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Abstract

This paper relates to the initial public offering problem and companies' profitability levels before and after this event. In the presented study, profitability ratios in the year before initial public offering increase over the previous year, and then, after the IPO, fall. This confirms the phenomenon of distorting the level of profit before the IPO and partially equity dilution after the IPO.

Keywords: IPO, capital market, corporate finance, ROE, ROA, window dressing

JEL Classification: G14, G15, G32

1. Introduction

Initial public offering (IPO) is an important moment in a company's development process, and the owners are guided by different motives when deciding to start public trading of shares. Exchange can be a source of capital and prestige. Whatever the motives, the decision always has an impact on further action: financial, accounting and operational ones taken by the managers and owners before the first public offering. These activities are usually aimed at maximizing the efficiency of the company before the IPO to raise as much as possible capital through the sale of shares on the stock exchange. The decisions are mainly concentrating on maximizing income and profitability ratios in the period preceding the valuation and determination of price of the shares. These indicators can be a fundamental criterion for the decision on the introduction of the company's shares to public trading, which boils down to raise equity capital to finance planned investments. If a company collects more capital than planned, then it may be unprepared to use a larger amount of money for investment purposes. Such a situation may result in equity surplus over the investment requirements and finally usage of this equity for the policy relaxing purposes ending with lower profitability ratios.

The phenomenon of focusing on profits before the IPO has already been described in the literature, but the discussion is still open. The results of studies presented so far indicate that profitability ratios based on profit, grow before the IPO, and then fall. However, there are few studies where the research aims at several indicators together and explains whether

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declines in profitability ratios in the IPO were caused by the equity dilution, or whether increases in these indicators prior to the IPO, were caused by manipulation of profits in order to achieve higher share prices, and hence, market value.

The Warsaw Stock Exchange, the main organized market in Poland, started the trading in 1991. Between 1991–2000, some well prospering, nationally owned corporations were transformed through the public offering process and part of their shares outstanding was allowed to WSE quotations while the rest is still owned by the government. The first IPOs of companies established after the transition in 1989, became popular after year 2000. Those companies operated under different ownership relations and managed the capital structure based on non-political decisions. The early stage market-development companies could not possibly manipulate the profitability and optimize the capital structure since they were 100% government-owned entities, bearing the previous system constraints. On the other hand, in the beginning of the 1990s, investors did not have many attractive possibilities to put their money in, and those transformation-based IPOs were the subject of a big interest, especially when the strategic national companies were privatized.

The goal of this article is to present the profitability ratios behaviour before and after the IPO and to demonstrate certain regularities occurring in the company in the context of this event. There was verified the hypothesis that companies increase profitability before the IPO through windows dressing and gather more capital on the market than necessary for development, resulting in the equity dilution effect. It is expected that some profitability indicators of companies preparing for the IPO in the year before the IPO, increase over the previous year, and then fall after the IPO. The reason for this can be manipulating the profits before the IPO or equity surplus after the public offering, which will be determined by comparing the behaviour of the individual ratios before and after the IPO. The article consists of several parts, in which the authors present a review of the literature related to the analysis of the effect of the IPO, then present the methodology of the study, discuss the data and results, and finally concern the results of research by formulating conclusions.

2. Literature Review

The decision to enter the stock market and trade shares publicly is crucial for the company development. In the period before the IPO founders make decisions aimed at maximizing the market price when selling shares, as the collected capital will remain for further disposal of the company. It is one of the most popular concept, which has been proved in the examples in other countries. This phenomenon has been called in the literature the dressing windows operating performance.

There are some interesting attempts to the IPO and profitability problem that will be discussed in this section. Ahmad (2011) conducted a study related to economic efficiency of Malaysian companies entering the public market. The author concluded that the operational activities after the IPO clearly falls. The decrease in the value of ROA after the IPO was also observed by Wang (2005). Analysing more than 700 companies within the Chinese stock market in 1994–1999 he noted that the median ROA fell from 9.3% in the third year before the IPO to 6.4% three years after the IPO. He also drew attention to the fact of manipulating profits that could be the cause of this phenomenon. There are also articles in which the authors specifically suggest optimization of the time of IPO depending on the achieved results measured by the profitability ratios.

Peristiani and Hong (2004) investigated the financial condition of companies entering the stock exchange, such as NASDAQ, AMEX and NYSE between 1980–2000. They compared the profitability (ROA) of companies that entered the stock exchange in subsequent years in the period prior to the IPO. They noted that the ROA in the period before the IPO is lower for companies entering the stock exchange in a later period. At the same time they did not observe such decline in profitability among comparable, but not public companies. In their opinion this is an evidence that the deterioration in the financial condition of companies entering the stock market is not the result of weaker economic conditions, but indicates that companies with increasingly weaker condition are listed on the exchange. They found that it is the result of this form of business financing becoming more popular and of greater availability of stock exchanges for young companies. They noted also that the profile of the activities of individual companies was irrelevant, since the results in all sectors were weaker.

ROA is not the only indicator of profitability, which should be taken into consideration, especially that an IPO concerns equity and affects its profitability. Wu *et al.* (2009) have tested whether an IPO improves the performance of Chinese banks as measured by ratios: ROE and ROA. They found that in general the banks listed on the exchange have worse results than non-listed banks, and that the IPO had a significant positive impact on the growth of ROA before the IPO and the time when the emission was carried out. However, over time ROA fell. This means, according to them, that the presence of the bank in the stock market is not reflected in the operating results. Interestingly, not only on the U.S. market, but also on the Chinese one, there have been observed a phenomenon associated with lower performance of listed companies compared with those, that were not listed on the stock exchange. In addition, Wu *et al.* also observed that the improvement in ROA remained only briefly after the IPO, in the long term after the IPO banks' results were getting worse. They found that IPO results in increases of the size of the equity in the balance sheet of the company, but it does not improve the management and operational activities, and the longer the bank is listed on the stock exchange, the poorer ROA. This result may also indicate the equity dilution effect, as it will be analysed in this article. Similar observations were presented by Aharony *et al.* (2000), who studied the ROA of companies in the year of the initial public offering and the year after that. In the year of the initial public offering they found that the average ROA of companies got its peak, then fell. This decrease was significantly lower in the companies in the sectors supported by the government, *i.e.* fuel, raw materials and energy. Kurtaran and Bünyamin (2008) studied the listed companies in Turkey and they compared the ROA for the year preceding the IPO with ROA three years after the IPO. They showed that ROA three years after the IPO fell from 9% to -32.7%. The decrease in ROA was constant and continuous. Jain *et al.* (1994) have described, in turn, statistically significant decrease of P/BV, P/E and E/EPS after the IPO.

Alanazi and Liu (2013) analysed the 52 IPOs in the region of Gulf Cooperating Council in 2003–2010. The results indicated that IPO performance declines after going public. According to the authors the performance decline is associated with the firm transition from private into public ownership due to increasing agency cost. This research turn lends support to the window-dressing explanation of IPO performance decline. This problem has been dealt, among others, by Pereira and Sousa (2012) who focused on a comparison of the results with operations between the countries of Central and Western Europe. Jain and

Kini (1994), Mikkelsen *et al.* (1997), Kim *et al.* (2004) that result from operating activities of nearly 700 companies within three years after the IPO was significantly lower than the year before entering the exchange, as observed on the U.S. market. Sales in most cases increased, but not enough to improve the results with business operations after the IPO, usually with larger value of assets. They concluded that this may be due to the manipulation of profits prior to the IPO. They also speculated that the companies may decide on IPO after periods of good business, and decrease in the results may be a natural phenomenon. Similar observations were made by Chan *et al.* (2003) and Wang (2005) on the Chinese market.

Ahmad and Lim (2005) studied the Malaysian market. They observed a significant decrease in operating performance after the IPO. They also observed that the greatest importance to the outcome of the public offer was the size of the company and its results before the IPO. Zaluki (2008), who also studied the Malaysian market, observed the decrease in operating results and manipulation of the profits during the IPO. He likened the companies entering the stock market with the similar companies, remaining outside the stock exchange. As similar companies he treated those enterprises in the same sector, similar size or type of business that did not carry out an IPO. As an assessment criterion he used the operating profit margin ratio, calculated as the ratio of operating profit before tax and income from sales. He also noted that the largest decrease in the efficiency of companies can be noticed in the year after the IPO.

The examples show the general trend in the various markets to distort the level of profit before the IPO. Therefore, authors of this paper decided to investigate whether the same trend revealed on the Polish market, taking into account the four indicators of profitability and expanding research in time.

3. Research Methodology and Data

In order to determine the effectiveness of the company performance, we have selected indicators of profitability: return on assets (ROA) and return on equity (ROE). In addition two more indicators were taken into account, which are the operating profit margin (OPM) and net profit margin (NPM) to determine whether the increase in ROE and ROA before the IPO is the result of manipulation or equity dilution after IPO. If this is the dilution of equity, profit margins should remain at the same level after the IPO, while profitability ratios should fall due to the high level of unproductive cash and short-term investments. If before and after IPO, net profit margin and operating profit margin do not change, it will mean that the decline in ROE and ROA after the IPO results from the dilution of profit in relation to the equity and assets. If NPM and OPM fall as ROA and ROE, it will prove the windows dressing effect prior to the IPO. If a few years after IPO, ROE and ROA and NPM and OPM grow as well, this would mean a reduction in dilution and confirms that the decline in profitability after the IPO was the result of equity surplus. We do not have to reflect neither short-term fluctuations in the economy nor the deep transition within the 1990s. It is because we have focused on relation of ratios before IPO, the year of IPO and years after IPO separately for each company. Ratios of different companies have not been compared with each other.

The aim of this article is to present that IPO has a significant impact on financial results of each company regardless of the economy and of branch. Similar approach was presented by Peristiani and Hong (2004). They also did not match the economic background with financial ratios in different periods, although they analysed a similar, about 20-year

period. Due to the same reasons, we did not diversify samples by branch, size or maturity, either. The assumption is that taking into account all available IPOs does not influence the results of the whole sample, because both companies and potential investors adjust their expectation about IPO to the market conditions. Thus before IPO each company wants to present profitability on the highest level and carries out a window dressing. Than after IPO, having equity gathered in the amount higher than expected (due to windows dressing and investors hunger for new investments) companies cope with the problem of equity dilution.

The study will be performed as follows. Let us denote by t^{IPO} the IPO period for each company, by $t^{IPO} - 1$ a period one year before IPO, by $t^{IPO} - 2$, a period two years before IPO, by $t^{IPO} + 1$, a period one year after IPO, and so on. The purpose of this study is to examine if companies perform differently before and after the t^{IPO} and if $t^{IPO} - 1$ period is different from other periods. Sample contains 527 companies entering the WSE with t^{IPO} between 1991 and 2012. Data has been collected from NOTORIA Database, which contains financial documents of companies listed on Warsaw Stock Exchange.

For each company all available annual data on ROA, ROE, OPM, NPM, which are measurements of companies performance efficiency, were collected. All data relates to fiscal year, which is usually a year from 1st January till 31st December. Ratios have been calculated as follows:

$$\text{ROA (return on assets)} = \frac{\text{net profit (loss)}}{\text{total assets}}$$

$$\text{ROE (return on equity)} = \frac{\text{net profit (loss)}}{\text{shareholders' equity}}$$

$$\text{OPM} = \frac{\text{operating profit (loss)}}{\text{Net revenues from sales of goods, products and materials'}}$$

$$\text{NPM} = \frac{\text{net profit (loss)}}{\text{Net revenues from sales of goods, products and materials'}}$$

A company is included in the sample if there are at least two annual observations before t^{IPO} and at least two annual observations after t^{IPO} for a given variable. Number of observations before t^{IPO} varies from 2 to 10 in case of different companies and the number of observations after t^{IPO} varies from 2 to 8. Therefore, there are time series of a length at least 5 and at most 13 observations for each company and each variable.

We divide the whole time series into six subsamples to observe differences in companies performance in different moments of their lifetime – before and after IPO, and to check if one year before or after IPO is different in firm performance in any way. The purpose of this division is to extract information from a given period in a company lifetime and to conduct statistical tests, described below, to find differences in a firm performance.

In a first subsample, all observations from the beginning of time series (for some companies from 1991, and for some from the later year depending on the IPO date) of a given company to one year before IPO are included. For a given company it results from 2 to 10 annual data. Second subsample contains all observations included in a first subsample except observations from one year before IPO. Third subsample contains observations only from one year before IPO, therefore first subsample is divided into second and third subsample. Fourth subsample contains observations from one year after IPO until the end

of a time series and fifth subsample contains observations from one year after IPO only. Finally, the sixth subsample contains all observations from a second year after IPO until the end of time series, so subsamples five and six together give a subsample number four. Table 1 summarizes the division.

Table 1 | Subsamples

Subsample number	Time period
1	From 1991 to $t^{IPO} - 1$
2	From 1991 to $t^{IPO} - 2$
3	Period $t^{IPO} - 1$ only
4	From $t^{IPO} + 1$ to 2012
5	Period $t^{IPO} + 1$ only
6	From $t^{IPO} + 2$ to 2012

Source: own preparation

For each company in a given subsample, arithmetic mean from all available observations is calculated. That mean represents the average performance of a particular company measured by a chosen variable in a given subsample. Six values for each of five variables for each company, one for each distinguished subsample, were obtained. Therefore for each company there are 30 values of average firm performance measurements in corresponding subsamples.

To verify the hypothesis, we use Wilcoxon matched pairs test¹. This non-parametric test is commonly used to check differences between two probability distribution in case of many financial variables (see *e.g.* Barber, Lyon (1996, 1997), Loughran, Ritter (1997), O'Hara, Ye (2009) and many others). We use this test to compare probability distributions of a firm performance (measured in each case by different variable) in two different subsamples (see Table 1) and check if they have the same median. Pairs of observations, one from each subsample, are matched due to the fact that they are reflecting performance of the same company. After that, differences between paired observations are calculated and ranked, from the smallest difference to the largest one. If numbers of positive and negative differences are not statistically and significantly different from each other, we conclude equal medians in both subsamples, therefore there is no basis to claim that the performance of companies (measured by chosen variables) is different in given periods. Otherwise, if test indicates that statistically significant differences exist between medians in two subsamples, we conclude that the performance of a company has changed between the periods.

There are other methods to analyse this problem, as well. For example, Alanazi and Liu (2013) use unbalanced panel estimation to observe differences in companies performance before and after IPO. We are unable to use this methodology due to unavailability of data. There is a possibility to use a standard t – test instead of Wilcoxon test to observe differences

1 Sometimes this test is called “Wilcoxon signed-rank test”. See, for example, Sheskin (2003) for a computational details of this test.

in means between two subsamples. However, there is no empirical or theoretical evidence that the sample of company performance ratios for over 500 different companies is normally or close to normally distributed. Also, Wilcoxon test takes into account links between observations before and after IPO for the same company. For this reasons - availability of the data and lack of alternatives in methodology - we decided to apply Wilcoxon matched-pairs test.

4. Results

Based on the methodology presented in the previous section, the Wilcoxon matched-pairs tests were run and some interesting results can be presented here. Table 2 shows basic descriptive statistics for each variable and each subsample. Variables with digit "1" (e.g. ROA1) denote arithmetic means for each company in the first subsample and so on, correspondingly with Table 1. N denotes number of companies with available data and at least two observations before IPO and at least two observations after IPO for a given variable. Only a glance at provided means and medians for each variable in different subsamples leads to conclusion that, roughly speaking, firm performance, measured by any variable, is better before IPO than after IPO (means and medians in subsamples 1, 2 and 3 are, in general, greater than in subsamples 4, 5 and 6). We checked whether statistically significant differences between ratios are observed in companies' performance in various subsamples. For this purpose probability distributions of means for given subsamples were compared, taking into account matching between observations for a single company. The advantage of Wilcoxon matched-pairs test is that observations do not have to be normally distributed.

Wilcoxon matched pairs test examines median equalities in a given subsample and it is run for each selected pair of subsamples. Subsamples for each variable are compared in a following way:

- a) Subsample 1 with subsample 4.
- b) Subsample 2 with subsample 4.
- c) Subsample 3 with subsample 4.
- d) Subsample 2 with subsample 3.
- e) Subsample 1 with subsample 5.
- f) Subsample 1 with subsample 6.
- g) Subsample 2 with subsample 5.
- h) Subsample 2 with subsample 6.
- i) Subsample 3 with subsample 5.
- j) Subsample 3 with subsample 6.
- k) Subsample 5 with subsample 6.

Therefore 55 Wilcoxon matched pairs tests (11 for each of five variables (ratios)) are run to compare distributions of means in different subsamples. The results of a single test may be interpreted as follows. If test shows rejection of null hypothesis² then the median of a firm performance measured by a given variable in one of subsamples is statistically significantly larger than the median in the other subsample. This leads to conclusion that probability distributions are different in examined subsamples and it is justified to say that

2 We use level of significance $\alpha = 0.05$.

average firm performance in a subsample with a larger median was significantly better than in the other subsample.

If our hypotheses is correct then tests will show and confirm that after IPO companies' performance is worse than before IPO (median after IPO should be smaller than before IPO). Also it is expected that period $t^{IPO} - 1$ distinguishes itself from a whole sample due to unusual firm performance in that period. Table 3 summarizes results of all performed Wilcoxon matched pairs tests for each variable, Me stands for median for a given variable in a given subsample. Results show that in after-IPO-periods all variables reflecting firm performance are statistically and significantly lower than in before-IPO-periods. In addition, $t^{IPO} - 1$ period is characterized by significantly higher levels of given variables than in previous periods in three out of five cases. In that period firms achieve higher levels of all performance measurements than in after-IPO-periods. We also find that $t^{IPO} + 1$ period is a period of better firm performance than the one after that, regardless of the choice of variable.

In Table 4 all results are presented for the purpose of comparison. Distributions of each variable of a subsample were compared with analogical distribution of the same variable in different periods. Periods are described as related to the date of IPO and they are indicated with the same numbers as in Table 1. The results confirm our hypothesis for abnormally high levels of profitability ratios before IPO. It can be noticed that a period "t-1", i.e. a year before IPO is a special period. In this pre-IPO period all 4 analysed parameters were higher than before this period and after this period, too. The Table 4 shows that after IPO, i.e. in periods $t^{IPO} + 1$ to 2012, $t^{IPO} + 2$ to 2012 all parameters have worse levels than before IPO in general. In period $t^{IPO} + 1$ the results were better than after this period, but worse than before IPO in period from 1991 up to $t^{IPO} - 1$.

We can also find out some interesting variations from general conclusions. Operating profit margin and net profit margin in period $t^{IPO} + 1$ is the same as in period from 1991 to $t^{IPO} - 2$, whereas authors assumed that parameters in period $t^{IPO} + 1$ were worse than before IPO. It can indicate the equity dilution since the ROE and ROA are falling. Some equity surplus gathered during IPO, which was not expected, and may be invested in short-term securities since a company has little idea what to do with this additional cash. This problem may be related to the market development level, as well. The less developed market, the less efficient it is and the difference between IPO market prices and company expectation is higher. Polish capital market is surely a developing one and this inequilibrium may be characteristic for economies in transition with the equity dilution effect resulting from this phenomena. Usually the IPO prices are higher than those expected before due to prices recommendations.

5. Conclusions

This paper is bringing some interesting conclusions regarding the IPO and profitability of a company. First of all, we confirmed that period $t^{IPO} - 1$ is a period with the best results measured by ROA, ROE, but also operating profit margin and net profit margin. As it was stated in introduction of this paper, profitability of companies that go public, measured by ROE, ROA, net profit margin and operating profit margin in a year before IPO is better than in earlier periods. We also confirmed, that profitability of companies in a year before IPO is better than one year after IPO. The expectation that profitability of companies that go public measured by ROE, ROA, NPM and OPM within period before IPO is better than performance of a company within period after IPO, was also confirmed by the analysis.

As it is presented in Table 4, period $t^{IPO} - 1$ is a period with the best firm performance measures values in the analysed period. One of explanations for this fact is that companies manipulate with accounting data to show themselves in a better light to the potential investors before IPO. After the IPO, the results are getting worse, even worse than before the period $t^{IPO} - 1$. It can be observed for NPM and OPM that the results catch up with the level before IPO and it can indicate the equity dilution as a second potential reason for such a ROE and ROA behaviour in companies deciding to go public. These two effects may appear jointly and there may be the manipulation before IPO, and as a result the company may collect more money than required for investment strategy. Waiting for the adequate investment moment, a company shows lower ROA and ROE in the after IPO period.

Results confirm the phenomena called in literature as a window dressing. Companies improve their accounting data to attract potential investors and collect money. We had to admit that this is not a normal correction and it is related to fundamental aspects of a company and effects of IPO. During IPO the companies get a huge amount (usually more than they expected) of money, but they are not prepared to manage it efficiently or they do not have specific plans for investments connected to larger than expected, amount of money. If they are not ready for such a big surplus and their expectations were lower regarding the IPO price, it takes time to develop new investment strategy and to perform additional investment projects. Thus they operate in a less efficient way. Because operating profit margin behaves in the same way as net profit margin, it may be concluded that result of financial activities, abnormal activities, tax management have no significant impact on this phenomena. It must have been caused at operational stage. Having only 4 variables, it is hard to indicate clearly what happens at operational level before and after IPO but it may be a subject of a further study. We noticed that NPM and OPM are equal in two periods before IPO and one period after that. This result may confirm the effect of equity dilution, since ROE and ROA are worse after IPO when the same period is compared. This effect is weaker since the margins are the subject of manipulation before IPO as well.

Appendix

Table 2 | Descriptive Statistics of Subsamples

	N	Mean	Standard deviation	Minimum	Maximum	Percentiles		
						25.	50. (Median)	75.
NPMNPM1	150	5.483%	15.696%	−82.371%	71.232%	1.332%	3.595%	9.248%
NPMNPM2	150	3.855%	19.070%	−135.382%	52.456%	0.893%	3.144%	8.975%
NPMNPM3	150	8.769%	18.184%	−63.144%	125.289%	2.482%	6.170%	10.772%
NPMNPM4	150	−0.287%	21.577%	−112.674%	74.121%	−2.764%	2.147%	6.941%
NPMNPM5	150	1.880%	24.347%	−140.599%	78.676%	0.032%	4.027%	9.325%
NPMNPM6	150	−1.660%	25.203%	−138.935%	88.577%	−2.708%	1.702%	7.243%
OPMOPM1	148	7.519%	15.660%	−77.359%	77.403%	2.287%	5.601%	12.694%
OPMOPM2	148	6.288%	20.055%	−134.239%	76.443%	1.821%	4.921%	12.369%
OPMOPM3	148	10.090%	13.154%	−37.385%	79.324%	3.635%	7.494%	14.308%
OPMOPM4	148	1.748%	18.348%	−99.755%	61.688%	−0.574%	3.053%	8.419%
OPMOPM5	148	2.224%	23.000%	−117.898%	41.263%	.429%	4.988%	10.859%
OPMOPM6	147	1.469%	20.798%	−111.716%	75.378%	−1.130%	2.654%	8.092%
ROA1	216	6.100%	12.205%	−84.946%	52.088%	1.769%	5.585%	9.758%
ROA2	216	4.856%	13.512%	−70.077%	42.773%	0.899%	4.439%	9.222%
ROA3	216	8.510%	15.811%	−129.926%	117.216%	2.768%	6.763%	12.544%
ROA4	216	−0.519%	20.392%	−229.895%	24.243%	−1.170%	2.716%	6.875%
ROA5	216	1.675%	15.003%	−130.790%	29.984%	0.172%	4.042%	8.082%
ROA6	216	−2.180%	28.149%	−275.842%	22.922%	−0.371%	2.676%	6.736%
ROE1	123	17.660%	21.827%	−45.540%	82.901%	4.345%	17.772%	29.928%
ROE2	123	16.321%	30.296%	−142.604%	106.304%	3.421%	16.784%	32.615%
ROE3	123	20.310%	21.428%	−52.038%	69.660%	5.461%	18.339%	32.272%
ROE4	123	0.390%	18.823%	−132.855%	27.388%	−3.251%	3.255%	10.157%
ROE5	123	3.797%	22.532%	−128.206%	42.479%	0.476%	7.295%	14.461%
ROE6	123	−1.929%	23.850%	−159.473%	26.039%	−3.358%	3.461%	9.782%

Source: own calculations with SPSS

Table 3 | Wilcoxon Matched Pairs Tests Results

Comparison	Z statistic	p-value	Conclusion ($\alpha = 0.05$)	Comparison	Z statistic	p-value	Conclusion ($\alpha = 0.05$)
ROA4 - ROA1	-6.118	0.00000	$Me_{ROA4} < Me_{ROA1}$	OPM5 - OPM3	-3.729	0.00019	$Me_{MZ05} < Me_{MZ03}$
ROA3 - ROA2	-4.056	0.00005	$Me_{ROA3} > Me_{ROA2}$	OPM6 - OPM3	-5.475	0.00000	$Me_{OPM6} < Me_{OPM3}$
ROA4 - ROA2	-4.408	0.00001	$Me_{ROA4} < Me_{ROA2}$	OPM5 - OPM2	-1.595	0.11080	$Me_{OPM5} = Me_{OPM2}$
ROA4 - ROA3	-8.745	0.00000	$Me_{ROA4} < Me_{ROA3}$	OPM6 - OPM2	-2.827	0.00470	$Me_{OPM6} < Me_{OPM2}$
ROA5 - ROA1	-4.295	0.00002	$Me_{ROA5} < Me_{ROA1}$	OPM6 - OPM5	-2.939	0.00329	$Me_{OPM6} < Me_{OPM5}$
ROA6 - ROA1	-6.067	0.00000	$Me_{ROA6} < Me_{ROA1}$	ROE4 - ROE1	-6.843	0.00000	$Me_{ROE4} < Me_{ROE1}$
ROA5 - ROA3	-6.71	0.00000	$Me_{ROA5} < Me_{ROA3}$	ROE3 - ROE2	-1.358	0.17449	$Me_{ROE3} = Me_{ROE2}$
ROA6 - ROA3	-8.26	0.00000	$Me_{ROA6} < Me_{ROA3}$	ROE4 - ROE2	-6.093	0.00000	$Me_{ROE4} < Me_{ROE2}$
ROA5 - ROA2	-2.92	0.00350	$Me_{ROA5} < Me_{ROA2}$	ROE4 - ROE3	-7.804	0.00000	$Me_{ROE4} < Me_{ROE3}$
ROA6 - ROA2	-4.512	0.00001	$Me_{ROA6} < Me_{ROA2}$	ROE5 - ROE1	-5.502	0.00000	$Me_{ROE5} < Me_{ROE1}$
ROA6 - ROA5	-2.584	0.00977	$Me_{ROA6} < Me_{ROA5}$	ROE6 - ROE1	-6.822	0.00000	$Me_{ROE6} < Me_{ROE1}$
ROAg4 - ROAg1	-8.412	0.00000	$Me_{ROAg4} < Me_{ROAg1}$	ROE5 - ROE3	-6.588	0.00000	$Me_{ROE5} < Me_{ROE3}$
ROAg3 - ROAg2	-1.848	0.06467	$Me_{ROAg3} = Me_{ROAg2}$	ROE6 - ROE3	-7.923	0.00000	$Me_{ROE6} < Me_{ROE3}$
ROAg4 - ROAg2	-6.960	0.00000	$Me_{ROAg4} < Me_{ROAg2}$	ROE5 - ROE2	-4.841	0.00000	$Me_{ROE5} < Me_{ROE2}$
ROAg4 - ROAg3	-9.635	0.00000	$Me_{ROAg4} < Me_{ROAg3}$	ROE6 - ROE2	-6.149	0.00000	$Me_{ROE6} < Me_{ROE2}$
ROAg5 - ROAg1	-6.191	0.00000	$Me_{ROAg5} < Me_{ROAg1}$	ROE6 - ROE5	-4.021	0.00006	$Me_{ROE6} < Me_{ROE5}$
ROAg6 - ROAg1	-8.378	0.00000	$Me_{ROAg6} < Me_{ROAg1}$	NPM4 - NPM1	-3.337	0.00085	$Me_{NPM4} < Me_{NPM1}$
ROAg5 - ROAg3	-7.253	0.00000	$Me_{ROAg5} < Me_{ROAg3}$	NPM3 - NPM2	-5.408	0.00000	$Me_{NPM3} > Me_{NPM2}$
ROAg6 - ROAg3	-9.291	0.00000	$Me_{ROAg6} < Me_{ROAg3}$	NPM4 - NPM2	-2.373	0.01767	$Me_{NPM4} < Me_{NPM2}$
ROAg5 - ROAg2	-5.135	0.00000	$Me_{ROAg5} < Me_{ROAg2}$	NPM4 - NPM3	-5.072	0.00000	$Me_{NPM4} < Me_{NPM3}$
ROAg6 - ROAg2	-7.212	0.00000	$Me_{ROAg6} < Me_{ROAg2}$	NPM5 - NPM1	-1.234	0.21734	$Me_{NPM5} = Me_{NPM1}$
ROAg6 - ROAg5	-3.807	0.00014	$Me_{ROAg6} < Me_{ROAg5}$	NPM6 - NPM1	-3.71	0.00021	$Me_{NPM6} < Me_{NPM1}$
OPM4 - OPM1	-3.712	0.00021	$Me_{OPM4} < Me_{OPM1}$	NPM5 - NPM3	-3.166	0.00154	$Me_{NPM5} < Me_{NPM3}$
OPM3 - OPM2	-4.564	0.00001	$Me_{OPM3} > Me_{OPM2}$	NPM6 - NPM3	-5.573	0.00000	$Me_{NPM6} < Me_{NPM3}$
OPM4 - OPM2	-2.869	0.00411	$Me_{OPM4} < Me_{OPM2}$	NPM5 - NPM2	-0.493	0.62236	$Me_{NPM5} = Me_{NPM2}$

Source: own calculations with SPSS

Table 4 | Ratios Changes in the Process of IPO

Relation between ratios in period 1991 to t-1 (1) and period t+1 to 2012 (4)	Relation between ratios in period t+1 (5) and period 1991 to t-1 (1)	Relation between ratios in period 1991 to t-1 (1) and period t+2 to 2012 (6)
ROA: (1)>(4)	ROA: (5)<(1)	ROA: (1)>(6)
ROE: (1)>(4)	ROE: (5)<(1)	ROE: (1)>(6)
OPM: (1)>(4)	OPM: (5)<(1)	OPM: (1)>(6)
NPM: (1)>(4)	NPM: (5)=(1)	NPM: (1)>(6)
Relation between ratios in period 1991 to t-2 (2) and period t+1 to 2012 (4)	Relation between ratios in period t+1 (5) and period 1991 to t-2 (2)	Relation between ratios in period 1991 to t-2 (2) and period t+2 to 2012 (6)
ROA: (2)>(4)	ROA: (5)<(2)	ROA: (2)>(6)
ROE: (2)>(4)	ROE: (5)<(2)	ROE: (2)>(6)
OPM: (2)>(4)	OPM: (5)=(2)	OPM: (2)>(6)
NPM: (2)>(4)	NPM: (5)=(2)	NPM: (2)>(6)
Relation between ratios in period t-1 (3) and period t+1 to 2012 (4)	Relation between ratios in period t-1 (3) and period t+1 (5)	Relation between ratios in period t-1 (3) and period t+2 to 2012 (6)
ROA: (3)>(4)	ROA: (5)<(3)	ROA: (3)>(6)
ROE: (3)>(4)	ROE: (5)<(3)	ROE: (3)>(6)
OPM: (3)>(4)	OPM: (5)<(3)	OPM: (3)>(6)
NPM: (3)>(4)	NPM: (5)<(3)	NPM: (3)>(6)
Relation between ratios in period 1991 to t-2 (2) with period t-1 (3)		Relation between ratios in period t+1 (5) with period t+2 to 2012 (6)
ROA: (3)>(2)		ROA: (5)>(6)
ROE: (2)=(3)		ROE: (5)>(6)
OPM: (3)>(2)		OPM: (5)>(6)
NPM: (3)>(2)		NPM: (5)>(6)

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