

Is Efficiency the Equivalent to a High Rate of Return for Private Pension Funds?

Evidence from Latin-American Countries

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Motivation

- Latin America is performing much better than at any time since the 1960s.
- Economic growth has averaged over 5 percent a year since 2004 (International Monetary Fund (IMF), 2008).
- Despite the high price of gas, corn, and soy, inflation has been generally low, direct investment is hitting two-digit growth, and the region's current account and fiscal accounts are both in surplus (See IMF, 2008).
- The successful performance of the Latin American economies can largely be attributed to favorable external shocks. The boom in China's economy caused an increased demand for some commodities, leading to an increase in the price of Latin American exports (Deutsche Bank, 2006; Waggoner, 2006).
- Despite the slowdown in some developing economies, growth in Latin America has not faltered. The credit crunch has so far had little discernible effect. As long as international prices of commodities continue to increase, the pace of growth for Latin American countries seems to be assured (The Economist 2008).

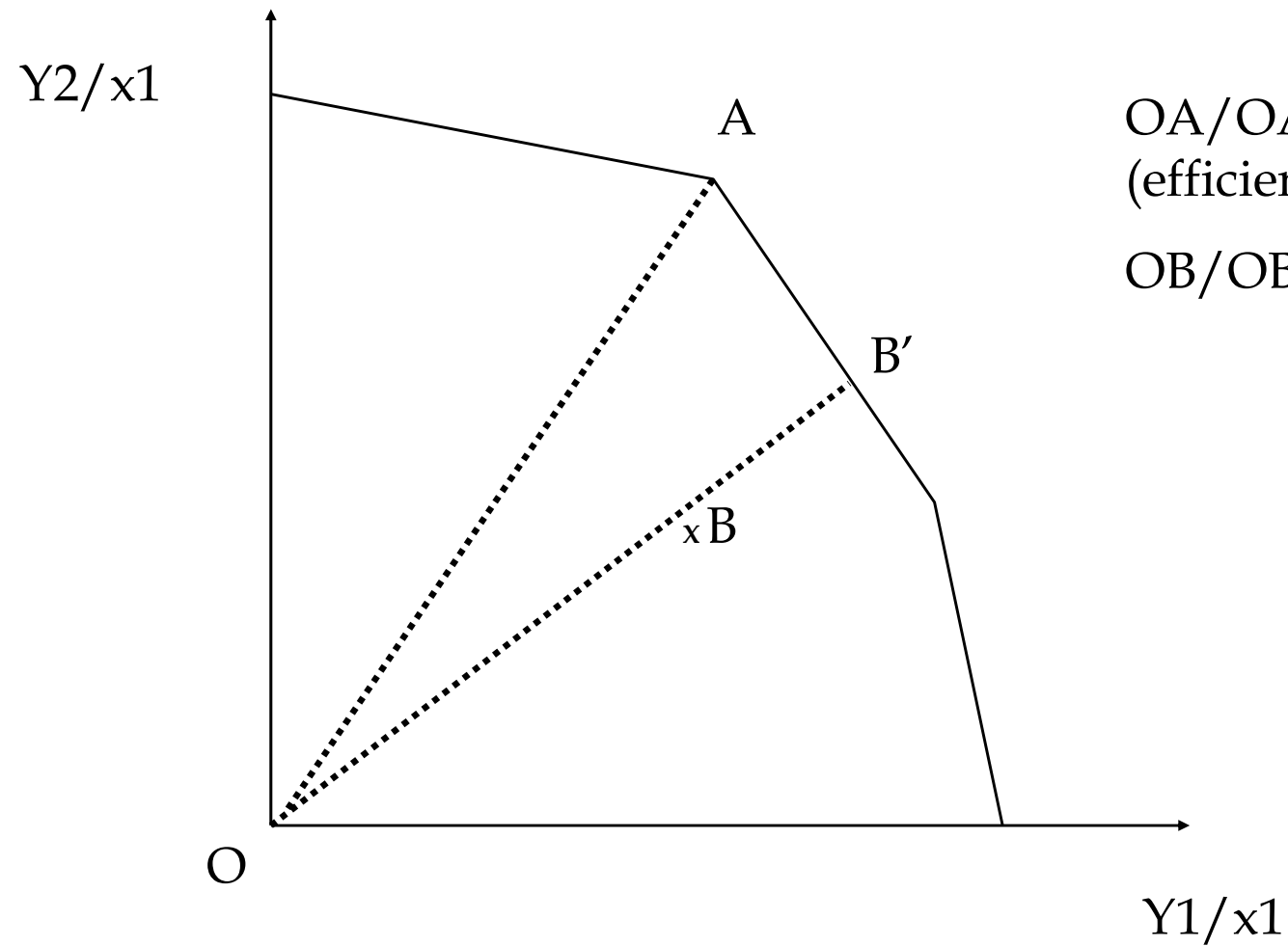
Motivation

- This positive macroeconomic environment in the Latin American region has permitted a good performance in the portfolio rate of return of private pension funds (AFPs), averaging 7.88 percent, 9.91 percent, and 3.09 percent in 2005, 2006, and 2007 respectively.
- **The purpose of this paper is to verify whether the boom in the AFPs' performance is consistent with the good management of these institutions.**
- **Difficult to measure**

Measurement of Efficiency

- The assessment of management quality introduces some difficulties into the analysis. The most important problem is measuring management quality
- In this paper, we measure management quality with Data Envelopment Analysis (DEA).
- DEA is a particular frontier analysis technique which measures the efficiency of a decision-making unit (DMU).
- There is agreement in the literature that efficiency scores should be able to identify whether the AFP is processing multiple input-outputs in an efficient manner (Hansweck, 1977; Martin, 1977; Pantalone and Platt, 1987).

DEA-Farrel Measures



$OA/OA=1$
(efficient)

$OB/OB' < 1$

DEA (Charnes, Rhodes).

$$\text{Min } \varphi$$

$$\sum \lambda_j x_{ij} + S^+_i = \varphi x_{ij_0}$$

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

$$S^+_i, S^-_i \geq 0$$

$$\lambda_j \geq 0$$

$$\forall i, j, r$$

Where :

x_{ij} : is the amount of i^{th} input at DMU j ,

y_{rj} : stands for the amount of r^{th} output from DMU j ,
and finally

j_o : is the DMU to assess.

S_i^+, S_r^- : are the slack variables



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DATA

- We use the Asociación Internacional de Organismos de Supervisión de Fondos de Pensiones (AIOS) as a source of quarterly data from March 2005 to December 2007. It includes nine countries in the sample: Argentina, Bolivia, Chile, Colombia, Costa Rica, El Salvador, Mexico, Peru, Dominican Republic, and Uruguay. In the end, we did not calculate scores of efficiency for Bolivia and El Salvador because of lack of information for these countries.
- The most common applications of DEA have been done for banks (see, for example, Barr *et al.*, 1999; Berger and DeYoung, 1997; Berger and Mester, 2003). Some papers in the literature apply these DEA indicators of efficiency to analyze the links between efficiency and nonperforming loans (Berger and De Young, 1997). DEA is also very popular for CAMEL models and therefore for predicting the failure of a bank (Hansweck, 1977).
- We use as AFP outputs, total revenue and number of contributors and as AFP inputs, administrative cost and sale cost. This input/output selection has been used previously in empirical analysis by Barrientos (2001) and Pestana et al. (2008). The availability of data for all the AFPs in the region permits us to discriminate inputs and outputs in this way. It makes sense to say that according to the selection of these multiple inputs and outputs, the AFP will have a management decision to incorporate the necessary input allocation and product mix decisions needed



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Table 1: Key indicators of AFPs

Country/Vari able	Number of AFPs	Market Share of the Largest AFP (% Contributor)	Number of Transfers/ Affiliates ¹	Affiliates (Millions)	Contribut ors (Millions)	Total Expenses/ Contributors	Annual Real Rate of Return
Argentina	12	0.18	2.21	11.70	4.67	62.53	8.28
Bolivia	2	n.d	0.03	1.03	0.00	n.d	2.97
Chile	6	0.19	0.71	7.85	3.61	90.29	11.17
Colombia	6	0.33	n.d	7.41	3.21	208.85	8.91
Costa Rica	8	n.d	13.97	1.59	0.70	93.35	6.25
Salvador	2	0.51	1.33	1.50	0.55	51.6	1.72
Mexico	21	0.17	13.29	37.50	14.20	87.73	6.34
Peru	5	0.30	8.03	3.99	1.61	84.54	21.17
Dom. Republic	7	0.33	0.23	1.53	0.78	11.73	8.60
Uruguay	4	0.45	0.14	0.75	0.47	35.47	2.29

Source: AIOS



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Table 2: Summary of results for efficiency during the period 2005-2007

Country	Absolute Efficiency	Relative Efficiency
Argentina	0.49	0.72
Bolivia	Nd	Nd
Chile	0.50	0.85
Colombia	0.42	0.94
Costa Rica	0.31	0.68
El Salvador	Nd	Nd
Mexico	0.66	0.68
Peru	0.43	0.90
Dominican Republic	0.65	0.86
Uruguay	0.36	0.97

REVIEW OF LITERATURE

- The reform of pension funds in Latin America has resulted in the creation of private pension funds. This has had an important effect of these economies (Barrientos, 2001).
- The reformers of pensions in Latin America claimed that the pensions needed to be set up in a competitive framework (Barrientos, 2001).
- However, according to Stiglitz and Orszag (1999), there is a myth about how a competitive framework leads to low administrative costs in a decentralized pension fund.
- The history of Latin American AFPs can be traced back to 1981 with the pension reform in Chile. Then came reforms in Peru (1993), Colombia (1993), Argentina (1994), Uruguay (1996), Bolivia and Mexico (1997), El Salvador (1998), and Costa Rica (2001).

REVIEW OF LITERATURE

- The history of Latin American AFPs can be traced back to 1981 with the pension reform in Chile. Then came reforms in Peru (1993), Colombia (1993), Argentina (1994), Uruguay (1996), Bolivia and Mexico (1997), El Salvador (1998), and Costa Rica (2001).
- The pension system can have public and private administrators, but in most of the countries, the AFPs belong to private owners. The regulation of AFPs is not the same for each country. One of the main issues concerning regulation is the possibility of investment abroad which is allowed for all the countries except El Salvador
- However, if AFPs withdraw all the local funds for investment options abroad, the local government may exert pressure on the economy. The latter is a latent risk for open small economies like those of Latin American countries (Rajan and Parulkar, 2008).

REVIEW OF LITERATURE

- Investment limits have been the subject of interest in other regions like OECD countries and Japan. Even in developed countries, there are restrictions on limits for investments abroad because AFPs' funds can be used for financing government budgets or social investments, such as low-cost housing and low-interest mortgages. For more about retail, see Vittas (1998).
- Another regulation issue in AFPs is the minimum profitability which ensures that people have a reliable, fair, and simple system.
- Minimum profitability helps to protect investors in the less deep emerging financial market that characterizes the Latin American region. This minimum requirement of profitability may change from country to country.



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Table 3: Determinants of AFPs' portfolio rate of return

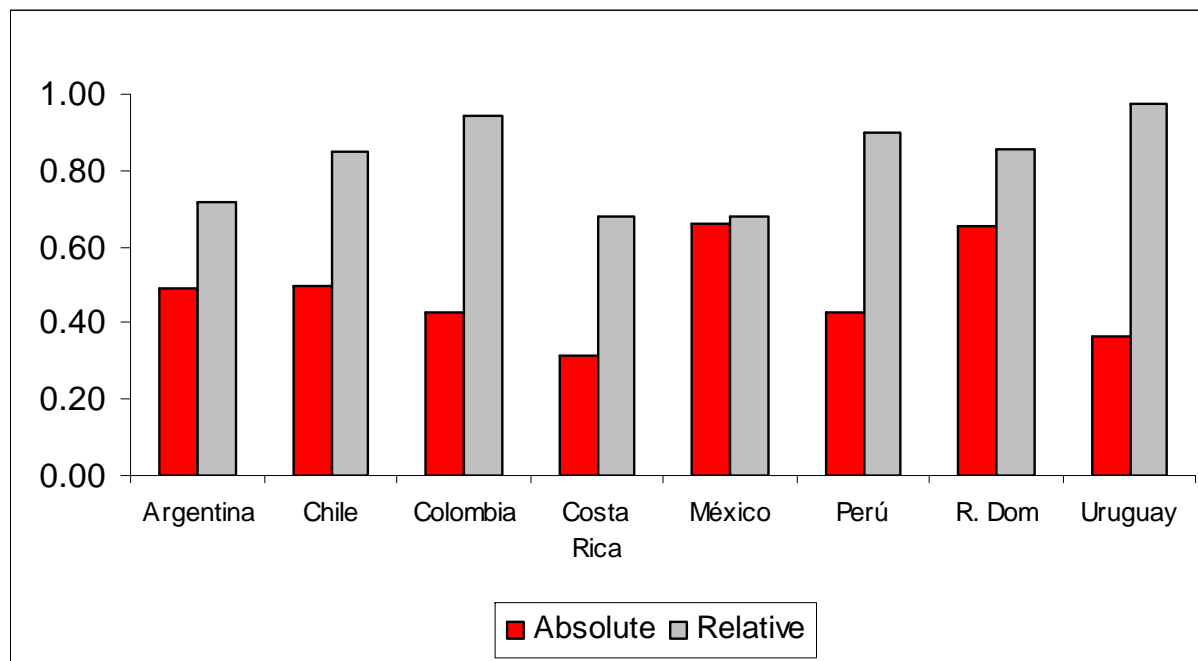
Variables	Dependent Variable : Real Rate of Return			
	Model 1	Model 2	Model 3	Model 4
Affiliates/Contributors	0.465	-0.036	0.299	0.858
Transfers/Funds	0.002	-0.003	0.001	-0.005 *
Regulation	-0.940	-8.686 *	-2.065	
Relative Efficiency	-4.188 ***	0.259	-2.065 ***	1.219
Absolute Efficiency	2.814 ***	-0.592	2.150 **	0.675
Variation of Exchange Rate	-0.219 ***			-0.341
Growth of GDP	0.267 ***			0.220 ***
Fixed Effects	No	No	No	Yes
Control for Years	Yes	No	Yes	No
Control for Countries	Yes	Yes	Yes	No
Observations	592	592	592	592
Adjusted R2	0.6590	0.5323	0.6364	0.4220

*** Significant at 1%

** Significant at 5%

* Significant at 10%

Figure 2: Absolute and relative efficiency for the Latin American Region (average for 2005-2007).



Source: FIAP

Note: Absolute efficiency is estimated for the whole set of AFPs in the region while relative efficiency is the estimation within a country.

Conclusions

- This study shed light on the role of market power in the private pension funds in Latin America. Our results support the view that local economic benefits may have induced excellent performances in the stock market and, consequently, increased the real rate of return of AFPs.
- In our sample, local management of AFPs does not explain good performance in the portfolios of these private pension funds. This suggests that local market power is not enough to create a good portfolio for AFPs. In contrast, absolute power in the market is important and significant in the portfolio of private pension funds which means that large AFPs operating on a significant scale are able to diversify better.
- The recent international crisis or other external and negative shocks would reduce the good performance of the stock market in the region, and hence, policymakers in the region should monitor the necessity for good management of the funds.

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