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

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- 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

Figure 3. Unit Cost of Financial Intermediation

Notes: The raw measure is the ratio of finance income to intermediated assets displayed in Figure 1. The quality adjusted measure takes into account changes in firms' and households' characteristics. Data range is 1886-2012.
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Notes: The raw measure is the ratio of finance income to intermediated assets displayed in Figure 1. The quality adjusted measure takes into account changes in firms' and households' characteristics. Data range is 1886-2012.

As an accounting framework for household finance, corporate finance, and liquidity provision, the size of the various markets varies significantly over time. The most important trend in credit markets in recent years is the increase in household debt. The business credit market is relatively large in the 1920s, small in the 1960s, and large again after 1980, although not as large as in the late 1920s. I also measure the market value of outstanding equity and the flows of initial and seasoned offerings. Deposits, repurchase agreements, and money markets mutual funds are used to measure liquidity services. After aggregating the various types of credit, equity issuances, and liquid assets into one measure, I obtain the quantity of financial assets intermediated by the financial sector displayed in Figure 2.

I can then divide the income of the finance industry by the quantity of intermediated assets to obtain a measure of the unit cost. Figure 3 shows that this unit cost is around 1.5-2 percent and relatively stable over time. In other words, I estimate that it costs $0.02 per year to create and maintain $1 of intermediated financial asset. I also find clear evidence that financial services are produced under constant returns to scale. For instance, from 1947 to 1973 (a period of stable growth without major financial crises), real income per capita increases by 80 and real financial assets by 250 percent, but my estimate of the unit cost of intermediation remains remarkably constant.

The raw measure of Figure 3, however, does not take into account changes in the characteristics of borrowers. The final contribution of the paper is to perform quality adjustments to the quantity of intermediated assets. The 1920s and 1990s measurement discussed throughout the paper. It differs a little bit from that of Merton (1995). I do not attempt in this paper to measure the informativeness of prices. This issue is tackled by Bai, Philippon, and Savov (2011). See the discussion at the end of Section III.
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 \( \psi_{\text{bank}} \) coincides with rise in ICT spending

4. End of growth in \( \psi_{\text{bank}} \) coincides with completion of bank deregulation

5. Rationalize the path of \( \psi_{\text{bank}} \) with model where (a) ICT becomes cheaper, followed by (b) more banking sector competition.
Note: Panel A plots the cost of finance and ITC expenditure. Panel B plots the cost of finance and major regulatory changes.

The cost of bank intermediation is constructed by using bank-level data from Call Reports. It is defined as the ratio of banking income over intermediated assets. Thus,

$$\text{CFI} = \frac{\text{Salaries} + \text{Net Income} \times \text{Cash} + \text{Loans} + \text{Securities} + \text{Equity}}{}$$
1. How big are low-frequency movements in the cost of finance?
Figure 5: Cost of Banking and Size of Credit Intermediation

Panel A: Cost of Banking Finance

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit cost</th>
<th>Cost of finance</th>
<th>Cost of financial intermediation</th>
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<tbody>
<tr>
<td>1976</td>
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<td>2016</td>
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Panel B: Finance Industry

<table>
<thead>
<tr>
<th>Year</th>
<th>Value added share of GDP (%)</th>
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<tbody>
<tr>
<td>1963</td>
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<tr>
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<td>2011</td>
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<td>2015</td>
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</tbody>
</table>

Note

3 Model

In this section we set up a growth model with financial intermediation to interpret the evidence reported before.
We need a benchmark

- 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 \(\psi\)

- Cost of finance only has a \textit{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 $\psi$ quantitatively large?

- Unclear, at least in this benchmark

- Obvious idea: what if $\psi$ 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 $\psi$ is endogenous

- Useful benchmark:
  
  if $\psi$ were exogenous in this model, would it affect the BGP?
This paper, with exogenous $\psi$ and perfect competition

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

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

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

Sources of long-run growth

- Exogenous: $A_t$

- Endogenous: $Q_t$ — but grows at rate $\mu \gamma + (1 - \mu) \delta$
Distortions arising from $\zeta$

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 $\psi$.

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 $\psi$ 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:

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

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 $\frac{\partial m_t}{\partial Q_{t-1}} > 0$: 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 behind 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 banking 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?
- 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
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