Finance and Competition

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Finance and competition: The conventional wisdom

- ▶ The obvious part

  1. Many business activities require start up capital
  2. A willing individual who does not have sufficient own funds or cannot raise the required funds from external sources cannot pursue these activities
  3. ⇒ Financial constraints represent a barrier to entry

- ▶ The non-obvious part

  1. Financial constraints limit the number of firms operating in financially dependent sectors
  2. Financial constraints hinder competition in product markets

If this is true then Financial Development has additional benefits (such as the promotion of competition)

What do we know about the nexus of finance and competition?
Almost nothing!!!

The empirical evidence

- Rajan and Zingales, 2003, JFE. Financial development and
  the number of firms $\uparrow$ and average firm size $\rightarrow$ in financially
  dependent sectors
- Haber, 2000. Financial liberalization in Brazil and Mexico
  during 1880-1930. Effect on concentration indexes in cotton
  industry $\downarrow$
- Cetorelli and Strahan, 2006, JF. Deregulation in state banking
  in the US. Effect on the number of firms $\uparrow$, average size $\downarrow$,
  concentration in non-financial sectors $\downarrow$
- Bertrand, Schoar and Thesmar, 2007, JF. Deregulation in the
  French banking industry. Effect on firm entry-exit $\uparrow$, level of
  product market concentration $\downarrow$

Theory Front

Nothing !!

Exclusive concern with the *strategic* relationship between financial decisions and output market decisions when both financial and product markets are imperfectly competitive (in partial equilibrium)

- ▶ How investors (financial intermediaries) select financial contracts or instruments in order to influence the customer firm's – as well as its rivals' – competitive behavior: pricing decisions, the incentive to enter, the incentive to collude (Brander and Lewis, 1986, AER)

- ▶ How firms select the financial contracts or instruments in order to influence the investor's incentives to finance other firms (whether or not to provide funds to potential entrants, to rivals of the firms (Cestone and White, 2003, JF)

What do we do in this paper?

Study in general equilibrium how the amelioration of financial constraints affects competition in product markets

The environment

The financial system

- ▶ No moral hazard or adverse selection problems
- ▶ No uncertainty
- ▶ Sole role of the financial system: Intermediation between savers and investors
- ▶ We compare two economies. One with and the other without asset markets

Industrial structure

- ▶ Static, general equilibrium, two sector model
- ▶ One sector is financially dependent (it requires the use of capital), the other is not
- ▶ The financially dependent sector is imperfectly competitive (a la Cournot) while the other sector is perfectly competitive

Types of agents

- ▶ Agents are heterogeneous in terms of
  1. ability (efficiency)
  2. initial wealth
- ▶ They can operate in only one sector

Questions

How financial constraints affect

- ▶ The quantity and relative prices of the goods produced in capital dependent sectors?
- ▶ The number and size of firms
- ▶ The degree of product market competition, as measured by standard indicators of market shares and markups

What is the role played by the level as well as differences in ability and wealth?

Main findings

- ▶ The amelioration of financial constraints *always* increases competition (lowers the Lerner index of markups) in financially dependent sectors even when other standard concentration indexes indicate otherwise
- ▶ Output in the financially dependent sector expands. Its relative price declines
- ▶ Effects on the number of firms, firm size, concentration, depend on joint distribution of ability and wealth

The model can generate positive net firm entry, smaller average firm size and lower concentration following the development of financial markets (the patterns alleged in the empirical literature)

The model

Individual i, i=1..N, is characterized by ability a_i and initial wealth $\bar{k}_i$. $a_i, \bar{k}_i$ are publicly observed.

Production: Capital dependent sector (1)

$$q_i = q_{i1} = a_i k_i^{\beta}, \beta \in (0, 1)$$

Capital independent sector (2)

$$q_{i2} = A$$

Utility

$$u(c_{i1}, c_{i2}) = \log(c_{i1}) + \gamma \log(c_{i2}),$$

Equilibrium in a Financially Unconstrained Economy

Optimal production scale in sector 1

$$p \left(1 - \frac{q_i}{Q_1} \right) = MC \left(q_i \right) \qquad (1)$$

$k^* = k^*(a_i, p, Q_1)$ is the profit maximizing choice of capacity for type a_i.

Minimum scale of operation in sector 1 (break even point for a_i)
$k_{min}(a, p)$: It satisfies $p a_i k_{min}^{\beta} - k_{min} = A$

Threshold value $a = \tilde{a} : k^* = k_{min}$
If $a_i \geq \tilde{a}$, produce in sector 1. Otherwise choose 2

Choice and scale of activity depends only on ability

Computation of equilibrium

Equilibrium in a Financially Constrained Economy

Choice and scale of activity depends on both ability and wealth

$$q_i^c = min\{a_i \bar{k}_i^{\beta}, a_i(k_i^*)^{\beta}\} \tag{2}$$

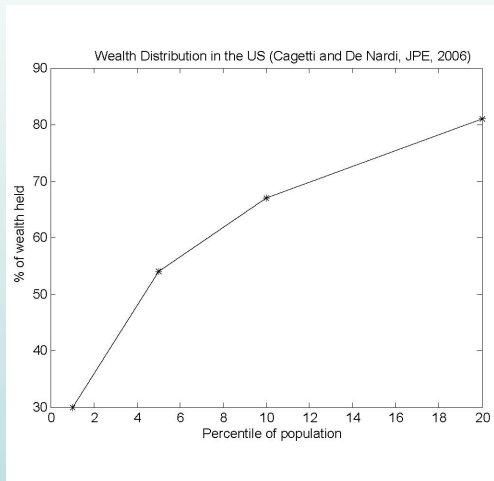Properties of equilibrium

Implications for sectoral output and prices

The amelioration of financial constraints leads to a lower relative price and a higher quantity of the financially dependent good.

Implications for competition, net firm entry, firm size and concentration
Some properties may depend on the joint function of wealth and ability as well as on the other parameters of the model.

Wealth Distribution in the US (Cagetti and De Nardi, JPE, 2006)

Let $\bar{k}_i = f(i)$, $a_i = g(i)$.

We know a little about f (wealth) and nothing about g (ability).

We select f in order to match US distribution.

A simple transformation of

$x_{i+1} = \theta x_i, 0 < \theta < 1, i = 1..N, x_1 = sup\{x\}$ does the job.

Differences in ability: We experimented with a large number of specifications

Homogeneous ability and wealth

The lifting of financial constraints

- ▶ makes markups and the Lerner index decline, as $p^u < p^c$ and $MC^u > MC^c$
- ▶ leads to net firm exit, and to an increase in average firm size and concentration

Homogeneous ability, heterogeneous wealth

▶ Competition *always* increases with the amelioration of the financial constraint. The Lerner concentration index always declines, independent of the curvature of f and whether net entry or exit occurs, etc.

▶ A sufficient condition for the model to replicate the patterns alleged in the literature is that the largest firms are not subject to financial constraints.

Table: Heterogeneous wealth, homogeneous ability

$\bar{K}$	n	K	Q_1	Q_2	p	σ	HH(4)	size	n_c	q_c
						Convex wealth, Constant ability				
16.22	**158**	62.9	109.3	205.2	1.4	**0.0063**	0.025	0.69		
	159	15.7	53.7	204.6	3.8	0.80833	0.074	0.33813	159	1
64.91	**183**	72.6	126.4	190.2	1.4	**0.0054**	0.021	0.69		
64.91	164	47.9	91.1	201.6	2.3	0.4502	0.042	0.55	159	0.9471
125.95	**213**	84.9	147.4	172.2	1.4	**0.0046**	0.018	0.692		
125.95	181	71.3	116.0	191.4	2.1	0.2751	0.030	0.641	132	0.62362
403.16	**352**	140.2	243.6	88.8	1.4	**0.0028**	0.011	0.692		
403.16	253	129.2	176.8	148.2	2.3	0.2342	0.021	0.699	160	0.49218

Note: The lines containing bold characters correspond to the economy without financial constraints. $theta_k = 0.98$, $a = 1$, $\beta = 0.4$, $A = 0.6$, $\gamma = 1$. The number of agents, N is set equal to 500. $\bar{K}$ = economy's endowment of capital, n = equilibrium number of firms, K = capital input, Q_1 = output in sector 1, Q_2 = output in sector 2, p = relative price, σ = Lerner index, $HH(4)$ = share of 4 largest firms, size=average firm size, n_c = number of financially constrained firms, q_c = share of industry 1 output produced by constrained firms.

Heterogeneous ability, homogeneous wealth

► The largest, most efficient firms face the most severe financial constraints.

► The relaxation of the constraint allows these firms to expand, forcing less efficient firms to exit.

► Concentration and average firm size increase, but even in this case, the Lerner concentration index declines

Table: Heterogeneous wealth, heterogeneous ability

$\bar{K}$	n	K	Q_1	Q_2	p	σ	HH(4)	size	n_c	q_c	cor(a,k)
						Convex wealth					
125.95	**23**	110.2	19.4	286.2	15.5	**0.087**	0.49	0.84			
	27	64.3	15.3	283.8	22.6	0.53	0.5	0.57	20	0.96	0.91
	23	110.2	19.4	286.2	15.5	**0.08**	0.49	0.84			
	43	0.006	0.24	274.2	1610	0.99	0.32	0.005	43	1	-0.06
	213	84.9	2.9	172.2	72.3	0.004	**0.018**	0.013			
	181	71.3	2.3	191.4	106	0.275	0.030	0.012	132	0.62	0

Heterogeneous wealth, heterogeneous ability

- ▶ Competition always improves
- ▶ Concentration typically decreases
- ▶ For entry/exit the key consideration is the incidence of the financial constraint over the distribution of ability. If it is the more able that are severely constrained then the amelioration of the constraint is likely to lead to net firm exit. If it is the less able, then the likely outcome is net firm entry.

  This is due to the fact that the efficient firms have a larger scale of optimal scale. When their constraint is loosened, these firms expand significantly, crowding out smaller firms as well as potential entrants. But if they are not constrained, then the industry expansion occurs through new entrants.

Heterogeneous wealth, heterogeneous ability
Under what conditions do we get the stylized facts?
1. Top heavy distribution of wealth (convex wealth)
2. The most able firms should operate relatively unconstrained

- ▶ Positive correlation of wealth and ability
- ▶ Limited variability of ability relative to wealth variability

Additional implications
The relationship between the level of development, the size distribution of firms and the degree of competition in product markets:
For similar ability and wealth functions across countries poorer countries are likely to not only have smaller firms but also less competitive markets than richer countries. They are thus more likely to benefit from further liberalization/advancements in financial markets.

The relationship between incumbency and opposition to liberalization:
Incumbency does not necessarily imply opposition to liberalization. For instance, when the large firms are constrained incumbents may favor liberalization.

Conclusions

- ▶ A general equilibrium model of finance and competition
- ▶ The relaxation of financial constraints leads to more competition in product markets
- ▶ A word of caution: The existence of potentially conflicting patterns in commonly used measures of competition in the presence of differences in ability. Concentration indexes vs markups.
- ▶ The model can replicate alleged stylized facts pertaining to the effects of financial liberalization on firm size, number of firms, concentration indexes.