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Banking competition in Brazil

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Faculdade de Economia, Administração, Contabilidade e Gestão de Políticas Públicas

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Abstract

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List of Figures

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List of abbreviations and acronyms

ABNT	Associação Brasileira de Normas Técnicas
abnTeX	ABsurdas Normas para TeX

List of symbols

Γ	Letra grega Gama
Λ	Lambda
ζ	Letra grega minúscula zeta
$\in$	Pertence

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1 Introdução

2 The model

The model proposed by Ho e Saunders (1981) assumes a market of homogeneous banks working as intermediary dealers. Each bank borrows money from clients to lend it to other clients. Borrowers and lenders arrive randomly on a Poisson distribution, the probability of a new deposit transaction and a new loan transaction are given by:

$$\lambda_D = \alpha - \beta a \tag{2.1}$$

$$\lambda_L = \alpha - \beta b \tag{2.2}$$

Banks can influence the probability of a new deposit or loan by changing it's prices (making it more or less attractive for new clients). The prices for deposits P_D and for loans P_L are:

$$P_D = p + a \tag{2.3}$$

$$P_L = p - b \tag{2.4}$$

where p is the "true" price of the loan or deposit, and a and b are fees that banks can use to increase the probability of a new deposit or loan.

The bank's wealth portfolio (W) is given by $W = Y + I + C$, where Y is the base wealth which is invested in a diversified portfolio, I is the credit inventory and C is the money market position (or short-term net-cash) which is the difference between money market loans borrowings. The expected utility of wealth is given by the following equation:

$$EU(W) = U(W_0) + U'(W_0)r_w W_0 + \frac{1}{2}U''(W_0)(\sigma_I^2 I_0^2 + 2\sigma_{IY} I_0 Y_0 + \sigma_Y^2 Y_0^2) \tag{2.5}$$

The r_w is the expected rate of return on wealth, σ_I^2 is the variance of the credit inventory, σ_Y^2 is the variance of the base wealth and σ_{IY} is the covariance between I and Y. For each new deposit transaction, the initial credit inventory changes by Q and the credit inventory is $I_0 - Q$. The utility of one deposit transaction is:

$$\begin{aligned} EU(W|\textit{one deposit transaction}) = {} & U(W_0) + U'(W_0)aQ + U'(W_0)r_W W_0 \\ & + \frac{1}{2}U''(W_0)(\sigma_I^2 Q^2 + 2\sigma_I^2 QI) \\ & + \frac{1}{2}U''(W_0)(\sigma_I^2 I_0^2 + 2\sigma_{IY} I_0 Y_0 + \sigma_Y^2 Y_0^2) \end{aligned} \tag{2.6}$$

Similarly, for each new loan transaction, the credit inventory is $I_0 + Q$ and the utility of one loan transaction is:

$$\begin{aligned} EU(W|\textit{one loan transaction}) = {} & U(W_0) + U'(W_0)bQ + U'(W_0)r_W W_0 \\ & + \frac{1}{2}U''(W_0)(\sigma_I^2 Q^2 - 2\sigma_I^2 QI) \\ & + \frac{1}{2}U''(W_0)(\sigma_I^2 I_0^2 + 2\sigma_{IY} I_0 Y_0 + \sigma_Y^2 Y_0^2) \end{aligned} \tag{2.7}$$

$$EU(W|a,b) = \lambda_D EU(W|\textit{one deposit transaction}) + \lambda_L EU(W|\textit{one loan transaction}) \tag{2.8}$$

Deriving the equation 2.8 with respect to the fee a to maximize the wealth, we get to:

$$\frac{\partial EU(W|a,b)}{\partial a} = -\beta\left(U'(W_0)aQ + \frac{1}{2}U''(W_0)\sigma_I^2(Q^2+QI)\right) + (\alpha-\beta a)U'(W_0)Q = 0 \tag{2.9}$$

From 2.9:

$$a = \frac{1}{2}\frac{\alpha}{\beta} + \frac{1}{4}\left(-\frac{U''(W_0)}{U'(W_0)}\right)\sigma_I^2(Q+I) \tag{2.10}$$

Doing the same for the fee b:

$$\frac{\partial EU(W|a,b)}{\partial b} = -\beta\left(U'(W_0)bQ + \frac{1}{2}U''(W_0)\sigma_I^2(Q^2-QI)\right) + (\alpha-\beta b)U'(W_0)Q = 0 \tag{2.11}$$

$$b = \frac{1}{2}\frac{\alpha}{\beta} + \frac{1}{4}\left(-\frac{U''(W_0)}{U'(W_0)}\right)\sigma_I^2(Q-I) \tag{2.12}$$

The credit spread is defined by $S = a + b$. Substituting a and b above for S we get:

$$S = \frac{\alpha}{\beta} + \left(-\frac{U''(W_0)}{U'(W_0)}\right)\sigma_I^2 Q \tag{2.13}$$

This is the credit spread that will be estimated in the model, in which the first term α/β is the bank's neutral risk spread

3 Conclusão

Bibliography

HO, T. S. Y.; SAUNDERS, A. The Determinants of Bank Interest Margins: Theory and Empirical Evidence. *The Journal of Financial and Quantitative Analysis*, JSTOR, v. 16, n. 4, p. 581, nov. 1981. ISSN 0022-1090.

Appendix

APPENDIX A – Quisque libero justo

Quisque facilisis auctor sapien. Pellentesque gravida hendrerit lectus. Mauris rutrum sodales sapien. Fusce hendrerit sem vel lorem. Integer pellentesque massa vel augue. Integer elit tortor, feugiat quis, sagittis et, ornare non, lacus. Vestibulum posuere pellentesque eros. Quisque venenatis ipsum dictum nulla. Aliquam quis quam non metus eleifend interdum. Nam eget sapien ac mauris malesuada adipiscing. Etiam eleifend neque sed quam. Nulla facilisi. Proin a ligula. Sed id dui eu nibh egestas tincidunt. Suspendisse arcu.

Annex

ANNEX A – Morbi ultrices rutrum lorem.

Sed mattis, erat sit amet gravida malesuada, elit augue egestas diam, tempus scelerisque nunc nisl vitae libero. Sed consequat feugiat massa. Nunc porta, eros in eleifend varius, erat leo rutrum dui, non convallis lectus orci ut nibh. Sed lorem massa, nonummy quis, egestas id, condimentum at, nisl. Maecenas at nibh. Aliquam et augue at nunc pellentesque ullamcorper. Duis nisl nibh, laoreet suscipit, convallis ut, rutrum id, enim. Phasellus odio. Nulla nulla elit, molestie non, scelerisque at, vestibulum eu, nulla. Ut odio nisl, facilisis id, mollis et, scelerisque nec, enim. Aenean sem leo, pellentesque sit amet, scelerisque sit amet, vehicula pellentesque, sapien.