

# **The Determinants of Bank's Profits in Latin America: Does Relative Power matters?**

**Emre Ozsoz**  
Fordham University

**Jorge Guillén**  
ESAN  
Graduate School of Business

**Erick Rengifo**  
Fordham University

# Purpose

- During the 90's most of Latin-American banks started to open their economies and liberalize the financial system which was controlled mostly by the government (Quispe-Agnoly and McQuerry, 2001).
- Bank concentration has not changed:  
Even though that Argentina has more than 100 banks, the concentration is high as well as in Peru or Chile.

# Motivation

**Table 1: Composition of Banks in Latin America after liberalization**

Source: Forster and Shaeffer, 2005

Country	Number of Banks	Foreign-Owned (%)	Deposit in top 5 Banks (%)
Argentina	111	44	52
Brazil	151	17	60
Chile	27	45	61
Peru	19	40	81

# Literature Review

- This regional issue can be located back in the early 1900 when Kemmerer Mission. (see Drake, 1989)
- For example, Kemmerer plans made to drop the number of banks in Colombia from thirty five in 1924 to sixteen in 1930. The four foreign bank in this country loomed largely than before
- Similar policies of Kemmerer were implemented in the Latin-American countries he did not visit.
- Basically the idea of Kemmerer goes along with the tradeoff between Bank Efficiency and Stability (Northcott, 2004).

# Literature Review

- Outflow of capital is likely and it can be offset with large banks.
- Efficient functioning of the banking sector contributes to economic growth (King and Levine 1993; Levine 1997). So trade off comes up
- Efficiency (for growth) or Concentration (avoid sudden stops).

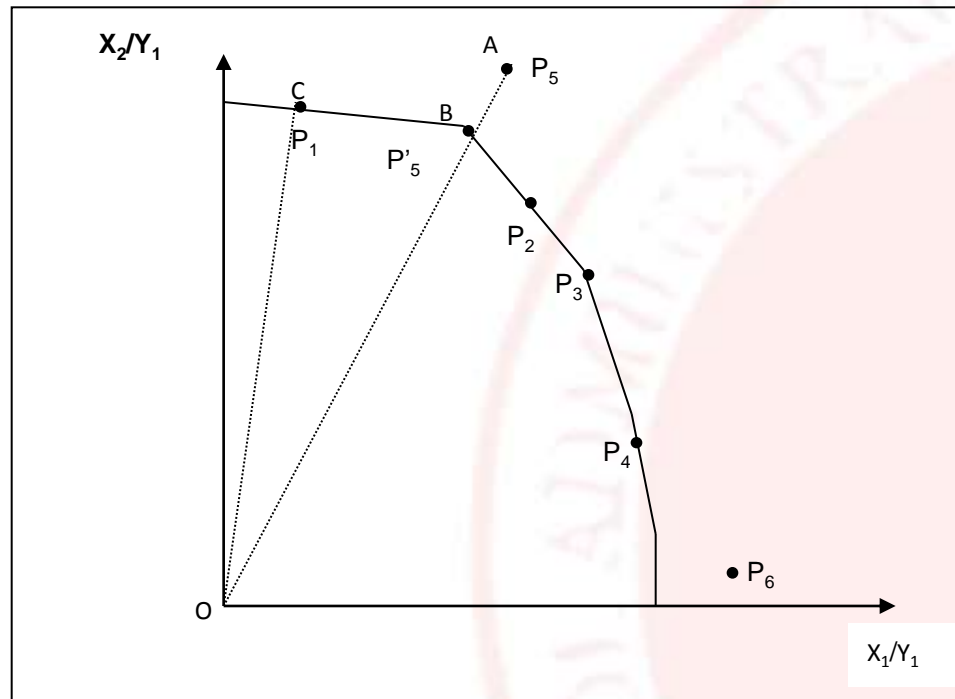
# Hypothesis

- Basically we are finding the determinants of banks' profits for a sample of banks in the Latin American Region
- Bank Concentration and relative power may play some important role that impedes the drop in the profits as well as interest rates.
- Competitiveness in the Latin American region may be stopped due to internal relative power and concentration.

# Data

- The data comes from several financial statements and balance sheets of Argentina, Bolivia, Brazil, Chile, Costa Rica, Ecuador, El Salvador, Mexico, Nicaragua, Paraguay, Peru, Uruguay and Venezuela. The dataset comes from 1987 to 2005 in an annual version (2,138 observations for 13 countries).
- Also from central banks of the respectively countries we have gathered some macroeconomic variables.
- We would like to explore what happened to this period between crises in order to verify the exposure of the Banks in the region

# Data Envelopment Analysis



$X_1$  : Input 1,  $P_i$  are DMUs

$X_2$  : Input 2

$Y_1$  : Output 1



# Data Envelopment Analysis

- We used as inputs: Fixed Assets, Deposits and Money Market Funding plus Time Deposit Interest Expense and Personnel Expenses. The outputs are Interest Income and Total Earning Assets.
- The selection of inputs goes along the line of the literature of banking.
- We use the same idea of Berger and Mester (2003), Killgo and Siemens (1999).

# Data Envelopment Analysis

For several Inputs and outputs:

Min  $\phi$

$$\sum \lambda_j x_{ij} + S^+_{i_0} = \phi x_{i_0}$$

$$\sum \lambda_j y_{rj} - S^-_{r_0} = y_{r_0}$$

$$S^+_{i_0}, S^-_{r_0} \geq 0$$

$$\lambda_j \geq 0$$

$$\forall i, j, r$$

Where  $x_{ij}$  is the amount of  $i^{\text{th}}$  input at DMU  $j$ ,  $y_{rj}$  stands for the amount of  $r^{\text{th}}$  output from DMU  $j$ , and finally  $j_0$  is the DMU to assess.  $S^+_{i_0}, S^-_{r_0}$  are the slack variables.

The linear program is called input oriented model with CRS.

# Results

**Table 2: Summary Statistics of Efficiency by Country**

Country	Median	Min	Max	1Q	2Q	3Q
Argentina	0.701356	0.052215	1	0.4128	0.7639	1
Bolivia	0.956069	0.6517	1	0.9156	1	1
Brazil	0.717626	0.080424	1	0.5184	0.66755	1
Chile <sup>1/</sup>	n.d	n.d	n.d	n.d	n.d	n.d
Colombia	0.934917	0.6049	1	0.86775	1	1
Costa Rica	0.967591	0.563	1	1	1	1
Ecuador	0.874853	0.5176	1	0.7112	1	1
El Salvador	0.960241	0.3126	1	1	1	1
Mexico	0.962131	0.3144	1	1	1	1
Paraguay	0.97122	0.6335	1	0.9794	1	1
Peru	0.962751	0.5375	1	1	1	1
Uruguay	0.931574	0.2726	1	1	1	1
Venezuela	0.917559	0.3989	1	0.8724	0.98705	1

# Results

**Table 2a: Summary Statistics of Efficiency by Period**

Period	Mean	Min	Max	1Q	2Q	3Q
1987	n.d	n.d	n.d	n.d	n.d	n.d
1988	n.d	n.d	n.d	n.d	n.d	n.d
1989	0.976033	0.9281	1	0.9281	1	1
1990	0.945406	0.3818	1	1	1	1
1991	0.995648	0.9096	1	1	1	1
1992	0.954013	0.5076	1	0.9728	1	1
1993	0.945462	0.4757	1	0.9728	1	1
1994	0.844204	0.1762	1	0.7029	1	1
1995	0.875482	0.1441	1	0.7615	1	1
1996	0.908558	0.4092	1	0.8622	1	1
1997	0.800195	0.080424	1	0.5436	1	1
1998	0.73869	0.2169	1	0.48695	0.7965	1
1999	0.769192	0.2645	1	0.50045	0.9145	1
2000	0.813959	0.077024	1	0.6103	0.9439	1
2001	0.80857	0.081089	1	0.632	0.9289	1
2002	0.857111	0.052215	1	0.7776	1	1
2003	0.797188	0.1011	1	0.5972	1	1
2004	0.849507	0.2309	1	0.7139	1	1
2005	0.944152	0.4025	1	0.926	1	1

# Model and Assessment

- $ROE = \alpha + \beta_1 * Power_{ijt} + \beta_2 * DEA_{ijt} + \beta_3 * VGDP_{jt} + \beta_4 * Log(Assets)_t + \beta_5 * Year Control_t + \varepsilon_{ijt}$

- Where:

ROE : Return on Earnings

Power : Dummy that describes the largest three banks within a country

DEA : Efficiency

VGDP : Real growth real of a country

Size : Logarithm of Assets

- The subindexes 'i', 'j' and 't' corresponds for a particular bank, country and time period

# Results

**Table 3: Determinants of ROE**

Variables	Dependent Variable : ROE				
	Model 1	Model 2	Model 3	Model 4	
<b>Constant</b>	-7.669 (5.1855)	-32.415 (9.8188)	*** -29.952 (7.1924)	*** -6.288 (7.8132)	
<b>Power</b>	7.624 (4.7091)	*		6.516 (4.7683)	
<b>DEA</b>	15.986 (5.7446)	***	18.699 (5.8454)	*** 17.003 (5.6981)	*** 18.030 (5.8868)
<b>VGDP</b>	0.468 (0.2256)	**	0.455 (0.2779)	0.4543 (0.2250)	** 0.434 (0.2786)
<b>Size</b>			7.082 (1.5976)	*** 6.852 (1.5406)	***
<b>Dummie of Years</b>	NO	YES	NO	YES	
<b>Observations</b>	2 138	2 138	2 138	2 138	
<b>R2</b>	0.0157	0.0508	0.0433	0.0265	

\*\*\* Significant at 1%

\*\* Significant at 5%

\* Significant at 10%

# Conclusions

- Basically microeconomic or internal variable like efficiency and macroeconomic variable like VGDP result with the expected positive sign on ROE. Also, whenever we control for size and local power or market concentration there is also a positive and expected sign that prove our hypothesis that market share avoid drop of bank's margin.
- Our result is relevant for policy maker who looks for alignment of interests between banks and customers.
- Trade off between bank concentration and efficiency should be taken into account.