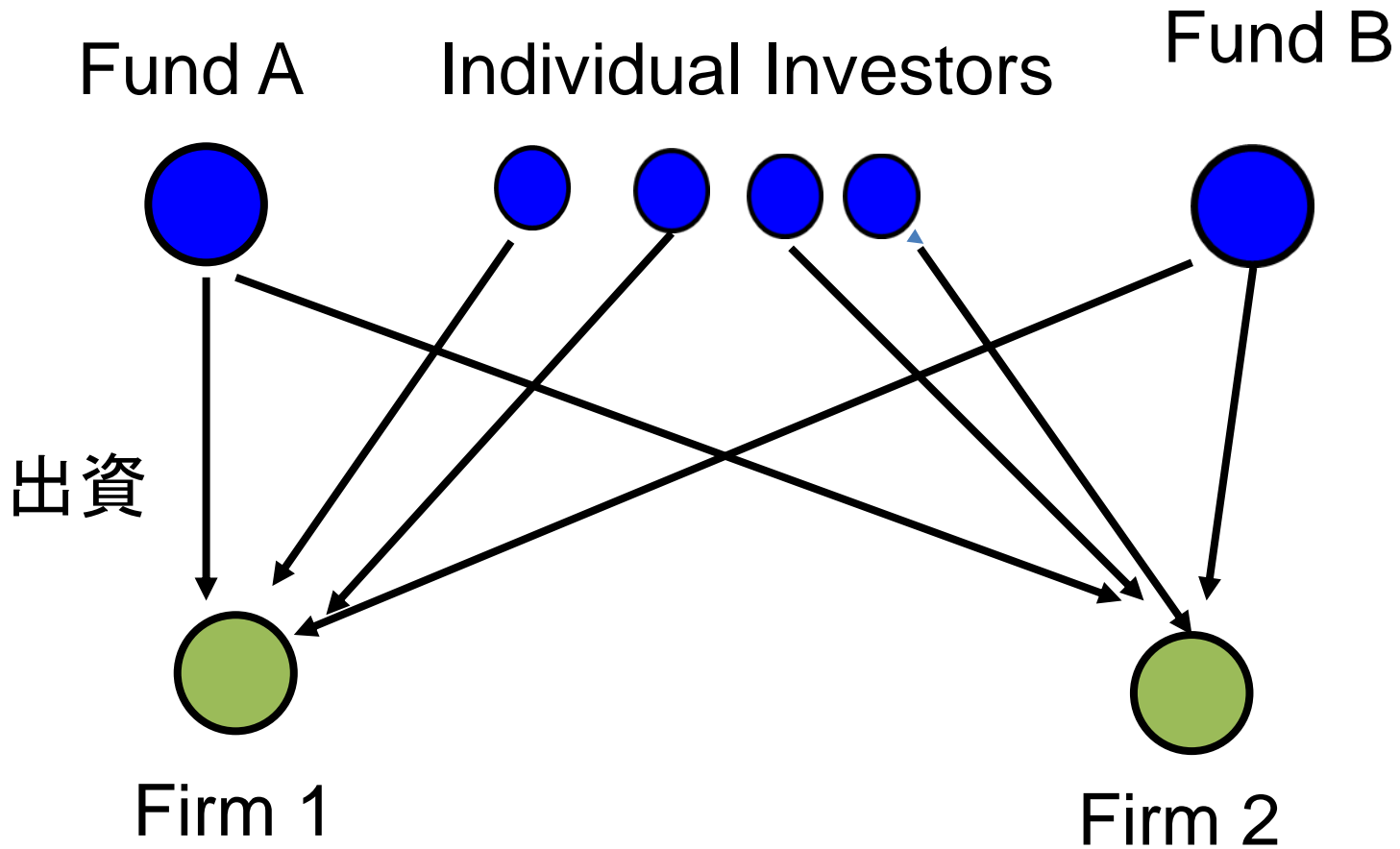
機関投資家・金融機関が複数の企業の株を所有
～ポートフォリオ理論からは自然な行動

Index Fundsの拡大でこの効果は近年更に拡大

企業が株主の利益を考慮して行動すれば、自社の利潤だけでなく、ライバルの利潤も考慮することになる

株式の持ち合いであればより直接的な効果も

Common Ownership



株式所有の効果

支配権の取得

利益分配権の取得

後者に注目

従来は独禁法などの関心も前者に集中

しかし、最近は後者にも注目すべきとの議論も

Common Ownershipと企業の目的関数

ライバル企業の利潤も考慮

→自社の利潤と自社以外の企業の平均的な利潤の加重平均を最大化、自社以外の企業の利潤のウェイトは共通株主の所有シェアに依存

～relative profit maximization approachの発想と本質的に同じ

Relative Profit Maximization Approach

Payoff-Interdependence Approach

Relative profit, relative performance

$U_1 = \pi_1 - \alpha\pi_2$ (its own profit minus α times rival's profit)

Homogeneous product market, symmetric firms. Firms 1 and 2 choose their outputs Y_1 and Y_2 independently.

$\alpha = 1$ perfect competition (Bertrand) \Rightarrow explained in the next slide,

$\alpha = 0$ Cournot,

$\alpha = -1$ Collusion

We can analyze many situations, from perfect competition to collusion, by a single simple model

Relative profit, relative performance

$$U_1 = \pi_1 - \alpha \pi_2 \quad U_2 = \pi_2 - \alpha \pi_1$$

Homogeneous product market, symmetric firms. Firms 1 and 2 choose their outputs Y_1 and Y_2 independently.

$P(Y)$: inverse demand function, C_i : Firm i 's cost function

$$\text{F.O.C.} \quad P + P'Y_1 - C_1' - \alpha P'Y_2 = 0$$

→ At the symmetric equilibrium ($Y_1 = Y_2$),
price = marginal cost when $\alpha = 1$.

Examples of applications

Cartel becomes more stable when α is smaller.

(Matsumura and Matsushima, 2012)

R&D level is non-monotone with respect to α , U-shaped

(Matsumura et al, 2013, Shibata, 2014)

An increase of α reduces innovation size and increases R&D expenditure.

The optimal degree of privatization is decreasing in α

(Matsumura and Okamura, 2015)

Examples of applications

The degree of product differentiation is decreasing in α when α is positive and not too small in a Hotelling model.

→ Central agglomeration appears when $\alpha = 1$ but it is not robust under cost asymmetries and no pure strategy equilibrium exists under even a slight cost difference between two firms, Matsumura and Matsushima (2011),

When α is large, Multi-Store Paradox is solved (Hirose and Matsumura, 2016).

Rationalizations for relative performance approach

- (1) market evaluation for CEOs
- (2) evolutionary approach
~ each firm mimics the firm's behavior that obtains the largest profit at that time
- (3) envy, altruism
- (4) Delegation game ~ endogenous choice of α .
- (5) election, political science
- (6) status, macroeconomics (relative wage, relative consumption, relative wealth, relative income)

Common Ownershipと参入

参入後にCommon Ownershipが発生

Common Ownership→競争の抑制⇒価格の上昇

～参入してしまえば収益性が高くなる

⇒参入の誘因を増加させる

参入前からCommon Ownershipがある

(例) 東京ガスが電力市場に参入、東京電力がガス市場に参入、医薬品メーカーが新薬の開発市場に参入

Common Ownership→参入を抑制

～参入を抑制する効果と促進する効果が存在

→どちらの効果が大きいのか？

Common Ownershipの参入抑制効果 と経済厚生

Common Ownership→参入を抑制

参入企業数が変わらなくても価格の上昇によって消費者余剰は減る

参入企業数が減ればその効果は更にひどくなる。

経済厚生への効果は？

元々参入企業数は過剰（過剰参入定理）

～参入企業数の減少は経済厚生を改善する可能性も

The model of free entry

All firms are symmetric *ex ante*. There are sufficiently large number of potential entrants.

In the first stage, each firm chooses whether or not to enter the market. It costs F when a firm enters the market. It is sunk.

In the second stage, after observing the number of entering firms N , firms face Cournot competition.

Excess Entry Theorem

Free entry equilibrium \sim excess profit is zero.

The second-best number of firms : the number of firms when the welfare-maximizing social planner can control the number of firms but cannot control the output of each firm.

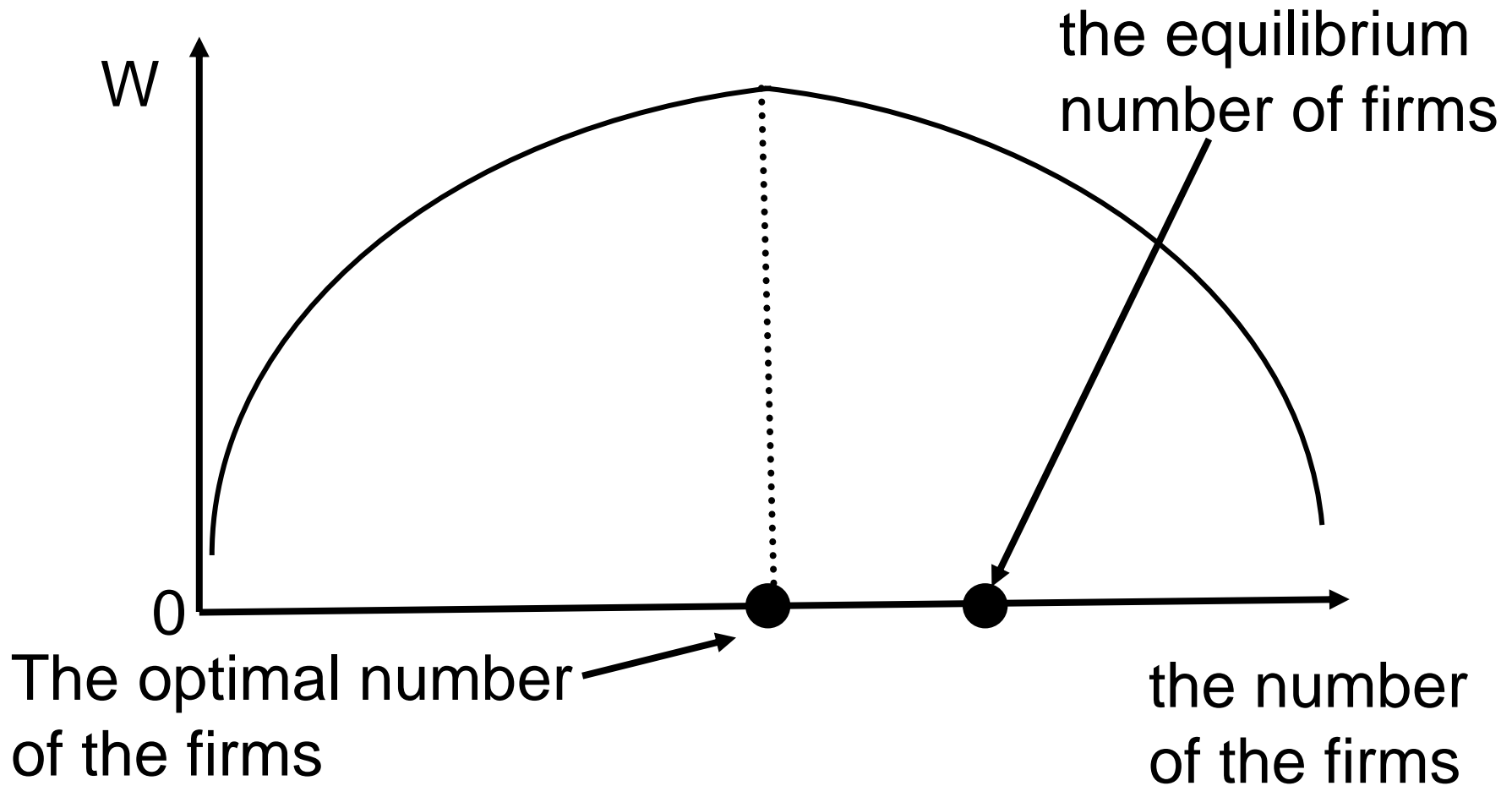
The first best number of firms : the number of firms when the welfare-maximizing social planner can control both the number of firms and the output of each firm.

Excess Entry Theorem

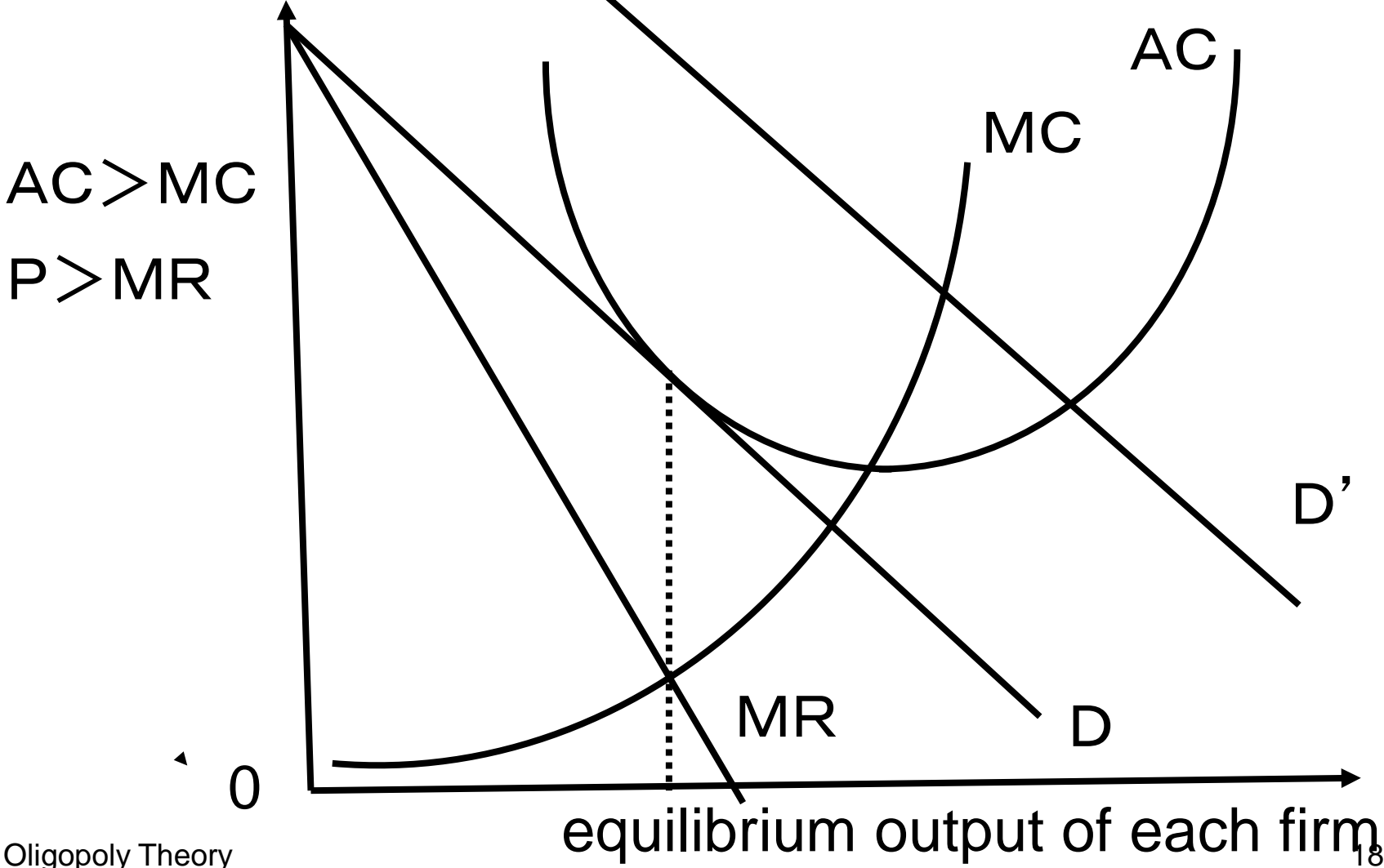
Usually, the second-best number of firms $>$ the first-best number of firms.

Excess entry theorem: the equilibrium number of firms $>$ the second best-number of firms.

Excess Entry theorem



Long-Run Equilibrium under Cournot Competition



the number of firms and welfare

In the second stage, given N , the output of each firm, $y(N)$ is determined.

$$W = \int_0^{y(N)N} P(Q) dQ - NC(y(N)) - NF$$

$$\partial W / \partial N = P(y + y'N) - C - NC'y' - F$$

At the free entry equilibrium, the profit of each firm is zero. Then $\partial W / \partial N = (P - C')y'N$

Since the market competition is imperfect, $P - C' > 0$.

→ If $y' < 0$, $\partial W / \partial N < 0$ at the free entry equilibrium ~ **excess entry theorem**

$y' < 0 \Leftrightarrow$ an increase of the number of firms reduces the output of each firm, quite a natural situation

Intuition behind the excess entry theorem

A decrease in the number of entering firms
cost-reduction \sim average cost \times the output of each firm
cost-increase \sim marginal cost of each firm \times the
difference of the output of each firm
average cost $>$ marginal cost
cost-reduction dominates cost-increases \sim welfare
improving production substitution from new entrant to
the existing firms

Intuition behind the excess entry theorem

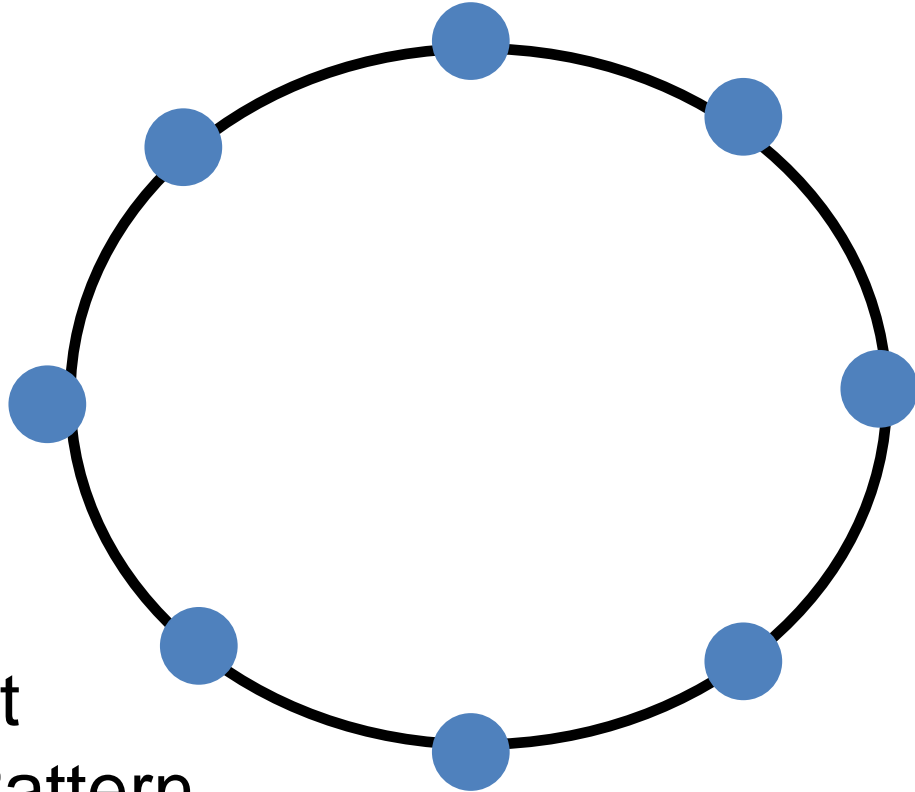
Since the price is always equal to the average cost, marginal reduction of the consumption does not affect the welfare.
⇒ marginal reduction of the number of firms from the equilibrium level always improves welfare.

excess entry theorem in location models

Additional effect of the number of firms to welfare ~
transport costs.

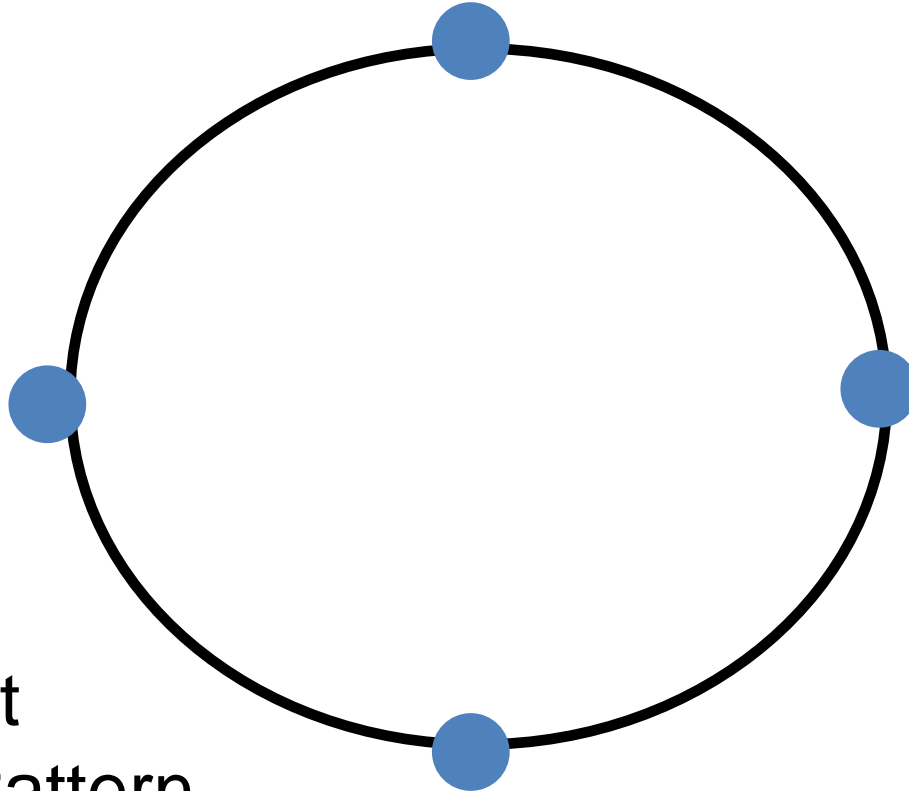
An increase in the number of firms reduces the transport
cost (love of variety)

Salop Model: Equilibrium



Equidistant
Location Pattern

Salop Model: Social Optimum



Equidistant
Location Pattern

Excess Entry Theorem in Spatial Model

Transport cost is linear \rightarrow excess entry (Salop, 1979)

This holds true if transport cost is convex.

cf the example of insufficient entry (Matsumura and Okamura 2006, IJIO)

If we consider integer problem, excess entry holds if the transport cost is linear but not if it is strictly convex (Matsumura, 2001).

If the demand is elastic, insufficient entry can take place (Gu and Wenzel, 2009)

Excess Entry Theorem in Spatial Model

shipping model, Bertrand competition

inelastic demand \rightarrow excess entry

elastic demand \rightarrow it is possible that the number of firms is insufficient (Matsumura and Okamura 2006, Letters).

Our model

Using a standard Salop model.

A mill pricing model with a circular city.

Transport cost is proportional to the distance.

Each consumer purchases one unit of product from the firm that offer lowest (price + transport cost)

Only one the difference is each firm's payoff function.

Each firm care about both its own profit and average profit of other firms. The weight of other firms' profit is increasing in the degree of common ownership.

Results on Equilibrium

参入後の価格競争の性質

均衡価格は n の減少関数で λ (Common ownershipの程度) の増加関数

参入企業数の性質

唯一の安定的な均衡企業数は λ の減少関数 (命題 1)

Common Ownershipは企業の参入意欲をそぐ

Results on Welfare

均衡の総余剰は λ に関して逆U字型（命題2）

小さな割合のCommon Ownershipは経済厚生を改善するが、大きくなりすぎると悪化させる

$\lambda=0$ の時には過剰参入。 λ が増加して参入企業数が減ると経済厚生が改善。でも λ が一定以上大きくなると過小参入に転じる。それ以上 λ が増加すると経済厚生が下がる。

参入後にのみCommon Ownershipが存在

均衡企業数は λ の増加関数で、総余剰は λ の減少関数

Common Ownershipは過剰参入を悪化させるから

Salop Modelの限界

総消費量が価格に依存しない

→総余剰は参入費用と移動費用の和の最小化。価格が上がることによる経済厚生への損失が発生しない。

～Common ownershipによる価格上昇に起因する経済厚生への損失が発生しない

←Common ownershipによる経済厚生改善効果をj過大評価しているかもしれない。

通常のCournot Modelを使うのが自然だが、線形の需要関数・費用関数を使ってすら解析的な分析は困難

～独占と複占の比較ならなんとかできた

数量競争

既に1社（企業1）が参入している独占市場にもう1社（企業2）が参入する誘因があるか否かを分析

参入前からCommon ownershipが存在

需要関数は製品差別化のある線形の需要関数

数量競争下での参入の誘因

企業が参入するか否かは参入したときと参入しなかったときの粗利得（参入費用を含まない参入後の利得）の差が、参入費用を上回ったときその閾値を F^E とする。 F が F^E を下回るときのみ参入。 F^E が大きいほど、より参入が起こりやすい市場

F^E は λ の減少関数→Common ownershipは参入を抑制する

数量競争下での参入の誘因

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F^E は λ の減少関数→Common ownershipは参入を抑制する

Welfare Implications

企業が参入する方が経済厚生が高いか否かは参入したときと参入しなかったときの粗経済厚生（参入費用を含まない参入後の総余剰）の差が、参入費用を上回ったとき

その閾値を F^W とする。 F が F^W を下回るときのみ参入によって経済厚生が改善する。

F^W が大きいほど、参入によって経済厚生が改善しやすい

$F^W > F^E \rightarrow$ 過小参入

$F^W < F^E \rightarrow$ 過剰参入

Welfare Implications

F^W は λ の減少関数→Common ownershipが大きいほど、
参入が経済厚生を改善しにくくなる

$F^W > F^E$ （過小参入）となるケースがあり、 λ が大きいほど過小参入になりやすい

Salop Modelで導出したのとよく似た結果

過剰参入のケースで λ が増加すると経済厚生が改善するかもしれないが、過小参入の状況で λ が更に上がると確実に経済厚生は悪化する

**Thank you very much for your kind
attention**

非常感謝