Discussion of "On the Cost of Financial Intermediation" by De Nicolo, Presbitero, Rebucci and Zhang

Nicolas Crouzet¹

¹Kellogg School of Management, Northwestern University

- The unit cost of finance (Philippon, 2015) is:

 $\psi = \frac{\text{Income of financial intermediaries}}{\text{Intermediated assets}}$

- The unit cost of finance is stable over the very long-run, but increased somewhat from 1970 to late 1990's, then stabilized.

The unit cost of finance over the long run





2. Inverted-U pattern also true for:

$$\psi_{\text{bank}} = \frac{\text{Bank wages} + \text{Bank net income}}{\text{Assets intermediated by banks}}$$

computed from Call reports.

- 3. Beginning of the growth in $\psi_{\rm bank}$ coincides with rise in ICT spending
- 4. End of growth in ψ_{bank} coincides with completion of bank deregulation
- 5. Rationalize the path of ψ_{bank} with model where (a) ICT becomes cheaper, followed by (b) more banking sector competition.

ICT spending and ψ



1. How big are low-frequency movements in the cost of finance?



- Neo-classical growth model, TFP growth $\frac{A_{t+1}}{A_t} = g_A$, exogenous
- Household owns, accumulates and rents capital in perfectly competitive market, at rate:

$$R = r + \delta.$$

- Firms must borrow funds from banks to finance operations.
- Banks: cost $\psi > 0$ per unit of funds intermediated.

Implications of the benchmark

$$(1-\alpha)A\left(\frac{K_t}{L_t}\right)^{-\alpha} = r + \delta + \psi$$

- *K* grows at rate $g_A^{\frac{1}{\alpha}}$, regardless of ψ
- Cost of finance only has a *level* effect on output
- Along balanced growth path, the level effect is:

$$\frac{Y_t^{(\psi+\Delta\psi)}}{Y_t^{(\psi)}} - 1 \approx -\frac{1-\alpha}{\alpha} \frac{\Delta\psi}{r+\delta} \approx -5\% \quad (\Delta\psi = 1\%, r+\delta = 10\%.)$$

So, are fluctuations in ψ quantitatively large?

- Unclear, at least in this benchmark
- Obvious idea: what if ψ affected growth along the BGP?
- Is it the case in the model of this paper?
- More complicated model intermediation is between banks and entrepreneurs who create the capital stock, plus ψ is endogenous
- Useful benchmark:

if ψ were exogenous in this model , would it affect the BGP?

$$(1+r_{B,t})(\mu+(1-\mu)s) = 1+r+\psi \quad (\text{ZPC of bank})$$

$$\Gamma Q_{t-1}^{\frac{1}{1-\xi}} R_t^{\frac{1}{1-\xi}} (1+r_{B,t})^{-\frac{\xi}{1-\xi}} = K_t \quad (\text{Loan demand})$$

$$\left((1-\alpha)\frac{A_t}{R_t}\right)^{\frac{1}{\alpha}} = K_t \quad (\text{Capital demand})$$

Sources of long-run growth

- Exogenous: A_t
- Endogenous: Q_t but grows at rate $\mu\gamma + (1 \mu)\delta$

Trend growth is:

$$g_Y = \left(g_A g_Q^{1-\alpha}\right)^{\frac{1}{1-\xi+\alpha\xi}}$$

where g_A and g_Q don't depend on ψ .

So, again, only level effect:

$$\frac{Y_t^{(\psi+\Delta\psi)}}{Y_t^{(\psi)}} - 1 \approx -\frac{(1-\alpha)\xi}{\alpha\xi + (1-\xi)} \frac{\Delta\psi}{r+\delta} > -5\% \quad (\Delta\psi = 1\%, r+\delta = 10\%.)$$

How do we get the cost of finance to affect long-run growth?

- Need some link between ψ and recovery rates of banks, which determines the growth rate of Q_t .
- The paper, with endogenous $\psi(m)$, seems to have that ...
- ... but still, in GE the growth rate of Q_t is independent of the functional form for $\psi(m)$
- My suspicion: equilibrium $\psi(m)$ is such that the supply of "low-quality" capital (exogenous) is equal the total amount recovered by banks
- No good suggestion here ... but it would nice to see a connection between $\psi(m)$ and g_Q

2. Why do improvements in ICT lead to a higher cost of finance?

Modifying slightly the model, a bank chooses the cost of finance *m* to solve:

$$\max_{b_t,\psi_t} \quad (\mu(1+r_{B,t}) + (1-\mu)D(m_t;Q_{t-1})) b_t - (1+r+m_t)b_t$$

First order condition:

$$(1-\mu)D_m(m_t; Q_{t-1}) = 1$$

If $D_m > 0$, $D_{mm} < 0$ and $D_{mQ} > 0$, then $\frac{\partial m_i}{\partial Q_{i-1}} > 0$: better ICT (higher *Q*) leads to higher unit cost of finance (higher *m*, roughly).

- The bank earns "quasi-rents" from there being decreasing returns in the recovery technology
- Higher *Q* increases these "quasi-rents"
- But what's the evidence/idea behing DRS? Additionally — assumption that *Q* enters *D* is somewhat arbitrary
- What are the implications for lending rates *r*_{B,t}?
 Under perfect competition, they decline with *Q* is this consistent with the data? What about with imperfect competition?

3. Has the cost of *bank* intermediation *to firms* changed?

The cost of *bank* intermediation to *firms*

- The model is about intermediation to firms (financing R&D)
- The data captures total unit costs of bank intermediation
- Is it possible to estimate separate intermediation costs for each sector in the economy? Philippon (2015, footnote 13):

"Even if we had all the data imaginable, we would still need to decide how to allocate costs among may shared activities."

- The call report data does provide data on interest revenue by loan type, separating C&I loans for the rest. But no cost info
- Call reports of specialized banks? Data on workforce occupation within banks? Structural approach?

Bank vs. non-bank finance

- The model is about intermediated finance (bank loans), but this only accounts for about 30% of the stock of corporate debt outstanding in FoF
- The stock of bank loans is not growing as fast as the stock of corporate debt overall during this time period
- That may imply that the unit cost of *bank* finance for firms is rising faster than the unit cost of *non-bank* finance ...
- ... except if C&I lending profits (plus wages to loan officers) have been growing more slowly than for the rest of the industry
- Again, difficult data problem

Conclusion

- Interesting paper, on a puzzling phenomenon
- It seems really strange that unit costs of (corporate) finance would not have declined with ICT revolution! But evidence suggests that's the case
- Do more on the mechanism sign of the effect of ICT, overall magnitude