A NONPARAMETRIC ANALYSIS OF INVESTMENT BANKS' **EFFICIENCY IN THE CURRENT GLOBAL CRISIS**

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Abstract

The purpose of this study is to assess to what extent the business model practiced by investment banks, before the beginning of the financial crisis, has influenced their performance indicators, and especially those who express shareholders' satisfaction. To this end, we have applied a nonparametric method, called Data Envelopment Analysis, which allows obtaining the efficiency scores for each financial institution considered. The sample included two pure investment banks, Lehman Brothers and Goldman Sachs, and seven international financial groups carrying out investment banking activities. The model tested assumed the maximization of selected output variables (ROE and the dividend distributed), by considering several input variables, meant to summarize the risk profile and costs arising from implementing a particular business model. The results obtained, in the form of high inefficiency scores, indicate that the business model of investment banks was not better performing than that applied by financial groups, because it failed to ensure a balance between ownership compensation and sustainable expansion of financial activity. JEL classification: C14, G24

Keywords: investment banks, business model, data envelopment analysis, efficiency score.

Introduction

Over the last decades the field of investment banking activity has been the subject of extensive changes, especially in terms of services granted to customers. Consequently, the composition of the revenues recorded has evolved from the commissions they earned to the revenues from trading debt instruments, particularly in the OTC market and income from corporate advisory business.

According to Morrison, Wilhelm (2007), the fundamental role of investment banks consists in acting like an intermediary between those holding information and wanting to sell it and the investors and security issuers who purchase it. They argue that investment banks exist because they maintain an information marketplace that facilitates information-sensitive security transactions (Morrison, Wilhelm 2007, p.10).

In our paper we intended to assess to what extent the business model adopted by investment banks proves to be efficient, from the standpoint of their performance indicators. The second part of the article presents the changes recorded by the investment banking landscape, focusing on the interference between investment banks and merchant banks' activity and the pace of growth of this industry over the last ten years. In the third part we question whether the investment banks' business model is still viable, in the post-crisis period. We have discussed some trends, as a result of economic and legislative constraints, that will significantly influence the future development of this industry and will reshape investment banks' business strategies. In the fourth part we have empirically investigated whether the investment banks' business model is more efficient, in terms of maintaining

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shareholders' satisfaction, than that employed by traditional banks which provide investment banking services, too. The study comprised two pure investment banks, Lehman Brothers and Goldman Sachs, and seven international financial groups carrying out investment banking activities, during an eight years period. Efficiency scores were computed for each bank in the sample, by applying the Data Envelopment Analysis non-parametric technique. The fifth part synthesizes the results obtained while the last part concludes.

1. Investment banking industry dynamics

In the framework of the financial system, although, in practice, there is a very fine demarcation line between investment banks and merchant banks, however, the two types of institutions providing financial services fulfil different functions. Traditionally, merchant banks activate in the field of securities underwriting, while investment banks participate in financing transactions.

Pure investment banks provide funds for the private businesses and governments, by issuing debt and capital securities, and selling them on the market. In addition, they facilitate mergers and acquisitions and provide financial advisory to companies (Shiller, 2009). Traditionally, they do not operate with the public.

Merchant bank institutions provide international funding, such as corporate investment, foreign real estate investment and international financial transactions. Some of these transactions involve letters of credit, funds transfer, consultancy and co-investment in projects.

Broadly speaking, investment banks focus on initial and private public offerings of shares. Merchant banks tend to operate on a smaller scale (with smaller companies) and offer creative financing options (bridge financing, mezzanine financing, corporate loans). In other words, investment banks are oriented towards big companies, while merchant banks provide services to companies that are too large for venture capital or too small for a public offering of securities.

The doctrine according to which investment banks offered prosperity for all was fully accepted by 2007, the year of the global financial crisis' onset. The specialists outlined the view that commercial banks were dealing with financial capital, while investment banks and merchant banks controlled the intellectual capital.

The economic literature claims there are three key areas of investment banking business, according to the developments of which one can evaluate the performance of this industry, namely: success in running IPO's, business consulting and involvement in mergers and acquisitions. Regarding the first element, that of conducting IPO's, we mention that the main beneficiaries of companies' transformation into public companies were the investment banks. For example, in the U.S., the peak of the IPO's launching had been reached in 2000, with over \$ 100 billion. Studies on successful investment banks, in terms of launching IPO's, show a gradual increase in the cost afforded by companies seeking to benefit from an IPO: in only a few years the commission received by the underwriting syndicate (gross spreads) tripled its level to 7%, double than that practiced in Europe or Asia. According to Hansen (2001), a similar trend has been recorded by the offer price. This stood at 8% during 1978-1991, and then rose to 12% during 1991-1994. In 1995 the initial gain offered by an IPO exceeded 20%, increasing to 69% in 1999 and 56% in 2000.

The quality of consultancy provided to companies, in the form of studies, is the second area of interest when analysing investment banks' performance. Studies show that analysts' recommendations could produce abnormal returns of the market, 98% of all recommendations being of buying, which has generated more business than the recommendation to sell, because they addressed to investors who had cash and wanted to invest.

Regarding the growth recorded by this industry, we point out that in 2007 the gross incomes amounted to \$ 84.3 billion, with 22% more than in 2006 and double than 2003. U.S. was the primary source of revenue for investment banks, with 53% of the total, Europe with 32% and Asia with 15%. Revenues rose with 80% in U.S., in Europe by 217% and in Asia by 250%. Investment banking

industry is concentrated in a few financial centres: London, New York, Hong Kong and Tokyo. It's an industry that must respond rapidly to major developments in financial markets, the main trends consisting of vertical integration and debt securitization.

The investment banks' involvement in a broad range of activities may be associated with a conglomerate with numerous subsidiaries and with a high degree of cross risk and price transfer between lines of business. For this reason it is difficult to assess the degree of profitability for each line of business. In general, it is believed that the brokerage business is the most volatile but also the most competitive line of work.

Podolny (1993) examined the correlation between bank's profit and status, considering that the market on which they are positively correlated is more stable than the one in which status is inversely correlated with profit. The author made the assertion that investment banks have a higher status than commercial banks and can better protect the market. However, it appeared that in only 15 years their profitability has deteriorated significantly. According to Podolny (1993), the relationship between status and profitability need not be on the long run, but an effective relational mechanism. The author defines status as being represented by the performance of a bank in underwriting securities. A bank that proves a high proficiency in the underwriting process can be regarded as if it has a high status, compared to a bank that does not demonstrate such competence.

According to the Securities Industry Association, the average ROE profitability registered by investment banks in the U.S. has evolved from 48% during 1980-1984 to 22% during 1985-1989, 14% during 1990-1994, 21% during 1995 - 1999 and 30% during 2000-2004. Explanation of these increased returns, compared with other types of credit institutions, is due to financial market characteristics. If the market were efficient, then competition would lead to lower prices and commissions, lower returns recorded for the entire industry as a whole. The returns' level specified above shows that the market has not worked effectively due, primarily, to entry barriers, limiting the number of competitors and practicing strategic pricing.

Research carried out by Gach, Sproule (2009) revealed that in the economic boom years the transaction incomes held a share of 75% in total income, while income from corporate advisory business stood at 20%. The years 2008-2009 marked the orientation of investment banks to less risky lines of business, traditional business consulting revenue growth accounting for up to 40%. Analyzing the structure and evolution of revenues (Figure 1), it can be noted that the consultancy is the only line of business which has not experienced significant fluctuations. At the opposite pole lies the revenue from trading debt instruments, particularly in the OTC market.



Figure 1. Investment banking revenues in the period 2005 - 2008 (\$ millions)

2. The opportunity of developing a new business model for investment banks

By 2007, there were no interrogations on investment banks' business model viability. The collapse of investment banks, began in 2007, marked the beginning of wider debate on the possibility of implementing a new business model, to save investment banks. According to the authors Gach, Sproule (2009), a new business model must be based on the concepts of transparency, liquidity and strengthening the supervision of such financial institutions.

In 2008, the Fed has adopted the measure of changing the status of investment banks, which, in turn for having access to credit facilities, were forced to convert into bank holding companies. A bank holding company is a corporation under the control of two or more parties. Becoming holding companies, investment banks can easily obtain capital and agree to be supervised by authorities. As holding companies, Morgan Stanley and Goldman Sachs will create more retail units, in order to attract deposits from customers. The decision took by Morgan Stanley and Goldman Sachs to convert into bank holding companies was considered exceptional, because they were the last independent banks. Turning into bank holding companies, they have had to reduce their leverage.

Change of status means more stability, but lower profits. Such a bank can be regarded as a more secure institution, with a cleaner balance sheet and with a variety of ways for raising funds. This institution will become more bureaucratic and more risk averse. Change of status meant for Morgan Stanley and Goldman Sachs the ability to receive deposits from customers, to receive financial facilities from the Federal Reserve, the possibility of merging with other banks. The immediate effects were the leverage reduction (and hence, lower default risk for the entire financial system) and the possibility given to the two financial institutions to survive.

According to Demirgüç-Kunt, Huizinga (2009), the U.S. went through a complete cycle in terms of regulating financial activity, from the separation of financial institutions in commercial

banks and investment banks (the Glass-Steagall Act in 1933), the reintroduction of universal banking (the Gramm-Leach-Bliley Act in 1999) and by the disappearance of major investment banks in 2008.

Efforts of these banks towards increasing liquidity and transparency will assume a new capital structure. In terms of liquidity risk, complex derivatives will not disappear, but their use will be translated to financial institutions that are better accommodated at managing this risk. Moreover, after 2007, the necessary liquidity for conducting operations has increased and banks' management became more conservative, being less receptive to risk taking.

New regulations, designed to improve transparency in financial markets, are similar to a new standardization in transactions, which means that liquidity providers will be encouraged to enter the market. The core element, around which investment banks' activity will articulate, will be represented by the customer-oriented financial products, which offer an attractive risk/return ratio, in terms of liquidity and increased transparency.

Fremerey and Hagen (2010) argue that long-term success of a business model is based, generally, on five key elements: the growth of business, asset mix, financial institution's size, cost/revenue and market share. The research undertaken by them on 65 banking groups in Europe, which carry out also activities in the field of investment banking, revealed that their orientation towards adopting a business model specific to investment banks hasn't brought substantial improvements in long-term profitability. The authors pointed out that truly sustainable, resilient business models, characterized by low annual volatility of ROE (below 8%) and a rate of long-term ROE of at least 8%, positioned above the Markowitz frontier, are a minority, fact that requires a recalibration of their business strategy.

Figure 2. Distribution of banking groups according to the characteristics of the business model applied



Source: Fremerey F.S., Hagen J.U. (2010) European Banks –The Way Forward Toward Resilient Business Models, p.24

A study by Boston Consulting Group (Saumya, Chandrashekhar, Morel and Grealish, 2009) signals the need for investment banks' business model reinvention, by replacing the aggressive revenue growth strategy with the management of risk-adjusted profitability, while recognizing the

importance of further financial innovation developments. According to the authors, the new generation of investment banks will adopt a business model characterized by simplification and specialization of work, in the sense of maintaining those business lines in which expertise acquired over time can generate competitive advantages. On the other hand, Nielsen and Bukh (2008) state that the concept of business models is, perhaps, the most discussed but least understood of the newer business concepts.

The future of investment banks will be marked by a series of regulations and restrictions on mitigating aggressive strategies and better risk management, mandatory establishment of reserves, a move towards derivatives trading, corporate restructuring, a lower reliance on short-term funds and leverage.

In the current crisis, investment banks show a diminished appetite for risk taking and, in the future, they must face important changes, namely:

 \checkmark have the potential to invest, without reaching a high level of leverage, giving investors an attractive return, coupled with the risk embedded;

 \checkmark to undertake financial innovation on a documented base, by creating financial products able to generate value added. In this regard, it is anticipated that demand for complex, illiquid, traded OTC (e.g. credit default swaps) derivatives will narrow substantially.

Economic and legislative constraints (strict regulation, less leverage, high capital cost) will have, no doubt, influence on banks' investment strategies, in the sense of rethinking the mix of business lines, the preference for risk, a better correlation between target customer needs and products/services' characteristics.

3. Study assumptions and methodology

The process of financial liberalization was one of the factors that boosted banking activity nationally and across borders. The desire for better positioning based on market share and the rapid pace diversification of banking products and services (retail banking, corporate banking, asset management, investment banking, private banking, etc.) created incentives for large financial institutions to adopt a permissive attitude towards taking excessive risks, by focusing on the volume of activities, while relaxing loan granting practices and superficially monitoring the concentration of exposures to a particular customer segment or sector. In order to reduce risk exposure, they have resorted to creating sophisticated financial instruments, the trading of which being assumed to contribute at risk dispersion to other market players.

In this study we aimed to analyze whether the business model practiced by investment banks is more efficient, in terms of maintaining shareholders' satisfaction, than that employed by traditional banks which diversified their activity and provide investment banking services, too. Therefore, we examined the extent to which diversification of financial institutions' activity was reflected in the improvement of performance indicators which are closely related to the degree of shareholders' satisfaction, namely financial return (ROE) and the amount of dividend distributed. We determined a measure of banking efficiency, from the shareholders' viewpoint, by testing, separately, two models corresponding to the two variables of interest specified above. Our analysis focused on individual performances obtained both by pure investment banks and by a number of representative international financial institutions, which have an active investment banking department. Data were taken from the annual financial statements consolidated at group level, covering the period between the years 2001 to 2008.

Efficiency scores were obtained by applying the technique Data Envelopment Analysis – DEA (see Vincova, 2005 and Barr, 2004 for details related to computational aspects). Main arguments in favor of using DEA as a tool to evaluate the performance of financial institutions are:

- allows the testing of multi-input multi-output models;
- > does not require defining a functional relationship between input and output variables;

> estimates are generally not affected by the multicollinearity problem between explanatory variables;

variables can be expressed in different measurement units;

 \succ each institution's performance is compared with that of other institutions in the analyzed sample, allowing the estimation of relative efficiency to the group analyzed and not to a theoretical maximum;

 \succ generates for each inefficient institution a set of benchmark institutions, called "peer group", which include only the efficient ones, which have a structure of input-output variables similar to the inefficient entity analyzed.

It is important to specify the heuristic nature of our scientific approach, which lies in the fact that there is no predetermined, generally agreed structure of the models tested through the DEA method. As a result, we have adapted the components of the model to the specific of the financial institutions considered and to the goals of this study. Also, we mention that the efficiency scores obtained are not a single, generally valid solution, but a satisfactory, credible one for the given context, having an exploratory nature, as it is intended to extract new information existing in the initial set of variables.

We opted to implement a DEA BCC model (Banker, Charnes, Cooper) as it allows the use of variable returns of scale. The mathematical model (considering the hypothesis of a model oriented to maximize results) is:

 $max \theta = \alpha + s + e_{(1)}$

With restrictions:

$$\begin{split} \sum_{k} \mu_{k} \ y_{ik} &= \alpha y_{i0} + s_{i}, \ i = 1, 2, \dots, I(2) \\ \sum_{k} \beta_{k} \ x_{ik} &= x_{j0} - e_{j}, \ j = 1, 2, \dots, J(3) \\ s_{i} &\geq 0, \ i = 1, 2, \dots, I(4) \\ e_{j} &\geq 0, \ j = 1, 2, \dots, J(5) \\ \beta_{k}, \ \mu_{k} &\geq 0, \ k = 1, 2, \dots, n(6) \end{split}$$

Notations:

 θ = the efficiency score for each financial institution considered

n = the number of financial institutions included into analysis

I = the number of output variables considered

J = the number of input variables considered

 μ = the weight attributed to output variables, appropriate to each financial institution

 β = the weight attributed to input variables, appropriate to each financial institution

y = the vector of output variables

x = the vector of input variables

 α = a parameter reflecting the value with which the vector of output variables increases, while maintaining input variables at a relatively constant level

s = parameter that quantifies the deficiencies in obtaining the output variable *i*

e = parameter reflecting the excessive use of input j

In the selection process of input variables we have applied the intermediation approach that takes into account the costs incurred in attracting financial resources (Mester, 2008). The chosen variables are: *total assets, financial assets held for trading, the cost/ income ratio* and *leverage*. Output variables are the *distributed dividend* and *net profit generated by a unit of capital invested*. The models implemented are oriented towards maximizing the results (output oriented in DEA terminology), while maintaining a relatively unchanged level of input variables. We chose this orientation because, to be competitive, a financial institution with cross-border activity must carefully manage its costs, monitor the evolution of solvency and the characteristics of assets held in portfolio.

Regarding the chosen orientation, towards maximizing outputs, it is considered that banking activity is characterized by efficiency if the input-output combination allows the achievement of a financial performance standard, whose efficiency score is equal to 100%. Scores in excess of 100% indicate inefficiency in the optimization of results.

4. The results obtained and their interpretation

In a first step, we calculated the efficiency scores for each financial institution in the sample, under the assumption that the output variable is the dividend distributed. In other words, we show to what extent the amount of dividend distributed to shareholders is justified by the quality of the financial activity undertaken. Allocation of a dividend inconsistent with the institution's financial performance will lead to a state of inefficiency, signalled by a score whose value is higher than the limit of 100%. The graph 1 depicts the time evolution of efficiency scores for the corresponding financial institutions in the sample.



In 2008, four financial institutions (ABN Amro, Deutsche Bank, Lehman Brothers and National Bank of Greece) have proved effective in this regard, achieving a score of 100%. Most inefficient proved to be BNP Paribas, with a score of 2644.4% and ING Bank (1280.87%).

In the year 2007 only two institutions (Deutsche Bank and Goldman Sachs) had a score of 100%, which means that the dividend was properly distributed, according to annual financial results obtained by each of them. However, we noted also the highest inefficiency score recorded for the entire sample of institutions, during the period 2001-2008, of 12169.05% obtained by Lehman Brothers. If we look at the scores obtained by this financial institution we see that during the years 2001-2006 it has been constantly the most inefficient institution, recording values exceeding 3000%, which explains, among other causes, the sudden failure of this investment bank in September 2008. This permanent state of inefficiency can be argued by the aggressive growth strategy practiced on each business line (Capital Markets, Investment Banking and Investment Management). As a result, by 2007, Lehman Brothers reported net income per share and a dividend record.

In 2005 and 2006, in the top of efficient institutions were positioned just Lloyds Banking Group and National Bank of Greece. In each of the years 2004, 2003, 2002 and 2001 a single financial institution has reached a score of 100%, namely National Bank of Greece.

If we analyze the time evolution of the net dividend amount per share, we note that each financial institution considered experienced a progressive increase in the period 2001-2007, followed by an abrupt adjustment in 2008 to a value of 1 euro per share or lower. Although the stated aim of

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the institutions considered was to increase the dividend distributed each year, the high scores obtained (higher than the threshold of 100%) suggest a generalized state of inefficiency. Thus, we can appreciate that the value of the dividend distributed to shareholders was not correlated with changes in financial results or there wasn't an optimal management of available capital.

In a second step, we estimated efficiency scores for each financial institution considered, under the assumption that the output variable is the most significant expression of banking profit, from the shareholders' standpoint, namely the financial return (ROE). It is the main measure of shareholder wealth, reflecting the net profits made by a monetary unit of invested capital.



Chart 2. Efficiency scores (outcome variable - ROE)

Chart 2 shows that efficiency scores for the model whose output variable is ROE, have a more uniform development in time, compared to the ones shown in chart 1, suggesting that the degree of inefficiency, seen against the net profit generated by one unit of capital invested is significantly lower.

In tables 1 and 2 we have illustrated, comparatively, the efficiency scores corresponding to the two models which evaluate, complementary, the two dimensions of shareholders' satisfaction: the return on invested capital and the dividend policy, the last row in each table summarizing the average efficiency scores for the entire eight year period.

							Lloyds	National	
	ABN		Deutsche	Goldman		Lehman	Banking	Bank of	
	AMRO	BNP Paribas	Bank	Sachs	ING Bank	Brothers	Group	Greece	Santander
2001	376,85%	1767,25%	648,31%	276,78%	6679,52%	3006,94%	106,27%	100,00%	464,34%
2002	397,21%	1195,60%	699,62%	337,67%	2639,41%	3595,17%	140,48%	100,00%	280,26%
2003	366,10%	1445,36%	842,79%	237,84%	2137,19%	3630,72%	123,27%	100,00%	422,05%
2004	915,63%	1012,59%	943,00%	196,85%	2404,54%	3096,00%	112,99%	100,00%	687,58%
2005	796,37%	959,42%	826,43%	223,41%	850,54%	3098,70%	100,00%	100,00%	677,96%
2006	722,83%	815,99%	649,80%	103,43%	646,60%	3058,89%	100,00%	100,00%	721,07%
2007	1180,10%	792,99%	100,00%	100,00%	640,38%	12169,05%	399,23%	147,98%	564,21%
2008	100,00%	2644,40%	100,00%	137,48%	1280,87%	100,00%	551,79%	100,00%	220,83%
average	606,89%	1329,20%	601,24%	201,68%	2159,88%	3969,43%	204,25%	106,00%	504,79%

Table 1. Efficiency scores under the assumption of distributed dividend

Table 2. Efficiency scores under the assumption of ROE											
							Lloyds	National			
	ABN	BNP	Deutsche	Goldman	ING	Lehman	Banking	Bank of			
	AMRO	Paribas	Bank	Sachs	Bank	Brothers	Group	Greece	Santander		
2001	134,83%	165,67%	5762,08%	179,27%	349,19%	285,38%	100,00%	100,00%	117,43%		
2002	122,85%	213,92%	2376,49%	224,07%	724,26%	248,91%	120,01%	100,00%	100,00%		
2003	100,00%	198,65%	653,95%	172,95%	326,97%	157,84%	100,00%	100,00%	107,40%		
2004	102,65%	166,28%	334,63%	146,88%	198,20%	163,87%	299,37%	100,00%	121,10%		
2005	127,50%	150,65%	278,65%	143,85%	150,21%	136,21%	100,00%	100,00%	140,56%		
2006	158,09%	143,12%	169,56%	100,00%	175,64%	131,16%	100,00%	100,00%	111,54%		
2007	100,00%	156,96%	153,43%	100,41%	137,08%	198,77%	100,00%	100,00%	100,00%		
2008	146,73%	468,64%	100,00%	379,71%	100,00%	345,23%	185,00%	100,00%	100,00%		
average	124,08%	207,99%	1228,60%	180,89%	270,19%	208,42%	138,05%	100,00%	112,25%		

Table 2. Efficiency scores under the assumption of ROE

For the period under review it can be observed that the National Bank of Greece's activity was characterized by a state of good performance in paying shareholders, recording a rating of 100% for both models tested in 2001, 2002, 2003, 2004, 2005, 2006 and 2008. The implementation of a strategy of rational, balanced market share growth, diversification of lending both to the public and private sector, low concentration of loans in the sectors that have been adversely affected by the global financial crisis are just some of the factors that contributed to achieving and maintaining a good financial performance, reflected in the permanence in time of the state of efficiency in rewarding shareholders.

This performance was achieved in 2005 and 2006 by the Lloyds Banking Group, in 2007 only Goldman Sachs's results were characterized by efficiency, and in 2008 Deutsche Bank has been effective in both the proposed criteria.

If we refer only to efficiency scores from table 2, we note that the number of banks located on the efficiency frontier, as they recorded a score of 100%, is significantly higher than for the model which quantifies the efficiency of the dividend allocation (see table 1). Thus, in 2008, Deutsche Bank, ING Bank, National Bank of Greece and Santander have been optimal in terms of the return on capital, according to financial results obtained. In 2007, five financial institutions have proven to be effective (ABN Amro, Goldman Sachs, Lloyds Banking Group, National Bank of Greece and Santander), three in 2006 (Goldman Sachs, Lloyds Banking Group and National Bank of Greece), two in 2005 (Lloyds Banking Group and National Bank of Greece), two in 2003 (ABN Amro, Lloyds Banking Group and National Bank of Greece), two in 2002 (Santander and National Bank of Greece) and other two in 2001 (Lloyds Banking Group and National Bank of Greece).

If we consider the standard ROE rate of 15-20%, required by international practice, most financial institutions in the sample fall within this range, and even ahead of it. When we integrate this level of ROE in the context of the volume of activity and costs, the results indicate a state of inefficiency for most institutions considered.

This result is supported by the empirical research conducted by Fremerey, Hagen (2010), which show that the growth pace of business, combined with effective management of costs, contribute to a higher ROE.

Conclusions

Nouriel Roubini, renowned professor of economics, which accurately foresaw the magnitude of the current financial crisis, has given a prognosis: in the future, there will be only a few independent business brokers, since the main problem is short-term liquidity. Investment banks will not disappear in the future, but there will be small and specialized institutions such as merchant banks, business advisor, hedge funds, and private equity funds. Investment banks have changed the financial world by the fact that it is the largest deployment that requires a rethinking of their values and a recalibration in terms of their structure.

As regards the empirical results obtained, comparing performance in terms of efficiency, recorded by financial institutions in the sample, we can argue that the two pure investment banks considered (Lehman Brothers and Goldman Sachs), although they were listed as key players in the financial market, which had record levels of net profit and dividend per share, have not correlated the dividend growth rate to the level of capitalization and asset portfolio structure, and hence, they received high scores of inefficiency. Consequently, investment banks have not proved superior to financial groups, which, in addition to performing traditional banking activities, have also, investment banking-type activities, because they failed to maintain a balance between shareholders' rewarding and sustainable expansion of financial activity.

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