GESTÃO, FINANÇAS E CONTABILIDADE

INITIAL PUBLIC OFFERING AND PERFORMANCE OF BRAZILIAN FIRMS

OFERTA PÚBLICA INICIAL DE AÇÕES E DESEMPENHO DE EMPRESAS BRASILEIRAS

OFERTA PÚBLICA INICIAL Y DESEMPEÑO DE LAS EMPRESAS BRASILEÑAS

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ABSTRACT
This paper investigates changes in long-term operational and financial performance for a sample of Brazilian companies made initial public offerings (IPO's) shares, in the period 2002-2008. This period showed a historically high number of IPOs, a heavily discontinued phenomenon with the international financial crisis of 2008. As performance measures were chosen six financial indicators usually adopted in the literature in periods of three years pre-IPO, year of listing and three years post-IPO. The indicators evaluated were size, growth rate, profitability, financial leverage, investment level and investment rate. The results show evidence that, on average, there were statistically significant improvements in size, profitability, investment level and investment rate. But there was no evidence statistically significant changes in the growth rate and financial leverage after the IPO of Brazilian firms.
Keywords: Brazil. Initial Public Offering. IPO. Operating and Financial Performance. Going Public.

RESUMO
Este artigo investiga se ocorreram mudanças no desempenho operacional e financeiro de longo prazo para uma amostra de empresas brasileiras que realizaram Ofertas Públicas Iniciais (IPO´s) de ações, no período 2002-2008. Este período mostrou um número historicamente alto de aberturas de capital, um fenômeno fortemente descontinuado com a crise financeira internacional de 2008. Como medidas de desempenho foram escolhidos seis indicadores contábeis usualmente adotados na literatura, em períodos de três anos pré-IPO, ano da listagem e três anos pós-IPO. Os indicadores avaliados foram tamanho, taxa de crescimento, rentabilidade, alavancagem financeira, nível de investimentos e taxa de investimentos. Os resultados mostram evidências de que, em média, houve melhorias estatisticamente significantes em tamanho, rentabilidade, nível de investimentos e taxa de

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investimentos. Mas, não foram evidenciadas mudanças estatisticamente relevantes na taxa de crescimento e na alavancagem financeira após a abertura de capital de firmas brasileiras.
Palavras-chave: Brasil. Oferta Pública Inicial de Ações. Desempenho Operacional e Financeiro. Abertura de Capital.

RESUMEN
En este trabajo se investiga si los cambios en el rendimiento operacional y financiero a largo plazo para una muestra de empresas brasileñas realizaron ofertas públicas iniciales de acciones (IPOs), en el período 2002-2008. Este periodo mostró un número históricamente alto de IPOs, un fenómeno en gran medida interrumpido con la crisis financiera internacional de 2008. Como se eligieron medidas de desempeño seis indicadores financieros generalmente adoptadas en la literatura en términos de los tres años pre-IPO, años de IPOs y tres años después. Los indicadores evaluados fueron tamaño, tasa de crecimiento, la rentabilidad, la deuda financiera, el nivel de inversión y la tasa de inversión. Los indicadores evaluados fueron tamaño, tasa de crecimiento, la rentabilidad, la deuda financiera, el nivel de inversión y la tasa de inversión. Los resultados muestran evidencia de que, en promedio, hubo mejorías estadísticamente significativas en el tamaño, la rentabilidad, el nivel de inversión y la tasa de inversión. Pero no había pruebas estadísticamente significativos cambios en la tasa de crecimiento y la deuda financiera después de la salida a bolsa de las empresas brasileñas.
Palabras clave: Brasil. La Oferta Pública Inicial de Acciones. Desempeño operativo y financiero. IPO

1. INTRODUCTION

Competition faced by companies brings forth growing organic investments in fixed and intangible capital or investments in acquisitions of other firms. To fund investments, companies rely on internal and external fund flows to make up their capital structure. Permanent internal sources comprise retained profits. External sources entail funds from the usual debt (bank loans, financing, supplier credits and security issuance in capital markets) and/or primary share issuance. The use debt capital, in all their sources mentioned above, is frequently the companies choice. However, this implies fixed financial costs and the possibility of supply restriction on account of, e.g. lack of guarantees and/or high indebtedness. Funds secured from primary share issuance lead to widespread capital holding, but this stands for an alternative which does not ensure fixed return to investors, albeit allowing for distribution of part of the profits, such as dividends and interest on equity. This practice is still seldom in Brazil, if compared to more mature economies. This phenomenon is an open-ended empirical issue. A possible explanation for the lower use of primary share issuances as source of corporate financing may be associated to higher risks faced in the long-run by investors in Brazilian shares, if compared to those in more developed economies.

Several factors influence companies' capital structure and the choice of long-term financing source. Among long-run sources, a company may choose going public and obtain external financing by way of primary share issue in capital markets. Acquisitions of equity funds in the primary market are operated through Initial Public Offering of shares (IPO), the first sale of shares in the market, or through Seasoned Equity Offering (SEO). This article deals with Initial Public Offering of Shares (IPO).

Brealey, Myers, and Allen (2008) point out advantages on going public by way of share issuance. Firstly, share market value becomes the company's performance indicator, allowing for rewarding managers with stock option schemes. Secondly, public information tends of foster funding source diversification, thereby reducing debt costs. Lower financial costs tend to add greater value to

companies. Thirdly, going public renders asset liquidity. Costs associated to going public process (expenses issue and company permanent expenditures with public capital and communication with shareholders/market), may be paid by the added advantages.

The IPO event provides for research lines in finance and accounting, such as: (i) determining factors in going public; (ii) share pricing in market; (iii) review of IPO-originated fund allocation; (iv) company operational and financial performance analysis prior to and following IPO. The present article deals with this last field of study. This area is seldom explored in Brazil and is, in general, geared to short-term analyses based on reduced-time intervals (one or two years after going public). In this field can be cited Bossolani (2009), Biral (2010), and Mello et al. (2010). Based on non-financial company samples, they studied changes to operational and financial indicators following the IPO. Results are not uniform.

Extensive international literature exists which analyzes determining factors in share issuance decisions and capital market performance of companies, which have carried out IPO's. Analyses on operational and financial performance of companies, which have gone public, the focal point of this research, receive less attention. In general, these analyses highlight that share issuances bear mixed effects on these companies' future performance, as per DeGeorge and Zeckbauer (1993), and Jain and Kini (1994) for US companies; Bottazzi and Da Rin (2002) on companies in Germany, France, and Italy; and Chi and Padgett (2006) for Chinese state companies going public.

Go public on the stock market produces long-run changes in the performance of Brazilian companies? How do operational and financial change following going public, as per size, investment, growth, profitability and capital structure? To answer these issues, the article investigates whether there were operational and financial differences, measured by six accounting indicators, between the years following and the years prior to the IPo. These indicators are as follows: size, growth rate, profitability, investment level in fixed assets investment rate in fixed assets as ratio of revenues and financial leverage. These indicators are more usual in international empirical literature for review of performance changes following an IPO, mergers and acquisitions, privatizations or relevant strategic changes, as shown by Jain and Kini (1994), Megginson, Nash, and Randenborgh (1994), Loughran and Ritter (1997), Huang and Song (2005), and Chi and Padgett (2006). The selected sample incorporates only non-financial companies gone public between 2002 and 2008. This period depicts a heated share market, with strong price increment and traded volume trends, that have been discontinued with the 2008 international crisis. The article differs from previous Brazilian works by two points. The first, the sampling period is longer than that of previous periods. The second, it reviews the evolution of accounting indicators in time extensions greater than those adopted in previous researches. Supported by statistical tests, the research records that going public is associated in the long-term to increases in size, profitability, and fixed asset investment (level and revenue ratio). Nonetheless, going public has not been correlated with future changes in growth rate and in indebtedness. These latter evidences contradict a number of previous results found in the literature, as those of Bussolani (2009), for Brazilian companies, and Bottazzi and Da Rin (2002), for European corporations.

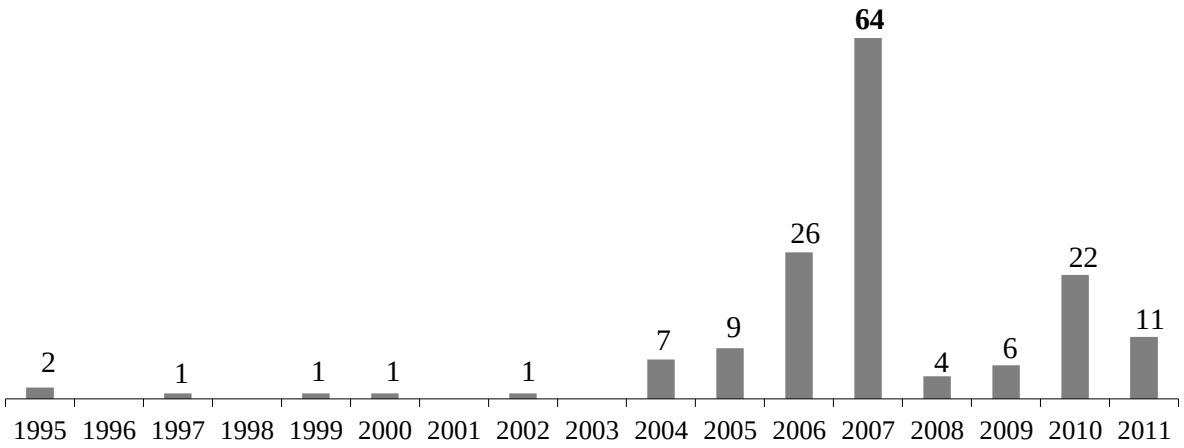
In addition to the Introduction, this article contains five other sections. The second approaches reasons, which have influenced going public, listing evolution at the Brazilian Stock Exchange, and special listing segments. The third bears theoretical and empiric material, aim at exploiting evidences and methodologies used in the literature. The fourth broaches data methodology and description. The fifth brings research results and analysis. The sixth sections contemplates conclusions, limitations, and suggestions for future researches.

2. INITIAL PUBLIC OFFERING OF SHARES IN BRAZIL

IPO's are carried out by way of primary share distribution (Primary Public Offering or primary issuance), secondary distribution (Secondary Public Offering or secondary issuance), or the combinations of the two issuances (Mixed Offering). A Primary Public Offering entails the issuance of new shares by capital stock increase operation, with new fund inflow into the company and increase in shareholder base. A Secondary Public Offering sells existing shares. The proceeds of share sales in this second issuance belong to the selling shareholders.

For a company to trade shares at a stock exchange or at an organized over-the-counter market, it is first necessary to secure a Public Company registration with the Brazilian Securities and Exchange Commission (CVM). According to BM&FBovespa (2011), 155 companies went public between 1995 and 2011 in the Brazilian market. Six going public operations were recorded between 1995 and 2003, a weak period for prices and volumes in the share market; 149 firms carried out IPO's between 2004 and 2011. Figure 1 shows that the Brazilian going public market was very heated in the 2004-2008 subperiod (106 going public operations). Stock market peak in listings occurred in the year of 2007 (64 IPO's), totaling a financial volume of R$ 55.6 billion (Figure 2). This significant issuance growth was interrupted in 2008 (during which only four firms went public) on account of the international financial crisis.

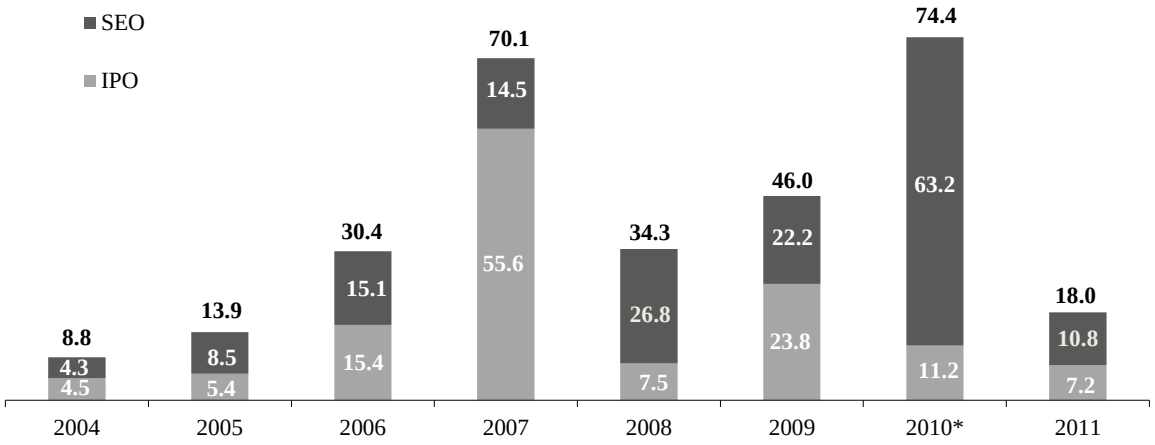
Figure 1- Number of Initial Public Offerings in Brazil



Source: BM&FBovespa (2010 and 2011)
Elaboration: Authors

BM&FBovespa (2012) attributed listing increase after 2004 to Brazilian economy improvement, the strong international liquidity, legislation reform (the Lei das S.A./Corporate Law, Law 6,404/76 revised through Laws 10,303/01 and 11,638/07), and the creation, in 2000, of differentiated corporate governance levels (greater transparency and investor security).

Figure 2 – Volume of Public Offerings in Brazil: IPO´s and SEO´s (in billions of R$)



Note: * excluding Petrobras capitalization.
Source: BM&FBovespa (2012)

Public Offering of shares financial flow, notwithstanding Petrobras R$ 120 billion capitalization in 2010 (SEO), also displayed relevant rise along the heated market phase (Table 1). As GDP proportion, new share placement (IPO and SEO) reached an average of 1.12% in the 2002-2011 decade. Yet, the annual issuance level is very volatile (standard deviation of 0.81%), reaching 0.41% in 2002, a maximum of 2.63% in 2007, and 0.43% in 2011.

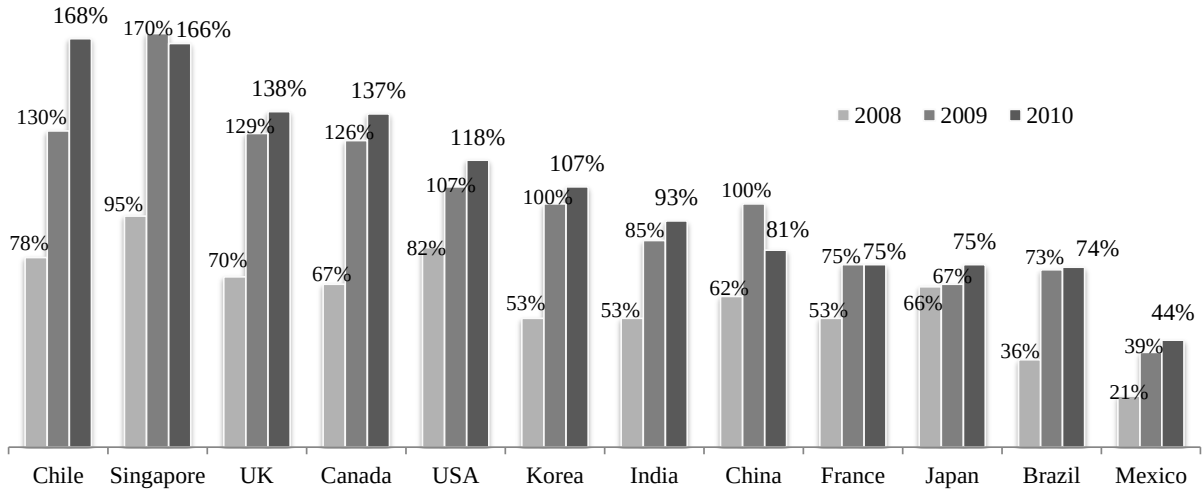
Table 1 – Evolution of Public Offerings: 2002-2011

Years	Number Offers	Volume Offerings (R$ billion)	GDP (R$billion)	% GDP
2002	5	6.10	1,477.8	0.41
2003	6	2.70	1,699.9	0.16
2004	15	8.80	1,941.5	0.45
2005	19	13.94	2,147.2	0.65
2006	42	30.40	2,369.5	1.28
2007	**76**	**70.10**	**2,661.3**	**2.63**
2008	12	34.30	3,032.2	1.13
2009	24	46.00	3,239.4	1.42
2010	22	74.40	3,770.1	1.97
2011	22	18.00	4,143.0	0.43
Average				1.12
Standard Deviation				0.81
Variance Coefficient				0.72

Source: BM&FBovespa and BACEN Primary Data.
Elaboration: Authors.

The rise in the number of listed companies has contributed to an increase in market capitalization. However, the ratio between market capitalization stock and the GDP shows that the relative size of the Brazilian stock market is lower than that of several economies, including those of emerging countries (Figure 3).

Figure 3– Market Capitalization x GDP: Brazil and Selected Countries



Source: BVM&FBovespa (2012)

In December/2000, BM&FBovespa structured special share listing segments (Novo Mercado/New Market, Level 1 and Level 2), meant for companies committed with the voluntary adoption of high corporate governance standards. Implemented in 2002, the special segments resulted from the need for improving corporate governance, aiming at bestowing greater transparency to issuers, rendering of accounts, equitable treatment among shareholders, and lower risk perception by investors. As illustrated by evidence from Gompers, Ishii, and Metrick (2003), it is expected that this improvement in governance positively affect share liquidity and price and, consequently, decrease share capital cost. Since then, the majority of Brazilian companies which have gone public, adhered to differentiated corporate governance levels (BM&FBOVESPA, 2012).

3. RELATED LITERATURE

This section presents theoretical and empirical, highlighting interpretations by authors who have analyzed the operational and/or financial performance evolution of companies following share issuance.

3.1. INTERNATIONAL LITERATURE

Degorge and Zeckhauser (1993), have researched 62 North American companies subject to leveraged buyouts (LBO's), which returned to the market (1983-1987) via reverse LBO's. They reviewed indicators from 1 year prior and up to 2 years following IPO. They evinced that an IPO coincides with an operational performance peak and that, in average, pre-IPO, company operational profit displayed greater growth than total assets. Following the IPO, company performance worsens in comparison with private companies and with pre-IPO performance itself. Two explanations exist for this. Firstly, information asymmetry between managers and investors and/or result management. Secondly, it is more probable that companies with good previous performance try to go public than companies with weak performance.

Jain and Kini (1994) analyzed the performance of 682 North American companies, which went public (1976-1988). They used two indicators: (i) return over assets (ROA) and (II) operational/assets cash flows. They reviewed one year prior to IPO against: the Offering year itself and one, two, and three years later. The authors found worsening in post-IPO performance, before and after industry adjustment. Performance deterioration cannot be

attributed to lack of sales growth opportunities, or to investment cuts following IPO, as these variables displayed major growth in this period. They have also evinced decreases in the post-IPO periods in market price/book value, price/profit ratios, and profit per share.

Jain and Kini (1994) suggest explanations for this evidence, as follows: increase in agency costs under the new public company condition; earnings management possibility; opportunistic firms go public in high earnings time, where high earnings will not recurrent. Information asymmetry and conflicts of interest would be common factors to the three assumptions. The authors suggest that new share offerings foresee weak performance following issuance.

Loughran and Ritter (1997) related share return of corporations that carried out SEO's to operational performance. They researched 138 North American companies (1979-1989). They ascertained that operational performance was higher in the period when a SEO carried out. They have found out lower performance following offering. The fall was higher in analyses against companies without share issuances. Weak operational performance reflected in low share return following issuance, with greater impact in smaller companies. They highlight that, upon offering, multiples do not reflect performance deterioration expectation (overvalued shares). In years in which few companies are overvalued, there is a reduced number of issuances (SEO's and IPO's). The opposite occurs when several shares are overvalued: a great number of shares, which precede weak operational performance and low share return.

Pagano et al. (1998) analyze IPO determinants in a sample of 69 Italian companies (1982-1992). They analyzed indicator evolution in the going-public years and up to three years following listing. Research indicated that IPO probability increases when sector shares have high prices. This result is not exclusive to the sample used and was documented in other countries. The research suggests that companies do not issue shares to finance future investments and growth, but rather to rebalance balances following periods of high investments and growth. Pagano et al. (1998) found evidence that issuances provide for lower post-IPO credit costs related to information improvements.

Bottazzi and Da Rin (2002) researched the performance of 538 listed companies (1996-2001) in the New Market (NM) at European Stock Exchanges: Neuer Markt (Frankfurt), Noveau Marche (Paris), and Nuovo Mercato (Milan). The European New Markets were created to attract only high technology, strong growth companies. Particularly the German Neuer Markt was the inspiration for the Brazilian NM good governance rules, which may attract any type of company (SILVA, 2005). The authors analyzed the results two years prior and two years after IPO for financial and non-financial indicators. For the authors, companies adhering to NM tend to be younger, are smaller than those in the traditional segment, display higher growth, and exhibit high investment in R&D. They are also very leveraged and find strong credit restrictions. This possibility is also supported by increases in post-IPO debt and in disbursements with R&D. They concluded that post-IPO companies rebalance their indebtedness and growth, but become less profitable.

The Chinese market was studied by Chi and Padgett (2006), who researched the operational performance of companies carrying out IPO's and their relationship with share returns in the short and in the long run. They investigated 382 Chinese state-owned companies listed in the stock market (1996-1997) by way of accounting indicator analysis. Firstly, they compared performance differences three years prior with three years following listing. They found out that listing brings about significant falls in profitability, sales growth, asset shifting and financial leverage. Secondly, they evinced that IPO underpricing does not have the power to forecast operating performance post-going public, a result consistent with

evidence from Jain and Kini (1994) for the United States. Lastly, they studied the ratio between post-IPO performance and share long term returns. Return on assets, size, sales growth, asset shift and financial leverage are positively related to share long term returns. They conclude that, due to post-IPO performance deterioration, are necessary advances in governance for corporate development improvement and capital market development.

3.2. BRAZILIAN LITERATURE

Bossolani (2009) researched company profitability and growth post-IPO, and estimated regression models for their determiners. He states that this is the first Brazilian research in the field. Analysis was made of 36 non-financial IPO's (2004-2006). The evidence suggests that, prior to IPO's, companies grew and expanded revenues and assets on account of investments. This has left companies excessively leveraged with credit restrictions. Following the IPO, companies use primary offering funds to increase investments, accelerate growth and reduce indebtedness. Thus, they were able to keep post-IPO profitability. Additionally, they start facing lower credit restriction, as they benefit from equity increase stemming primary offering funds.

A study of bank IPO's (2005-2007) was done by Schiozer et al. (2010). The authors used variables of capital adequacy, asset quality, management quality, profits, and asset liquidity as performance indicators. Those who carried out IPOs presented ex-ante characteristics diverse from peers (private companies) of the same size and type of activity. The banks recorded, ex-ante, greater profitability, greater loans/assets ratio, lower default rate, and more limited capital in comparison with peers. They concluded that the IPO wave is not explained by the Market Timing Theory, but rather by growth opportunities and capital needs in relation to competitors. They pointed out that market liquidity is a necessary, but not sufficient condition, to explain IPO's. By investigating post-IPO operational performance, the authors evinced growth in the loans/asset ratio, attributed to default increase. In addition, they detected improvement in operational efficiency by economies of scale.

Wardil (2009) analyzed IPO impact on company performance, comparing accounting indicators ex-ante versus ex-post going public. The sample consisted of 93 companies (2004-2007). The study found statistically that, in average, profitabilities and revenues displayed significant post-IPO increase. Moreover, he suggested that capitalization increase (92% of companies opted for primary or mixed offerings) have enabled operational asset investment growth and indebtedness fall. However, econometric tests were not able to support the assumption that changes to these indicators had been brought about by the IPO.

Biral's research (2010) reviewed performance of firms which went public (2004-2008), through the analysis of traditional profitabilities (assets and net equity), EBITDA/Assets, FCL/Assets, financial leverage and growth (revenues and assets). According to the author, hitherto, only two works had studied the theme in Brazil: Schiozer et al. (2009), and Bossolani (2009). Biral emphasized that he enlarged these latter authors' analysis by: (i) a broader sample; (ii) a peer methodology to mitigate the influence of exogenous changes homogeneously affecting performance of companies in a sector. The sample excluded financial institutions, companies with mergers/acquisitions and firms without comparable peers. The final sample bore 69 companies. Results indicated that, ex-ante, companies which went public displayed profitability greater than that of companies in the control group. This difference remained following the IPO. These companies were more in debt and grew more than their peers, prior and post-IPO, but there occurred no changes to future profitability. He suggests two possible explanations. Firstly, operational performance does not vary with an IPO, contradicting most international evidence. At this point, he agrees with Bossolani

(2009), that the companies use offering funds to increase investments and accelerate asset and revenue growth. Secondly, there are data limitations. A number of variables suggest worsening in post-IPO performance, according to international research. However, these evidences were not statistically significant.

Mello et al. (2010) evaluated accounting indicator evolution for 62 IPO's (between 2004 and 2007). As indicators, they elected profitability, margin, structure, liquidity, and activity. As from the viewpoint that companies going public seek to improve risk, profitability, capital structure, and/or growth expediting, the authors have tested the change assumption to post-IPO indicators regarding the previous period. This research found out that financial and liquidity dependence displayed post-IPO improvement. Net margin and fixed asset shift did not present significant changes. Following IPO, net revenues displayed increase, whereas there occurred an economically relevant drop in profitability. The authors suggest that decrease in immediate profitability may reflect a long investment maturity term. In addition, they believe that part of this worsening may have originated in the 2008 worldwide financial crisis, which affected profits from the vast majority of companies (more than half of sample companies had gone public in 2007).

Aldrighi's (2010) aim was to identify going public determiners (between 2002 and 2008) and review changes to size, investments, sales growth, profitability, degree of indebtedness, and sector of activity. He also researched IPO format choices: primary offering parcel in offering total, listing segment, major shareholder's stake in voting capital, and free float. He also analyzed the relevance of international liquidity to the IPO wave, and the role of foreign investors. Some evidences are highlighted. First, portfolio diversification was not an IPO motivation, thereby not confirming discontinuity expectancy in ownership concentration and of capital control. Second, in average, a drop occurred in post-IPO. Third, financial restructuring does not seem to be a reason for IPO's. Fourth, major, more lucrative companies, with higher investments and which grow more, bear greater probability of carrying out IPO's. Fifth, favorable conditions in the international capital market have contributed to an IPO wave between 2004 and 2007. Sixth, there occur underpricing in IPO's and indications (without statistical relevance) of market timing in IPO's.

Prior empirical evidence demonstrates that post-IPO company performances are not uniform, thereby rendering an empirical issue still open-ended. Particularly, in the Brazilian case, research on the theme is recent and small in number. Additional evidence is important to strengthen literature in the field.

4. METHODOLOGY

Research is quantitative and descriptive. It investigates changes to operational and financial performance of Brazilian companies that went public and listed their shares in the stock market. The study reviews long-term evolution for six selected economic and financial indicators, herein called performance measures. The aim is to review whether a statistically significant performance difference exists at post-IPO in comparison with pre-IPO performance.

4.1 SAMPLE, DATA SOURCES AND SELECTED INDICATORS

The final sample involved 47 firms in the 2002-2008, extracted among 112 firms which carried out IPO's between 2000 and 2008 (39 primary issuances, 10 secondary issuances, and 63 mixed issuances. This period incorporates the beginning and end of the going public cycle in the Brazilian market. The following companies were excluded from the population of 112 firms going public: a) eighteen financial companies; b) twelve firms with

mergers, acquisitions and capital closing; seven foreign companies and which issued Brazilian Depositary Receipts (BDR's); five pre-operational companies; fifteen companies without pre-IPO information audited or which Auditors' Report contained remarks or limited review; eight companies with external indicators (outliers). New Market listed companies represent 84% of the sample. The others adopted listings in other differentiated BM&FBovespa Corporate Governance segments.

Research has adopted accounting proxies for performance measurement. Performance measures were estimated along a seven-year time window: three years pre-IPO, IPO year, and three years post-stock market listing. Indicator selection is supported by researches of Jain and Kini (1994), Megginson, Nash, and Randenborgh (1994), Loughran and Ritter (1997), Huang and Song (2005), Chi and Padgett (2006), and Bossolani (2009).

Data used relating to the three-year pre-IPO period was acquired through Balance Statements, Annual Financial Statements, and Definite Prospects from operation. This information came from the CVM (Brazilian regulator of Capital Market), BM&FBovespa, issuing companies and financial institutional coordinating the Offering. For post-IPO performance analysis, we have considered data from the Economatica Database and from company Standard Financial Statements. The inflation rate adopted (IPCA) was acquired from IBGE.

This article has adopted six accounting proxies to measure company operational and financial performance. As shown in Table 2, the indicators are as follows: Size, Growth, Profitability, Financial Leverage, Investments, and Investment Rate.

Table 2 – Operational and Financial Performance Variables

Variables	Description	Expected Results
Size	Natural Log Real Sales	$\ln ROL_D > \ln ROL_A$
Growth	Growth ln Real Sales	$\Delta ROL_D < \Delta ROL_A$
Profitability	ROS = Net Income/Sales	$ROS_D > ROS_A$
Financial Leverage	[Gross debt/(Equity+Gross Debt)]+1	$Leverage_D < Leverage_A$
Investment Level	Natural Log Real Capex	$\ln Capex_D > \ln Capex_A$
Investment Rate	Capex/Sales	$Capex\,Rate_D > Capex\,Rate_A$

Note: D and A notations mean following IPO and pre-IPO, respectively

- SIZE: natural logarithm (ln) of real sales (ROL) was used, the usual proxy for company size. Nominal measure was deflated by IPCA, IBGE's inflation index, for 2011 prices. Total assets or net equity such as size measurements are limited alternatives for reviewing companies with IPO processes. According to Wei et al. (2003), on account of new funds in the company by way of primary issuance, there occurs an expansion of assets and net equity, thereby hindering comparative analysis of these variables in time. According to the literature, the companies need funds to invest and grow, so that size increase post-IPO is expected.
- GROWTH: bears as proxy the annual variation of natural logarithm sales. It was not possible, only for this variable, to obtain results for the seven-year period, as most companies only render available accounting information for three years pre-IPO. Thus, it was only possible to estimate growth for two years pre-IPO. According to the literature, in general, growth rate post-IPO is positive, but decreases regarding the pre-IPO period.
- PROFITABILITY: most research used ROE and ROA as profitability measures, as suggested by Loughran and Ritter (1997), Bussolani (2009), Wardil (2009), and Biral

(2010). However, Wei et al. (2003) do not consider them as good metrics when new capital inflow occurs, as net equity and assets increase, thereby raising denominators of these indexes. They suggest that ROS (Return on sales or net margin) comprises the most appropriate guideline to measure profitability where primary share issuance occurs. This indicator was measured by the net income/sales ratio. An increase in post-IPO profitability is expected.

- FINANCIAL LEVERAGE: to avoid problems with companies which displayed negative equity and/or did not possess debts, this variable was estimated as: [Gross debt/(Equity+Gross Debt)]+1, in which gross debt refers to gross burdensome indebtedness. This measurement indicates how a company finances its activities. We expect that the indicator decreases following going public.
- INVESTMENT LEVEL: considered a good indicator to evaluate company business expansion and it was measured as natural logarithm (ln) of Capex (Capital Expenditures). Nominal Capex was deflated by IPCA to eliminate the inflationary effect. We expect that the investment level increase post-IPO.
- INVESTMENT RATE: a variable measured by Capex/ROL ratio. The assumption is that IPO primary funds are directed to growth and raise investment in net operational revenue. We expect an increase in this indicator.

4.2 ANALYSIS OF INDICATOR CHANGES FOLLOWING IPO's

Descriptive statistics are drawn up in a first stage, taking into account performance three years pre-IPO (named pre-IPO or "t-3"), IPO year and three years post-IPO (named post-IPO or "t+3"). At a second stage, parametric and non-parametric tests are carried out to infer whether average indicator behavior is different between pre-IPO and post-IPO periods. According to Fávero et al. (2009), parametric tests ascertain suppositions on populational parameters, such as average, variance, and distribution normality. Normality is determined by the Kolmogorov-Smirnov test. Variance homogeneity is examined by the Levene test. The Student test determine statistical significance of performance average differences. Table 3 presents the assumptions of parametric tests used in this research.

Table 3 – Assumptions formulated for Parametric Tests

Tests	**Assumptions Formulated**	**P-Value**
K-S	H_0: data distribution is normal	> α: Ho is accepted, thus concluding that distribution is Normal
	H_1: data distribution is not normal	< α: Ho is rejected, thus concluding that distribution is not Normal
Levene	H_0: variances are homogeneous	> α: Ho is accepted, thus concluding that variances are homogenous
	H_1: variances are not homogeneous	< α: Ho is rejected, thus concluding that variances are not homogenous
t Test	H_0: population averages are equal	< α: Ho is rejected, concluding that averages are not equal
	H_1: population average are not equal	> α: Ho is accepted, thus concluding that average are equal

Note: K-S –Kolmogorov-Smirnov Test

Assumptions on performance indicator differences are as follows:

- Null Hypothesis (HO): no difference exists between the groups analyzed (averages prior and post-IPO).

$$H_0: \overline{I_D} = \overline{I_A} \rightarrow H_0: \overline{I_D} - \overline{I_A} = 0$$

Where:
$\overline{I_D}$ = Indicator average post IPO and $\overline{I_A}$ = Indicator average prior IPO

- Alternative Hypothesis (H1): difference exists between groups analyzed

$$H_1: \overline{I_D} \neq \overline{I_A} \Rightarrow H_0: \overline{I_D} - \overline{I_A} \neq 0$$

Non-parametric tests will performed in addition to the parametric tests, to confirm parametric results or whether the assumptions for *Student t* test are being complied with. In this context, the *Wilcoxon* test will evaluate significance of performance average differences.

5 RESULTS AND ANALYSES

Table 4 presents descriptive statistics for the seven years. Indicator change analysis will be concentrated in comparisons of extremes: t-3 and t-2 versus t+3. Two reasons exist for this option: (i) focus on long term performance; (ii) reduce the possibility that performance in the year pre-IPO (t-1) and of the two following years (t+1 and t+2) being influenced by restructurings and balance adjustments aiming to raise company pricing. According to Teoh, Welch, and Wong (1998) companies possess incentives to manage results reported in relation to actual cash flow, aiming at increasing share price upon going public.

Table 4 – Descriptive Statistics

Final Sample	t-3	t-2	t-1	t	t+1	t+2	t+3
N (Valid)	47	47	47	47	47	47	47
Size							
. Average	12,4	12,7	13,0	13,3	13,7	13,9	14,1
. Median	12,3	12,7	13,0	13,4	13,7	13,9	14,0
. Standard Deviation	1,2	1,2	1,2	1,1	1,1	1,1	1,2
Growth Rate							
. Average	ND	0,25	0,30	0,34	0,37	0,24	0,22
. Median	ND	0,22	0,21	0,27	0,33	0,21	0,18
. Standard Deviation	ND	0,20	0,25	0,28	0,34	0,21	0,19
Profitability							
. Average	4,7	5,8	6,2	3,2	6,6	7,6	8,6
. Median	4,7	4,5	5,6	3,3	7,9	7,9	8,3
. Standard Deviation	10,8	9,1	11,2	13,5	10,4	9,4	9,8
Financial Leverage							
. Average	1,41	1,42	1,40	1,25	1,31	1,35	1,38
. Median	1,36	1,40	1,37	1,24	1,31	1,37	1,43
. Standard Deviation	0,29	0,28	0,28	0,20	0,23	0,20	0,21
Investment Level							
. Average	9,3	9,2	10,1	11,3	11,6	11,4	11,7
. Median	9,9	9,5	10,1	11,5	11,9	11,4	11,8
. Standard Deviation	2,2	2,5	2,1	1,7	1,6	1,9	1,7
Investment Rate							
. Average	10,7	11,2	21,5	29,9	27,1	22,0	18,8
. Median	6,3	4,0	5,4	18,8	16,7	7,8	11,3
. Standard Deviation	12,5	17,8	58,0	35,7	34,7	29,1	20,6

NOTES: N - number of cases researched. Size - natural log of Real Sales. Growth Rate - natural log of Real Sales variation. Profitability - ROS (Net Income per sales ratio). Financial Leverage – measured as (Gross Debt/Gross Debt + Equity) + 1. Investment Level - natural log of Investment. Investment Rate - investment and Sales ratio. ND - Not Available. t-3 (3 years pre-IPO); t-2 (2 years pre-IPO); t-1 (1 year pre-IPO); t (IPO year); t+1 (1 year post-IPO); t+2 (2 years post- PO) and t+3 (3 years post-IPO).

Average coefficients relating to the post-IPO period (t+3) versus pre-IPO (t-3 and t-2), suggest arithmetic growth of the size, profitability, investment level, and investment rate and declining growth rate and financial leverage. Standard deviation remained stable in the size and growth rate, and displayed increase in investment rate. Profitability, financial leverage and investment level indicators have displayed decreases in post-IPO dispersion. Statistical tests for average differences between the indicators posted on Table 5 (parametric tests) and on Table 6 (non-parametric tests) evaluated whether changes ascertained in performance have presented statistical significance.

Table 5 – Parametric Tests

VARIABLES	K-S			Levene		test t	
	t-3	t-2	t+3	t+3 & t-3	t+3 & t-2	t+3 & t-3	t+3 & t-2
N (valid)	47	47	47	1 (df1)	1 (df1)	47	47
				92 (df2)	92 (df2)		
Size	0,082	0,087	0,085	1,100	0,641	-14,234	-13,290
	(0,20)	*(0,20)*	*(0,20)*	*(0,30)*	*(0,43)*	*(0,00)*	*(0,00)*
Growth Rate	ND	0,140	0,138	ND	0,161	ND	0,684
	ND	*(0,02)*	*(0,03)*	ND	*(0,69)*	ND	*(0,50)*
Profitability	0,129	0,154	0,150	0,594	0,009	-2,417	-1,793
	(0,05)	*(0,01)*	*(0,01)*	*(0,44)*	*(0,93)*	*(0,02)*	*(0,08)*
Financial Leverage	0,110	0,098	0,119	7,857	3,734	0,703	0,968
	(0,20)	*(0,20)*	*(0,09)*	*(0,01)*	*(0,06)*	*(0,49)*	*(0,34)*
Investment Level	0,109	0,070	0,089	2,649	4,582	-11,007	-8,891
	(0,20)	*(0,20)*	*(0,20)*	*(0,11)*	*(0,03)*	*(0,00)*	*(0,00)*
Investment Rate	0,195	0,276	0,186	(a)	(a)	(a)	(a)
	(0,00)	*(0,00)*	*(0,00)*	(a)	(a)	(a)	(a)

NOTES: ND - Not Available. K-S - Kolmogorov-Smirnov test to determine whether variables bear normal distribution (p-value between parentheses, and α = 1%). Levene test to evaluate variance homogeneity in cases where distribution is normal (p-value between parentheses and α = 1%). "t" Test to determine whether prior and post-IPO samples are significantly different (p-value between parentheses and α = 1%) when normality and homogeneity assumptions have been met t-3 (3 years pre-IPO). t-2 (2 years pre-IPO) and t+3 (3 years post-IPO; (a) tests were not calculated as normality assumptions were not met.

Table 6 – Non-Parametric Tests

	Non-Parametric Test (Wilcoxon)		
Variables	**Period**	***Z-statistics***	***p-value***
Size	t+3/t-3	-5,96	*0,000*
	t+3/t-2	-5,96	*0,000*
Growth Rate	t+3/t-2	-0,63	*0,529*
Profitability	t+3/t-3	-2,24	*0,025*
	t+3/t-2	-1,69	*0,090*
Financial	t+3/t-3	-0,65	*0,516*
	t+3/t-2	-1,13	*0,258*
Investment Level	t+3/t-3	-5,92	*0,000*
	t+3/t-2	-5,92	*0,000*
Investment Rate	t+3/t-3	-3,52	*0,000*
	t+3/t-2	-3,24	*0,001*

Notes: the *Wilcoxon Test* was used for comparing the two populational average (pre and post -IPO).

Size (Actual ROL ln) has evolved from 12.4 (t-3) and 12.7 (t-2) to 14.1 (t+3). This performance change was statistically significant in parametric and non-parametric tests, to a 1% significance level, thereby pointing out that Brazilian companies have speeded up post-IPO growth, as expected. This result is similar to that found in international literature by Jain and Kini (1994) and Chi and Padgett (2006), and in Brazilian literature by Bossolani (2009) and Wardil (2009). According to Bossolani, companies need external funds to increase investments and growth.

Profitability displayed levels of 4.7% (t-3) and 5.8% (t-2). Following IPO, it reached 8.6%. Conversely, standard deviation decreased from 10.8% to 9.8%. Statistical significance (parametric test and non-parametric test was determined at a 5% level when comparing change in return in t+3 versus t-3. Profitability improvement following listing may have been influenced by revenue increase, indebtedness decrease (primary offering), and lower acquisition costs. In this sense, Pagano et al. (1998) have found evidence that issuances provide for lower credit cost and greater post-IPO business volume control, possibly on account of information improvements when a firm go public. Bossolani (2009) suggests that lower leverage has allowed for financial expense decrease in Brazilian companies and profitability upkeep post-IPO.

The investment level has recorded growth following IPO: from 9.3 (t-3) and 9.2 (t-2) to 11.7 (t+3), whereas standard deviation displayed decrease. Change to investments was statistically significant at the level of 1%, in parametric and non-parametric tests. The same evidence of increase in the post-IPO investment threshold was ascertained in Brazilian works by Bossolani (2009) and Wardil (2009), stressing that the funds stemming from primary share offering were directed to new investments.

Investment rate was measured by the Capex and Operational ratio. Increased expectation of its average coefficient post-IPO was confirmed: from 10.7% (t-3) and 11.2% (t-2) to 18.8%, as well as a significant dispersal increase being also ascertained. Performance change was statistically significant at a 1% level only for the non-parametric test. This result was similar to that found by Bossolani (2009) and Wardil (2009), thus indicating that the funds acquired in Brazilian company primary share offerings have provided a greater investment threshold as to post-IPO sales.

Although bearing arithmetic changes commensurate with the expectations, two indicators do not display changes statistically different from zero. Growth rate depicts an apparent post-IPO decrease (t-2= 25%; t+3= 22%). It is also relevant to point out that standard deviation, albeit similar in extreme years, is unstable in years close to an IPO. This result contrasts with growth increase evidence shown in the reviewed literature. Financial leverage indexes signal a slight fall in the post-IPO period (t+3= 1.38), vis-à-vis pre-IPO periods: 1.41 (t-3) and 1.42 (t-2). A strong dispersion decrease also occurred (standard deviation decreased from 0.29 in t-3 to 0.21 in t+3). However, the change in average indebtedness was not statistically diverse from zero. A result opposite to that shown by Bossolani (2009) for Brazilian companies, and Bottazzi and Da Rin (2002) for European companies, which research has shown decrease in indebtedness following going public.

In general, significant results suggest, in average, a number of interesting syntheses to analysts and investors. First, going public implied in an increase in company size and in absolute and relative investment volume in the three years following the event, despite part of the issues comprising secondary issuances. Second, there is an increment in book profitability

between the third year pre-IPO and the third year following the event. Third, no decrease in company financial leverage post-IPO. That is, the research sample suggests that share issuance funds are not used to reduce indebtedness. Fourth, a slight arithmetical fall in the growth rate occurs, although without statistical relevance.

These last two results are very relevant to the theme. Share issuances have not been used to decrease indebtedness, unlike what previous evidence from the literature suggests. At the same time, in the sample studied, going public has proven to be a company growth rate increase strategy. There are indications that going public is a manner of sanctioning a growth threshold, not raising it.

6 CONCLUSIONS

This research has investigated long term changes to operational and financial performances of Brazilian companies which have carried out IPO's (going public) between 2000 and 2008, and have listed their shares with BM&FBovespa. This period has displayed great increase in share prices and great going public activity, phenomena which were reversed by the 2008 financial crisis of 2008. Six performance measures were selected among the indicators extracted from financial statements. The final sample was comprised of 47 firms. A seven-year time window around the listing was segmented into three periods: three years prior to listing year, IPO year, and three years following listing year. In the long term, the time gap between three years post-IPO and three years or two years pre-IPO.

Research scope diverged from prior studies. First, the sample used contains companies, which carried out IPO's between 2000 and 2008, a period greater than those researched by the accessed literature. Second, focus on company long term performance, comparing performances in longer periods (three years or two years pre-IPO versus three years post-IPO), so as to prevent that annual indicators close to the IPO year from being contaminated by the going public environment. Third, we have adopted performance measurements estimated through data from updated financial statements, taking into account reclassifications, audits, and devoid of remarks.

Results from most part of the literature researched have pointed out a worsening of operational performance and decrease in company financial leverage in the short term (one or two years), following listing before the Stock Exchange. This article, which sought to examine indicators three years post-IPO, in comparison with three or two years prior to the IPO, has found evidences of improvement of part of the operational and financial indicators adopted to measure Brazilian company performance, this result being akin to that of Megginson *et al.* (1994, apud CHI AND PADGETT, 2006).

Through parametric tests, evidences have shown increase in post-IPO *versus* pre-IPO performance concerning three indicators: size (ln of actual net operational revenue), investment level (ln of actual capex), and profitability (return over sales). By applying Wilcoxson's non-parametric test, investment rate increase capex over net operational revenue) was also statistically inferred. These results suggest that companies have used funds stemming from primary share offering to raise investments and increase sales, with scale gains. Post-IPO growth of the size and investment level variables ratifies evidence documented by Chi and Padgett (2006) in international literature, and by Bossolani (2009) and Wardil (2009) for the Brazilian cases. Bossolani (2009) concluded that Brazilian companies, just like the European, needed funds to invest and promote their growth. However, this only allowed for keeping the profitability rate of its sample, a result different from profitability growth shown in our research.

Literature suggests that primary offering funds are used to decrease debt, aiming at a lower credit restriction and decrease in acquisition costs and, consequently, leading to lower financial expenses. Pagano et at. (1998) documented international evidence that issuances confer lower credit cost and greater control of post-IPO business volume, attributing this scenario to a decrease in information asymmetry, as the company became public. Bossolani (2009) ascertained that, prior an IPO, Brazilian companies were more leveraged, highlighting a credit-scarce environment. He concludes that lower indebtedness occurs post-IPO, allowing for decrease in financial expenses and profitability upkeep following going public. However, in our study, no statistical evidence was found that financial leverage is different prior and post IPO. Likewise, there was no statistical evidence that the change in growth (actual net operational revenue growth rate) is different from zero.

This research bears limitations that may be faced in future studies. First, we point out the difficulty in obtaining information on companies listed prior to 2000. This has restricted the period of analysis and the sample used. Second, we have not adopted comparative analysis with similar companies. Going public in the years studied has incorporated new sectors in the share market, these comprising cases in which it has not been possible to form comparable plans. Third, there occurred accounting changes in the period analyzed. Brazil altered its Public Company legislation by means of Laws 11638/2007 and 11941/2009, and adopting convergences to international accounting practices and standards (IFRS). In order to minimize the impact by the new rules, we analyzed companies' Financial Statements to adjust possible differences between indicators produced by various accounting standards. However, it is not possible to ascertain that indicator historical series will be homogeneous throughout time.

Finally, it is important to stress a number of suggestions for future research. First, investigate performance differences between public companies and comparable companies. Second, enlarge the sample researched and the period of analysis, by incorporating high and low cycles in the share market, and increasing the long-term measure adopted. Third, test models that empirically examine the determinants for changes to the analyzed indicators. Fourth, review performance post-going public for shares in the stock market.

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