A note on Brazilian IPOs performance in the long run

Ricardo Avelino[*]

Contents

Abstract · Resumo

This note examines the long-run performance of Brazilian IPOs based on a sample of 143 firms that went public between 2004 and 2013. There is no evidence that IPOs underperform the market in the 60 months after going public. An investor would have to put 12.6% more money in an investment that mimics the index than in the IPOs to achieve the same terminal wealth level five years later. IPOs with the highest initial returns have the worst aftermarket performance and there is mixed evidence that larger IPOs underperform the smaller IPOs in the five years subsequent to the offerings.

1. Introduction

The short-run underpricing of initial public offerings (IPOs) has been recognized for a long time in the financial literature. See, for instance, the empirical evidence in Ibbotson, Sindelar, and Ritter (1988), which shows that IPO initial returns, measured from the offering price to the first-day closing price are, on average, positive. More recently, Ritter (1991) pointed out that what appears to be underpricing in the short run may be overpricing when one focuses on the long run. He reports that a sample of 1,526 IPOs issued during 1975–84 in the U.S. substantially underperformed a set of comparable firms matched by size by as much as 29% in the three years after going public.

This note examines whether Brazilian IPOs underperform the market in the long run using a sample of 143 firms that went public between 2004 and 2013. To assess the long-run performance of IPOs, I employ five-year wealth relatives, defined as the ratio of one plus the five-year total return on IPOs and one plus the five-year total return on the Bovespa index. The selection of a five-year interval and the use of

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[*]Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo (FEA/USP). Av. Prof. Luciano Gualberto, 908, Cidade Universitária, São Paulo, SP, CEP 05508-010, Brasil. ⓘ 0000-0002-1343-8891

✉ avelino@usp.br

wealth relatives are motivated by the findings in Loughran (1993), who shows that IPO underperformance persists for approximately five years, and by the possibility to compare the results with those of previous studies.

My findings suggest that Brazilian IPOs do not underperform the market in the long run. The average five-year holding period return for the sample of IPOs is 49.17%, while the Bovespa index advanced, on average, 32.50% during this same five-year holding period, yielding a mean wealth relative of 1.126. Thus, an investor would have to put 12.6% more money in a passive fund that replicates the index than in the IPOs to achieve the same terminal wealth level after five years. We conclude, therefore, that the long-run underperformance is not a general phenomenon as the short-run underpricing widely documented in the literature. In six of the ten years analyzed, which concentrate 68.5% of the offerings, wealth relatives are greater than one. This finding does not support the "hot issue" market phenomenon.

The results also provide evidence that firms with the highest initial returns tend to have the worst aftermarket performance and that this tendency is somewhat stronger for larger issues than for smaller issues. They also point to marked differences in the long-run performance of individual industries. The fraction of secondary shares in the offering, by contrast, does not seem to impact the long-run performance.

Since the patterns highlighted in the previous paragraph are not independent of each other, I run a multiple linear regression to disentangle the effects of the several variables on five-year wealth relatives. According to the estimates, an increase of 5% in the adjusted initial return of an IPO would lead, *ceteris paribus*, to a reduction of 7.5–9.0 cents in the terminal wealth for each real invested in the IPO. The evidence concerning the impact of gross proceeds is mixed. The coefficient of the variable is statistically significant when the Ibovespa return in the 12 months preceding the IPO is included among the explanatory variables as a proxy for market sentiment, indicating that larger IPOs have a worse long-run performance than smaller ones, but it is not statistically significant when the Ibovespa return is replaced by the annual number of IPOs. The impact of Ibovespa returns in the three, six, nine or twelve months preceding the IPO, of the annual number of IPOs and of the percentage of secondary shares in the offering, by contrast, is not statistically significant.

This is not the first paper to analyze the long-run performance of Brazilian IPOs. Aggarwal, Leal, and Hernandez (1993) previously documented the underperformance of Brazilian IPOs over a horizon up to three years based on a sample of 62 offerings in 1980–1990. Leal (2004) also investigated a sample of IPOs during the high-inflation years of 1979 through 1992, but he focused on whether accounting information in the prospectuses are useful to predict short-term returns and, to a lesser extent, long-term returns up to three years.

The rest of the note is organized as follows. Section 2 describes the dataset used in this study and discusses in detail the methodology employed to assess the long-run performance of IPOs. Section 3 presents the empirical results, highlighting

the aftermarket performance by year of issuance, issue size, initial return, economic sector and the presence of secondary shares. Section 4 concludes.

2. Data and Methodology

The dataset used in this study consists of 143 firms that went public between 2004 and 2013. I exclude from the analysis seven Brazilian Depository Receipts, one issue whose total assets were below R$ 10 million and one IPO listed on the Bovespa Mais segment.

Table 1 presents the evolution of the annual number of IPOs in the sample in conjunction with the total number of offerings during the period under consideration and the aggregate gross proceeds, in millions of reais, including the overallotment option.

First, we see that the total number of IPOs varies substantially over time. It increases from 7 offerings in 2004 to 64 in 2007. In the next two years of the sample, the number of IPOs falls, on average, to 5 offerings per year and remains modest from 2010 to 2013, amounting to no more than 11 offerings per year.

Second, we see that the companies examined in this paper are a comprehensive sample of the IPOs over the period 2004–2013, representing 94.1% of the number of firms that went public and 97.4% of the aggregate gross proceeds raised by all firms.

Table 1. DISTRIBUTION OF INITIAL PUBLIC OFFERINGS BY YEAR

This table shows the number of initial public offerings and the aggregate gross proceeds raised by the firms for the initial sample of IPOs and for the subsample used in this study. Gross proceeds calculations include the overallotment options, if exercised. No price level adjustments have been made in this table.

	Total of 152 offerings		143 offerings in sample		Total included	
Year	No. of IPOs	Aggregate gross proceeds (R$ millions)	No. of IPOs	Aggregate gross proceeds (R$ millions)	No. of IPOs (%)	Aggregate gross proceeds (%)
2004	7	4,487,065,024	7	4,487,065,024	100.0	100.0
2005	10	6,333,364,411	9	6,317,364,411	90.0	99.7
2006	26	15,373,613,634	24	13,817,877,849	92.3	89.9
2007	64	55,648,186,085	59	53,248,633,923	92.2	95.7
2008	4	7,494,941,362	3	7,474,240,362	75.0	99.7
2009	6	23,831,458,391	6	23,831,458,391	100.0	100.0
2010	11	11,193,373,738	11	11,193,373,738	100.0	100.0
2011	11	7,175,095,457	11	7,175,095,457	100.0	100.0
2012	3	3,932,950,736	3	3,932,950,736	100.0	100.0
2013	10	17,293,349,990	10	17,293,349,990	100.0	100.0
Total	152	152,763,398,828	143	148,771,409,881	94.1	97.4

Third, we observe that there is, in general, a positive correlation between the annual number of IPOs and the corresponding aggregate gross proceeds, with the exception of 2008 and 2009.

Following Loughran and Ritter (1995), I calculate returns for two intervals: the initial return period, defined as month 0 and given by the length of time between the offering date and the end of the day in which the issue starts trading, and the five-year period after the IPO, encompassing the next 60 months following the first-day closing price. Each of these 60 months are defined as successive 21-trading day periods. For those companies that are delisted before the 60 months after the IPO, I assume that the proceeds are equally allocated among the surviving IPOs. Thus, the calculation of returns involves portfolio rebalancing.

To assess the long-run performance of IPOs, I employ five-year wealth relatives. Let r_{it} denote the monthly return of stock i on date t incorporating dividend payments, and r_{mt} the Ibovespa return for the corresponding calendar month. Consider the holding period return for stock i up to date T, given by

$$R_{iT} = \prod_{t=1}^{T}(1 + r_{it}) - 1$$

and, similarly, the holding period return on the market benchmark up to date T:

$$R_{mT} = \prod_{t=1}^{T}(1 + r_{mt}) - 1.$$

The wealth relative is computed as

$$WR = \frac{1 + \text{average 5 year total return on IPOs}}{1 + \text{average 5 year return on the market benchmark}},$$

where the Ibovespa is taken as the market benchmark. A wealth relative greater than one indicates that IPOs overperform the market in the five-year period. By contrast, a wealth relative below one provides evidence that IPOs underperform.

3. Aftermarket Performance

The Appendix presents the holding period returns for IPOs and for the market benchmark for the 60 months following the first closing price, along with wealth relatives and the number of firms trading in each month. Is is worth emphasizing that, by the end of month 60, only 16 of the 143 firms that went public were delisted, which represents 11.2% of the initial sample of IPOs. The average five-year holding period return on firms going public is 49.17%, which is almost 17% greater than the five-year holding period return of 32.50% on the benchmark. Further, we see, for

choices of intervals of 12, 24 and 36 months, that IPOs slightly underperform the market after the first-closing price, but by no more than 3%.

The close association between the holding period returns on IPOs and on the benchmark from month 0 to month 48, depicted in Figure 1(a), translates itself into a relative stability of the wealth relative. The deviation of the performance of IPOs from the benchmark becomes evident in the fifth year and is reflected in a sharp increase of the wealth relative, plotted in Figure 1(b). In sum, there is no evidence of underperformance of IPOs in the first four years and mild evidence of overperformance in the fifth year.

## 3.1 Aftermarket Performance by Year of Seasoning

Table 2 examines the long-run performance of IPOs segmenting the offerings by year of seasoning. As the table indicates, the long-run overperformance of IPOs is not a general phenomenon over the years. Wealth relatives are greater than one for six of the ten years in the sample and range from a minimum of 0.791 in 2012 to 2.892 in 2008. The four years in which wealth relatives are below one concentrate 31.5% of the IPOs in the sample.

Equipped with the mean wealth relative of 1.126, we can calculate the extra investment in a passive fund that follows the index required to achieve the same

Table 2. THE LONG-RUN PERFORMANCE OF IPOS BY COHORT YEAR 2004–2013
This table presents the long-run performance of IPOs by year of issuance. The five-year holding period return on companies going public in cohort τ is calculated as an equally weighted average of the firm individual five-year holding period returns in the 60 months following the first-day closing price. A month is defined as 21 successive trading day periods. The proceeds from firms that are delisted before their five-year anniversary are equally allocated among the surviving IPOs in the next month. The five-year market holding period return is also calculated as an equally weighted average of Ibovespa returns over the same holding periods of the IPOs. The wealth relative is given by the ratio of one plus the average five-year return on IPOs and one plus the average five-year return on the benchmark.

		Five-Year Holding Period Return		
Cohort Year	Number of IPOs	IPOs	Market	Wealth Relative
2004	7	152.06	197.49	0.847
2005	9	198.98	138.42	1.254
2006	24	22.11	22.70	0.995
2007	59	23.51	16.81	1.057
2008	3	178.29	−3.77	2.892
2009	6	77.36	−14.95	2.085
2010	11	25.92	−15.67	1.493
2011	11	−25.24	−8.85	0.820
2012	3	−2.47	23.29	0.791
2013	10	125.93	78.38	1.266
Total	143	49.17	32.50	1.126
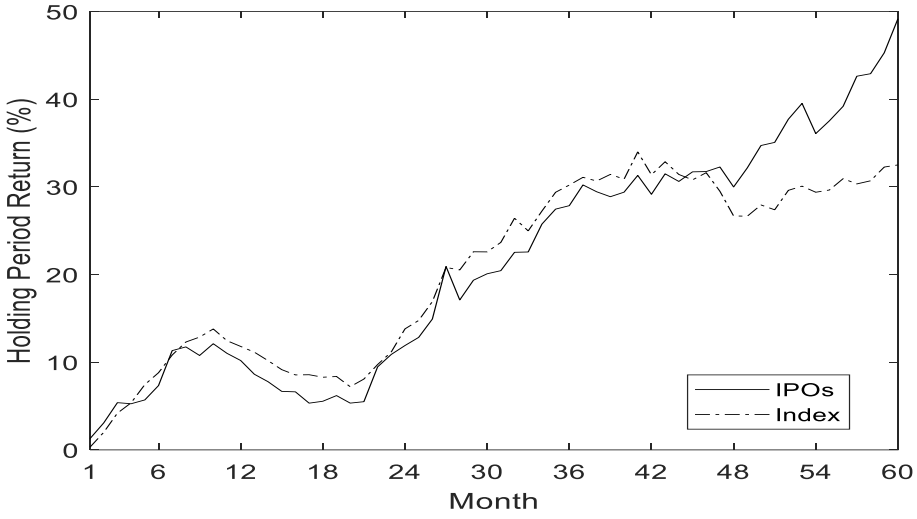
(a)
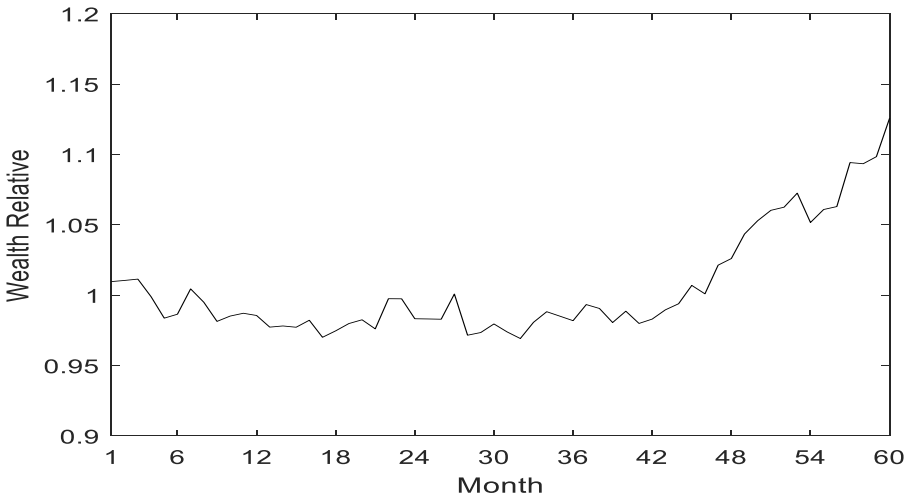
(b)

Figure 1. EVOLUTION OF HOLDING PERIOD RETURNS AND OF WEALTH RELATIVE
The top graph plots the average holding period return on 143 IPOs in 2004-2013 and on the market benchmark in the 60 months following the first-day closing price. The holding period return on the i-th IPO up to date τ is defined as $R_{i\tau} = \prod_{t=1}^{\tau}(1 + r_{it}) - 1$ and on the market benchmark as $R_{m\tau} = \prod_{t=1}^{\tau}(1 + r_{mt}) - 1$, where r_{it} and r_{mt} are, respectively, the return on initial public offering i and the Ibovespa return in month t. The bottom graph depicts the evolution of the wealth relative, calculated as the ratio of one plus the average holding period return on IPOs and one plus the average holding period return on the benchmark.

terminal wealth that would result from investing in the IPOs for five years. Suppose that an investor purchases the share of a representative IPO at the first closing price by R$ 10.00. After five years, she would have R$ 14.92. An investment of R$ 10.00 in the passive fund over the same time horizon would have produced R$ 13.25. This means that an investment of R$ 11.26 in the passive fund is required to receive the same R$ 14.92 after five years, or 12.6% more money than in the IPOs.

3.2 Aftermarket Performance by Issue Size and Initial Return

In Table 3, IPOs are categorized by gross proceeds of the offering in order to evaluate the long-run performance. The cutoffs were chosen to divide the sample into nine roughly equal-size subsamples. The table reveals that only three of the nine categories underperform the market in the long run and that, in contrast to the results presented in Ritter (1991), there is no tendency for smaller offerings to have the worst aftermarket performance.

Table 3. Mean Performance Measures for 143 IPOs in 2004–2013 Categorized by Gross Proceeds
This table segments the 143 IPOs in 2004–2013 by gross proceeds raised in the offering. Gross proceeds are converted to January 2004 reais using the IPCA to adjust for inflation. The cutoffs divide the sample into nine roughly equal-size subsamples. The table shows for each category the adjusted average initial return, the five-year wealth relative and the number of firms in the subsample in months 0 and 60. The average adjusted initial return is computed as an equally weighted average of IPO adjusted first-day returns. The first-day return is defined as the percentage change in price from the offering date to the close at the first-day of trading less the equivalent change in the Ibovespa. The five-year wealth relative is calculated as the ratio of one plus the average five-year return on IPOs and one plus the average five-year return on the benchmark. The average five-year return on IPOs is computed as an equally weighted average of the firm individual holding period returns in the 60 months following the first-day closing price. A month is defined as 21 successive trading day periods. For IPOs that are delisted before their five-year anniversary, the holding period returns are truncated accordingly. The average benchmark return is also calculated as an equally weighted average of Ibovespa returns over the same holding periods of the IPOs.

Gross proceeds (R$)	Adjusted average initial return	Five-year wealth relative	Sample Size	
			Month 0	Month 60
120,745,549–299,999,999	−1.32	1.459	19	16
300,000,000–349,999,999	1.49	0.921	15	12
350,000,000–399,999,999	5.91	0.816	14	14
400,000,000–449,999,999	4.00	1.302	17	16
450,000,000–499,999,999	4.62	1.156	16	12
500,000,000–599,999,999	4.20	1.234	17	17
600,000,000–799,999,999	5.49	1.200	18	16
800,000,000–1,199,999,999	9.76	0.966	14	11
1,200,000,000–9,843,069,357	5.27	1.020	13	13
All (mean)	4.18	1.140	143	127
All (median)	1.97	0.855	143	127

Table 3 also shows the adjusted initial return for the nine categories as well as the mean and median adjusted initial return. For the whole sample, the mean adjusted initial return equals 4.18% and is greater than the median of 1.97%. 86 of the 143 offerings, or 60.1%, have a positive adjusted initial return. All categories, with the exception of the issues that raised less than R$ 300 million, have a positive average adjusted initial return.

To the extent that average gross proceeds is a proxy of firm size and firm size can be interpreted as a measure of risk, we would expect larger issues to have smaller adjusted initial returns. The results in Table 3 do not seem to support this hypothesis. Indeed, we observe some tendency for larger firms to have a greater initial return.

Table 4 examines the relation between initial returns and aftermarket performance, measured by five-year wealth relatives, for initial return quintiles for both small and large offerings. We see that there is some tendency for firms with the highest adjusted initial returns to have the worst aftermarket performance. For all initial return quintiles, the five-year wealth relative is greater for issues raising less than R$ 465 million than for issues raising more than R$ 465 million.

Table 4. AFTERMARKET PERFORMANCE FOR 143 IPOs IN 2004–2013 CATEGORIZED BY INITIAL RETURN AND SIZE OF THE OFFERINGS
This table segments the 143 IPOs in 2004–2013 in adjusted initial return quintiles and presents for each quintile the five-year wealth relative for both small and large offerings. The adjusted initial return is defined as the percentage change in price from the offering date to the first-day closing price less the equivalent change in the Ibovespa. Gross proceeds are converted to January 2004 reais using the IPCA to adjust for inflation. The five-year wealth relative is calculated as the ratio of one plus the average five-year return on IPOs and one plus the average five-year return on the benchmark. The average five-year return on IPOs is computed as an equally weighted average of the firm individual holding period returns in the 60 months following the first-day closing price. A month is defined as 21 successive trading day periods. For IPOs that are delisted before their five-year anniversary, the holding period returns are truncated accordingly. The average benchmark return is also calculated as an equally weighted average of Ibovespa returns over the same holding periods of the IPOs.

| | All offerings | | Segmented by gross proceeds | | | |
| | | | Proceeds < R$ 465 million | | Proceeds > R$ 465 million | |
Initial return quintile	Five-year wealth relative	Sample Size	Five-year wealth relative	Sample Size	Five-year wealth relative	Sample Size
12.49 ≤ IR = 49.03	1.029	28	1.059	17	0.983	11
4.59 ≤ IR = 12.49	0.978	29	1.047	17	0.879	12
−0.07 ≤ IR = 4.59	1.098	29	1.140	14	1.058	15
−3.38 ≤ IR = −0.07	1.271	28	1.287	16	1.249	12
−17.18 ≤ IR = −3.38	1.323	29	1.432	17	1.168	12

3.3 Aftermarket Performance by Economic Sector

I turn now to the analysis of the long-run performance of IPOs categorized by economic sector. There are 52 industries represented in the sample. Banks and civil

construction contain 13 and 20 offerings, respectively. In the remaining industries, there are at most eight offerings. For this reason, I employ a broader classification in Table 5, based on the economic sector of the firm, following the classification adopted by BM&FBovespa. Economic sectors with less than 10 offerings are grouped into a single category. Table 5 also presents the average amount raised by economic sector along with adjusted initial returns and five-year wealth relatives.

An inspection of the table shows that there are marked differences in average gross proceeds across industries. The adjusted initial return also varies substantially across industries, ranging from a minimum of 1.43% for "all other firms" to a maximum of 7.99% for other financial institutions.

The wealth relatives suggest that there are significant differences in the long-run performance of individual industries. Half of the economic sectors underperform the market in the long run. Transport and construction (other than civil construction) has the worst long-run performance, with a wealth relative of 0.822, while cyclical consumption has the best performance among the eight industries, with a wealth relative of 1.571.

Cyclical consumption firms, which have the best long-run performance, have a mean adjusted initial return below average. However, the negative association

Table 5. Aftermarket Performance for 143 IPOs in 2004–2013 Categorized by Industry
This table shows the average gross proceeds, adjusted initial return and the five-year wealth relative for 143 IPOs in 2004–2013 categorized with respect to the economic sector of the firm, based on the classification adopted by BM&FBovespa. All economic sectors with less than 10 IPOs are grouped into a single category, called "All Other Firms". Gross proceeds are measured in reais of January 2004 purchasing power using the IPCA. The adjusted initial return is defined as the percentage change in price from the offering date to the first-day closing price less the equivalent change in the Ibovespa. The five-year wealth relative is calculated as the ratio of one plus the average five-year return on IPOs and one plus the average five-year return on the benchmark. The average five-year return on IPOs is computed as an equally weighted average of the firm individual holding period returns in the 60 months following the first-day closing price. A month is defined as 21 successive trading day periods. For IPOs that are delisted before their five-year anniversary, the holding period returns are truncated accordingly. The average benchmark return is also calculated as an equally weighted average of Ibovespa returns over the same holding periods of the IPOs.

Economic Sector	Sample size	Average gross proceeds	Initial return	Five-year wealth relative
Financial (Banks)	13	1,476,987,862	1.60	0.862
Financial (Others)	18	1,913,132,254	7.99	1.562
Transport and Construction (Civil Construction)	20	483,681,355	4.32	0.836
Transport and Construction (Others)	10	580,144,425	6.65	0.822
Cyclical Consumption	25	399,970,616	2.36	1.571
Non Cyclical Consumption	20	587,077,497	6.23	1.163
Telecommunication and Public Utility	10	731,956,863	5.76	1.329
All Other Firms	27	722,119,848	1.43	0.847

between initial returns and five-year wealth relatives, apparent from Table 4, does not hold for other economic sectors.

3.4 Aftermarket Performance by the Fraction of Secondary Shares

In Table 6, IPOs are categorized by the percentage of secondary shares in the offering. At first glance, it might be tempting to assume that a high fraction of secondary shares in the offering provides a negative signal about the future prospects of the company and that, *ceteris paribus*, the greater the percentage of secondary shares, the worse the long-run performance of the company.

However, if shareholders willing to add liquidity to their investments are particularly risk averse and strive to guarantee the successful completion of the IPO, they may be more conservative in setting the initial price range. Thus, the effect of secondary shares in the long-run performance of IPOs is *a priori* ambiguous.

Table 6 reveals that there is not a monotone relation between the fraction of secondary shares in the offering and five-year wealth relatives. IPOs with at least 80% of secondary shares have the best long-run performance with a wealth relative of 1.471, whereas the worst long-run performance is for those IPOs that include both primary and secondary shares and for which the percentage of secondary shares does not exceed 20%.

Table 6. AFTERMARKET PERFORMANCE CATEGORIZED BY THE PERCENTAGE OF SECONDARY SHARES FOR 143 IPOS IN 2004–2013

This table segments the 143 IPOs in 2004–2013 in six categories according to the percentage of secondary shares in the offering, including the overallotment option, if exercised. The five-year wealth relative is calculated as the ratio of one plus the average five-year return on IPOs and one plus the average five-year return on the benchmark. The average five-year return on IPOs is computed as an equally weighted average of the firm individual holding period returns in the 60 months following the first-day closing price. A month is defined as 21 successive trading day periods. For IPOs that are delisted before their five-year anniversary, the holding period returns are truncated accordingly. The average benchmark return is also calculated as an equally weighted average of Ibovespa returns over the same holding periods of the IPOs.

Secondary shares (%)	Sample size	Five-year wealth relative
0.00	45	1.351
0.01–20.00	19	0.780
20.01–40.00	31	1.005
40.01–60.00	15	0.821
60.01–80.00	16	1.179
80.01–100.00	17	1.471

3.5 Regression Results

The preceding analysis suggests that there is some tendency for firms with the highest adjusted initial returns to have the worst aftermarket performance and

that this tendency is somewhat stronger for larger issues. Moreover, it provides no evidence that, in years in which the number of new issues is heavier, IPOs tend to underperform. These patterns are in principle not independent of each other. Panel A of Table 7 reports the results of a multiple linear regression with the five-year wealth relative as the dependent variable and the adjusted initial return, the logarithm of gross proceeds, the annual number of IPOs and the percentage of secondary shares as explanatory variables in order to disentangle the effects of the several variables on the long-run performance of new issues.

The adjusted R^2 equals 0.046, smaller than the value of 0.070 reported by Ritter (1991) in a regression with three-year wealth relatives, indicating that the model is capable of explaining only a small part of the variability in five-year wealth relatives. The results of the ordinary least squares regression confirm the absence of impact of the annual number of IPOs on the long-run performance. The coefficient on the annual number of IPOs (divided by 100) equals −0.469 and it is not statistically significant at any reasonable level of significance, as indicated by the associated p value of 0.213 in parenthesis.

In addition, we observe that the coefficient on the adjusted initial return of −0.015 is negative and barely statistically significant at the conservative level of 10%, corroborating the previous evidence in Table 4. It is also economically significant. An investment of one real in an IPO at the upper bound of the fourth initial return quintile, for example, produces 12 cents less than the same investment in an IPO with an initial return equal to the average of 4.18 ($0.015 \times (12.49 − 4.18)$).

The coefficient on gross proceeds is numerically negative, but its impact, in contrast to the effect of the adjusted initial return, is not statistically different from zero, as indicated by the p value of 0.476. Finally, we see that the percentage of secondary shares is not statistically significant, suggesting that this variable has no effect on the long-run performance of IPOs.

To check the robustness of the regression results, I replace the annual number of IPOs by alternative variables that should be correlated with IPO activity in Panel B of Table 7. Specifically, I employ the Ibovespa return from the three, six, nine and twelve-months preceding the offering date.

Overall, the results are not very sensitive to the measure of IPO activity employed. The coefficient on the adjusted initial return varies from −0.018 to −0.017 in Panel B, compared with −0.015 in Panel A. The p value in the preferred specification (when the Ibovespa returns in the twelve preceding months are used), with the highest $\bar{R}^2$, is somewhat smaller than in Panel A and equals 0.071. Hence, the adjusted initial return remains statistically significant only at the 10% level.

Turning now to the Ibovespa return in the months prior to the IPO, we see that its coefficient is virtually zero regardless of the interval employed. The coefficient fluctuates between 0.001 and 0.003 as we move from the three- to the twelve-month return and the associated p values oscillate from 0.313 to 0.882. The coefficients,

Table 7. ORDINARY LEAST SQUARES REGRESSION RESULTS WITH THE FIVE-YEAR WEALTH RELATIVE AS THE
DEPENDENT VARIABLE, FOR 143 IPOS IN 2004–2013
Panel A reports the coefficient estimates of the following ordinary least squares regression: $WR_i = b_0 + b_1 IR_i + b_2 GP_i + b_3 IPO_i + b_4 Secondary\_Shares_i + e_i$; p-values are reported in parenthesis. WR_i stands for the five-year wealth relative, calculated as the ratio of one plus the average five-year return on IPOs and one plus the average five-year return on the benchmark. The average five-year return on IPOs is computed as an equally weighted average of the firm individual holding period returns in the 60 months following the first-day closing price. A month is defined as 21 successive trading day periods. For IPOs that are delisted before their five-year anniversary, the holding period returns are truncated accordingly. The average benchmark return is also calculated as an equally weighted average of Ibovespa returns over the same holding periods of the IPOs. IR_i is the adjusted initial return, defined as the percentage change in price from the offering date to the first-day closing price less the equivalent change in the Ibovespa. GP_i refers to the logarithm of gross proceeds, measured in millions of January 2004 reais using the IPCA. IPO_i is the number of IPOs in the year of issuance, divided by 100. $Secondary\_Shares_i$ stands for the percentage of secondary shares in the IPO, including the overallotment option, if exercised. Panel B replaces the explanatory variable IPO_i by the Ibovespa return from the three, six, nine and twelve-months preceding the offering date.

Panel A

Intercept	Adjusted initial return	Gross proceeds	Annual Number of IPOs	Secondary shares	$\bar{R}^2$
1.860	−0.015	−0.091	−0.469	0.002	0.046
(0.036)	(0.099)	(0.476)	(0.213)	(0.457)	

Panel B

Intercept	Adjusted initial return	Gross proceeds	Three-month Ibovespa return	Secondary shares	$\bar{R}^2$
1.715	−0.018	−0.098	0.002	0.003	0.036
(0.048)	(0.116)	(0.455)	(0.833)	(0.256)	

Intercept	Adjusted initial return	Gross proceeds	Six-month Ibovespa return	Secondary shares	$\bar{R}^2$
1.704	−0.017	−0.096	0.001	0.003	0.036
(0.051)	(0.081)	(0.448)	(0.882)	(0.255)	

Intercept	Adjusted initial return	Gross proceeds	Nine-month Ibovespa return	Secondary shares	$\bar{R}^2$
1.701	−0.017	−0.097	0.001	0.003	0.036
(0.049)	(0.079)	(0.455)	(0.847)	(0.247)	

Intercept	Adjusted initial return	Gross proceeds	Twelve-month Ibovespa return	Secondary shares	$\bar{R}^2$
1.624	−0.018	−0.101	0.003	0.003	0.043
(0.059)	(0.071)	(0.071)	(0.313)	(0.192)	

therefore, are not significant regardless of the measure of IPO activity employed, suggesting that the returns in the months preceding the IPO are not related to the long-run performance of new issues.

The coefficient on gross proceeds remains numerically negative and it is of the same order of magnitude of that reported in Panel A, but turns out to be statistically significant at the 10% level in the preferred specification with the twelve-month Ibovespa return preceding the offering date among the explanatory variables. Finally, we observe a tiny increase in the coefficient of the percentage of secondary shares, which is still not statistically significant in all specifications.

4. Conclusion

This note assessed the long-run performance of 143 Brazilian IPOs in 2004–2013. This is a comprehensive sample of the firms that went public over this period, representing more than 90% of the offerings. The results do not provide evidence that new issues underperform the market in the five years after going public. The average five-year holding period return on IPOs is 49.17%, roughly 17% greater than the holding period return on the benchmark, which equals 32.50%, yielding a mean wealth relative of 1.126. Hence, an investor would have to invest 12.6% more money in a passive fund that follows the index than in the IPOs to have the same terminal wealth level five years later.

The results, therefore, contrast with the findings of the international literature, which documents the tendency of IPOs to underperform in the long run. They also suggest that firms with the highest initial returns have a worse performance in the long-run and provide mixed evidence about the tendency of larger IPOs to underperform smaller offerings in the long run. Other variables such as the annual number of IPOs, the Ibovespa return in the months preceding the offering and the percentage of secondary shares in the IPO do not seem to have any impact on the aftermarket performance.

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Appendix.

Table A-1. ABNORMAL RETURNS FOR INITIAL PUBLIC OFFERINGS IN 2004–2013

This table shows the average holding period return for 143 IPOs in 2004–2013 and for the market benchmark along with the wealth relative for each of the 60 months following the first-day closing price. The average holding period return for IPOs up to date τ is defined as $R_{i\tau} = \sum_{t=1}^{\tau}(1 + r_{it}) - 1$ and as $R_{m\tau} = \sum_{t=1}^{\tau}(1 + r_{mt}) - 1$ for the market benchmark, where r_{it} and r_{mt} are, respectively, the total return on initial public offering i and the Ibovespa return in month t. The wealth relative is defined as the ratio of one plus the average holding period return on IPOs and one plus the average holding period return on the benchmark.

Month of seasoning	Number of firms trading	Mean Holding Period Return		Wealth Relative
		IPOs	Benchmark	
1	143	1.29	0.31	1.010
2	143	3.08	2.00	1.011
3	143	5.39	4.19	1.012
4	143	5.26	5.37	0.999
5	143	5.70	7.44	0.984
6	143	7.33	8.80	0.987
7	143	11.32	10.82	1.005
8	143	11.75	12.30	0.995
9	143	10.77	12.87	0.981
10	143	12.11	13.79	0.985
11	143	11.01	12.45	0.987
12	142	10.19	11.80	0.986
13	142	8.63	11.15	0.977
14	142	7.78	10.18	0.978
15	142	6.67	9.15	0.977
16	141	6.62	8.55	0.982
17	140	5.33	8.57	0.970
18	140	5.55	8.29	0.975
19	140	6.19	8.37	0.980

(continue)

Table A-1. (*continued*)

Month of seasoning	Number of firms trading	Mean Holding Period Return		Wealth Relative
		IPOs	Benchmark	
20	140	5.33	7.20	0.983
21	140	5.50	8.08	0.976
22	140	9.46	9.73	0.998
23	140	10.89	11.17	0.998
24	140	11.90	13.80	0.983
25	139	12.83	14.76	0.983
26	139	14.92	16.91	0.983
27	139	20.92	20.81	1.001
28	137	17.10	20.52	0.972
29	137	19.35	22.60	0.974
30	137	20.09	22.58	0.980
31	137	20.44	23.66	0.974
32	137	22.53	26.42	0.969
33	135	22.57	24.98	0.981
34	135	25.75	27.24	0.988
35	135	27.46	29.38	0.985
36	135	27.85	30.21	0.982
37	135	30.22	31.09	0.993
38	134	29.44	30.67	0.991
39	134	28.88	31.42	0.981
40	133	29.40	30.88	0.989
41	132	31.31	33.99	0.980
42	131	29.15	31.38	0.983
43	131	31.49	32.87	0.990
44	129	30.62	31.41	0.994
45	129	31.72	30.80	1.007
46	129	31.75	31.62	1.001
47	129	32.27	29.50	1.021
48	129	29.99	26.69	1.026
49	129	32.16	26.65	1.044
50	129	34.72	27.94	1.053
51	129	35.07	27.39	1.060
52	129	37.72	29.61	1.063
53	128	39.52	30.08	1.073
54	127	36.08	29.39	1.052

(*continue*)

Table A-1. (*continued*)

Month of seasoning	Number of firms trading	Mean Holding Period Return		Wealth Relative
		IPOs	Benchmark	
55	127	37.54	29.64	1.061
56	127	39.19	30.94	1.063
57	127	42.62	30.34	1.094
58	127	42.91	30.69	1.094
59	127	45.28	32.26	1.099
60	127	49.17	32.50	1.126