

Testing for Competition in the South African Banking Sector

Joshua Greenberg and Witness Simbanegavi*

* Disclaimer: The views expressed herein are solely those of the authors.

Background

- ▶ This paper examines the competitiveness of the South African banking sector.
- ▶ An efficient banking sector is important for the proper functioning of an economy.
 - ▶ Banks act as intermediaries between borrowers and lenders.
 - ▶ Banks advance credit to firms and consumers.
 - ▶ Banks act as the primary conduit for monetary policy.
- ▶ Two approaches to measuring competition:
 - ▶ Panzar and Rosse approach (Panzar and Rosse, 1987)
 - ▶ Bresnahan approach (Bresnahan, 1982)

Panzar and Rosse Approach: Theoretical Model

- ▶ Measures competition by establishing how each bank's revenues react to changes in input prices.
- ▶ The measure of competition is the H -statistic.
 - ▶ H measures the responsiveness of revenues to a proportionate increase in the input prices.

Estimated H	Competitive Environment
$H \leq 0$	Monopoly / Colluding Oligopoly
$0 < H < 1$	Monopolistic Competition
$H = 1$	Perfect Competition

Panzar and Rosse Approach: Distinguishing monopoly from competition

- ▶ **Monopoly.**
 - ▶ Increase in input costs increases marginal costs. This results in higher price and lower quantity. Since demand is elastic, revenues will fall.
 - ▶ Revenues therefore move in the opposite direction to input costs, and the H -statistic is less than or equal to 0.
- ▶ **Perfect Competition.**
 - ▶ Increase in costs increase marginal and average costs.
 - ▶ Some banks make a loss and leave the industry. Demand facing the remaining banks increase. Exit will occur until remaining banks make just normal profits.
 - ▶ At this point prices would have increased by the same percentage as the increase in input costs and revenues would have increased by the same amount. Thus $H=1$

Panzar and Rosse Approach: Empirical Model

- ▶ The model used is

$$\ln INTR = \alpha + (\beta \ln AFR + \gamma \ln PPE + \delta \ln PCE) + \theta \ln BSF + \varphi \ln OI + \varepsilon$$

- ▶ $INTR$ is the ratio of total interest revenue to total balance sheet
- ▶ AFR is the ratio of annual interest expense to total deposits
- ▶ PPE is the ratio of staff expenses to total balance sheet
- ▶ PCE is the ratio of physical capital expenses to fixed assets
- ▶ BSF is bank specific factors
- ▶ OI is the ratio of other income to total balance sheet
- ▶ ε is the stochastic error term
- ▶ The H -statistic is equal to $\beta + \gamma + \delta$, the elasticities of interest income with respect to input prices.

Panzar and Rosse Approach: Results

Variable	Small Banks	Large Banks	All Banks
AFR (Proxy)	0.181*	0.706***	0.251
PPE	0.497***	0.275***	0.572***
PCE	-0.099	-0.014	-0.076*
OI	-0.081	0.015	-0.103
BSF – Equity	0.016	0.093*	0.091
BSF – Loans	-0.033	0.011	-0.035
Constant	-0.265	1.004***	0.361
R ²	0.738	0.983	0.740
H	0.58	0.97	0.75

* Significant at the 10% level.
 *** Significant at the 1% level.

Bresnahan Model: Theoretical Model

- ▶ The Bresnahan model uses industry data to determine the industry demand and supply for deposits.
- ▶ This supply and demand is used to determine the market power of the average bank.
- ▶ The statistic used to determine the degree by which prices are above marginal costs is the λ coefficient.

Estimate λ	Competitive Environment
$\lambda = 1$	Monopoly / Colluding Oligopoly
$0 < \lambda < 1$	Monopolistic Competition
$\lambda = 0$	Perfect Competition



Bresnahan Model: Empirical Model

- ▶ Demand Equation:

$$DEP = \alpha_0 + \alpha_1 r_{dep} + \alpha_2 EX_D + \alpha_3 EX_D \cdot r_{dep} + \epsilon$$

- ▶ Supply Equation:

$$r_{dep} = -\lambda \frac{DEP}{\alpha_1 + \alpha_3 EX_D} + \beta_0 + \beta_1 DEP + \beta_2 EX_S + \psi$$

- ▶ r_{dep} is the market deposit rate
- ▶ DEP is the real value of total deposits
- ▶ EX_D are the exogenous variables that affect industry demand, but not marginal costs
- ▶ EX_S are the exogenous variables that influence supply, but not demand.



Bresnahan Model: Results

- ▶ Exogenous Demand Variables (EX_D):
 - ▶ Gross Domestic Product
 - ▶ Money Market Rate
 - ▶ Government Bond Rate
 - ▶ Unemployment
- ▶ Exogenous Supply Variable (EX_S):
 - ▶ Aggregate Wages
- ▶ Coefficient of compound $x = -\lambda$.
- ▶ The result from the Bresnahan Model: $\lambda = 0.00046$.
- ▶ High level of competition in the market for interest incomes.



Summary of findings

- ▶ Based on Panzar and Rosse methodology, we find that

	Small banks	Large banks	All banks
H-statistic	0.580	0.967	0.748

- ▶ Monopolistic competition for small banks
- ▶ Perfect competition for large banks
- ▶ Based on Bresnahan methodology, $\lambda = 0$, suggesting high levels of competition in the market for interest incomes.
- ▶ The *H-Statistics* for comparator countries to SA (India, Brazil, Argentina, Latvia, etc) lie between 0.64 and 0.83.



Conclusions

- ▶ This paper has used two models to determine the level of competition in the market for interest income.
- ▶ We find evidence of high levels of competition in this market.
- ▶ Interpretation:
 - ▶ At least in the market for deposits and loans, competition is significant.
 - ▶ Cannot say much with respect to non-interest income.
- ▶ Further papers including Claessens & Laeven (2003) and Darji (2009) have also supported this outcome.

