# 10 Long run stock performance of initial public offerings: An international insight

## Introduction

In the last two decades a variety of empirical studies examined the long-run return of the IPO stocks. Numerous publications have dealt with the U.S. stock market that, due to its long history and vast number of equity offerings, was from the very beginning the favorite investigation object for capital market researchers. Meanwhile, long-term price behavior after initial stock issues has become widely documented not only in the meaningful developed stock markets like Germany or the UK but also in smaller economies. Moreover, equity offerings in emerging markets have experienced a fast interest growth in recent years. Numerous IPO studies were created for the markets with particularly large trading volume and growth potential such as China and India. On the contrary, in smaller emerging markets the aftermarket price behavior of IPO stocks is still not sufficiently investigated, partly due to relatively few security issues and partly due to difficult access to the full range of historical data. The main goal of this article is to assemble systematically selected capital market studies, demonstrating that the long-run underperformance is a widely existing phenomenon and its magnitude changes over time. Additionally, this paper will also briefly discuss the most important reasons for the weak performance of IPO stocks beyond their first listing day and point to the possible drivers for their negative excess returns. In order to have a clear reference framework, only the event studies with at least three years horizon will be considered in the subsequent literature overview. Furthermore, only the abnormal returns calculated by means of the buy-and-hold (BHAR) or cumulative average (CAR) methodology will be taken into account. It is important to note, that the study does not try to include the empirical results from every corner of the world. Instead it concentrates on countries with the largest importance for the

international capital market. An additional clustering of the performance figures by region should highlight the differences in the long-run IPO return documented in various areas of the world.

## 1. Methods for evaluating the long-term performance of IPO stocks

Probably the trickiest issues accompanying the comparison of the long-run performance of IPO stocks are different calculation methods and different benchmarks used in the existing empirical studies. Academic literature has documented a variety of methods for evaluating the long-run performance of IPO stocks,[1] however two of them are most common: the CAR and the BHAR. From a formal point of view, the first method is based on additive and the second on multiplicative linking of periodical returns, whereby both techniques require a constant investment in all stocks assembled in a sample.[2] In case of determining the CARs, an additional stock weight rebalancing has to be done after the end of each subperiod, leading to the equal distribution of security weights in the sample. Barber and Lyon (1997) suggest that BHAR is more appropriate than CAR for evaluating the long-run performance of IPO stocks. Furthermore Lyon et al. (1999) argue that BHARs are more important because they precisely measure the real buy-and-hold experience of investors.[3] For this reason the results calculated by means of the BHAR methodology will enjoy priority in the subsequent considerations.

Besides the calculation methodology, the different types of benchmarks may also complicate an objective comparison of the performance

[1] For example see B.M. Barber, J.D. Lyon, *Detecting Long-run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics*, "Journal of Financial Economics" 1997, Vol. 43, pp. 341–372; J.D. Lyon, B.M. Barber, C.L. Tsai, *Improved Methods for Tests of Long-Run Abnormal Stock Returns*, "Journal of Finance" 1999, Vol. 54, pp. 165–201; H. Bhabra, R. Pettway, *IPO Prospectus Information and Subsequent Performance*, "Financial Review" 2003, Vol. 38, Issue 3, pp. 369–397.

[2] See S.P. Kothari, J. Warner, *Measuring Long-Horizon Security Price Performance*, "Journal of Financial Economics" 1997, Vol. 43, pp. 312; B.M. Barber, J.D. Lyon, *op.cit.*, p. 344.

[3] See J.D. Lyon, B.M. Barber, C.L Tsai, *op.cit.*, p. 172.

results. According to Loughran and Ritter (1995), the measurement of long-run abnormal performance might be very sensitive to the benchmark used.[4] The literature provides basically three return adjustment approaches that can be used for the measurement of long-term performance. The first possibility is a comparison of an IPO stock against a stock of non-IPO firm with similar fundamental characteristics. Among the most commonly used selection criteria are industry affiliation, market capitalization, as well as book-value and market-value ratios.[5] This kind of benchmarking is widely used in the IPO studies of developed capital markets. The second option is building reference portfolios comprising of non-issuing companies with similar characteristics to the IPO firm. Also in this case a comparatively large matching firm universe is required and therefore this sort of benchmarking is usually suitable for investigation of large capital markets. For stock markets with a narrow range of comparable companies, market indexes are probably the best benchmarks. The largest advantage of this approach is the lack of any subjective influence on the composition of the benchmark portfolio. However, the most significant drawback is that the measured IPO effects are included in the benchmark performance. At this point it is important to note that indexes, which consist mostly of smaller companies, are comparatively better benchmarks for the performance measurement of newly issued stocks. This is because smaller companies are more similar to IPO firms, than larger companies.[6] Mainly due to the absence of broad stock universes, the market index has been usually the first choice in the

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[4] See T.J. Loughran, J.R. Ritter, *The New Issues Puzzle*, "Journal of Finance" 1995, Vol. 50, p. 35.

[5] For example see J.R. Ritter, *The Long-Run Performance of Initial Public Offerings*, "Journal of Finance" 1991, Vol. 46, pp. 3–27; T.J. Loughran, J.R. Ritter, *op.cit.*, pp. 23–51; R. Stehle, O. Ehrhardt, R. Przyborowsky, *Long-Run Stock Performance after Initial Public Offerings and Seasoned Equity Issues in the German Capital Market*, "European Financial Management" 1999, Vol. 6, pp. 173–196; M. Kooli, J.M. Suret, *The Aftermarket Performance of Initial Public Offerings in Canada*, "Journal of Multinational Financial Management" 2004, Vol. 14, Issue 1, pp. 47–66.

[6] See A. Sapusek, *Benchmark-Sensitivity of IPO Long-Run Performance: An Empirical Study for Germany*, "Schmallen-bach Business Review" 2000, Vol. 52, p. 397.

studies focusing on the IPOs in emerging markets and lower capitalized developed markets. Consequently, a fair comparison of the performance results reported for different emerging countries should be generally possible, whereas a comparison with the IPO effects documented for developed countries might be difficult.

## 2. Evidence from the US-American Market

Numerous studies carried out in the US show existence of long-run underperformance in this market. Ritter (1991) investigated 1526 IPOs of common stocks issued during the period of 1974–1985. Using a self-constructed size portfolio as benchmark, the author found a cumulative average abnormal return amounting to –10.2% for one-year and –29.1% for three-year holding period. Also when using AMEX-NYSE and NAS-DAQ as reference indexes, a strong underperformance was well recognizable. In addition, the author concluded that stocks offered particularly by small and medium-sized companies suffered from strong negative returns. In another US American, study Loughran and Ritter (1995) examined 4743 IPOs occurred between 1970 and 1990 founding three-year underperformance of –26.9% measured against the AMEX-NYSE-portfolio. Like in the study of Ritter (1991), this result was highly statistically significant. An alternative performance adjustment by return of similarly capitalized companies led also to a strong negative excess return of the sample. The results of newer studies about the price behavior after stock offering in the US point to changes in the magnitude of long-run return over time. Ritter and Welch (2002) analyzed the performance of 6249 stocks issued between 1980 and 2001 and found a very strong influence of the chosen benchmark on the excess return three years from the date of the first listing. While the stock performance measured against the market weighted CRSP index reached a significant negative average value of –23.4%, the sample underperformed the reference portfolio compounded of similarly capitalized companies by only –5.1%. This finding is consistent with results of other studies, such as the of Brav and Gompers (1997), who found that IPO underperformance is sensitive to the used benchmark

Table 1

Long run IPO studies regarding the US market

| Author(s) | Sample period/size | Approach | Benchmark | 3-year excess return (%) |
|---|---|---|---|---|
| Ritter (1991) | N = 1526 1974–1984 | CAR | Size matching firm portfolio | −29,1 |
| Loughran/Ritter (1995) | N = 4753 1970–1990 | BHAR | AMEX-NYSE | −26,9 |
| Ritter/Welch (2002) | N = 6249 1980–2001 | BHAR | CRSP index (value weighted) Size matching firm portfolio | −23,4 −5,1 |
| Brau et al. (2012) | N = 4753 1935–1972 | BHAR | CRSP index (value weighted) | −19,9 |

AMEX-NYSE – American Stock Exchange.
CRSP – Center of Research in Security Prices.

Source: authors own elaboration.

and notably smaller after adjusting for size.[7] Recently, Brau et al. (2012) examined 3547 IPOs launched during the period of 1985-2003 using the value-weighted CRSP index and the style adjusted reference portfolios as benchmarks. In the first case, the authors found a significant negative buy-and-hold abnormal return of −17.1% three years, and −25.7% five years after stock issue. In the second case they compared the IPO-sample against the benchmark portfolio consisting of companies with similar size and book to market characteristics and documented the style adjusted three-year return of −5.5% and five-year return of −10.7%. These results show that the negative price behavior after initial stock issue persists in the US longer than three years and is getting weaker over time.

## 3. Evidence from other developed Markets

The long-term performance of IPO stocks documented for European markets is also largely negative. In the UK, Levis (1993) investigated the aftermarket price behavior of 712 IPO stocks issued in the years 1980–1988. He calculated the excess returns using FTA index, HGSC

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[7] See A. Brav, P.A. Gompers, *Myth or Reality? The Long-Run Underperformance of Initial Public Offerings: Evidence from Venture and Nonventure Capital-Backed Companies*, "Journal of Finance" 1997, Vol. 52, p. 1818.

index and an equally weighted all-share portfolio as benchmarks and found a three-year underperformance between –4.2% and –21.3%. Several years later Brown (1999) examined 232 stocks issued in the UK, however he was not able to provide any empirical evidence, that IPO firms underperform over a three-year time period. The average sample return adjusted by the FTA index yielded –0.91%, which was much higher than the analogue abnormal performance documented in the Levis' study. Recently Gregory et al. (2009) analyzed the sample consisting of 2499 UK IPOs launched between 1975 and 2004. The authors found convincing evidence of long-run underperformance lasting between 36 and 60 months post-flotation and strongly depending on the method chosen to measure abnormal return. The sample underperformed the value-weighted control portfolio by around –12.6% over three years and by –31.6% over a five-year observation period. Underperformance was even more significant when equally-weighted control portfolio and matching-firms were used as benchmarks. Various studies on German IPO stocks have shown that they also experienced negative long-run excess returns in the long term. Ljungqvist (1997) examined 154 IPOs and found an underperformance of –19.95% against the DAFOX index. Thies (2000) documented a negative long-run excess return of the German IPO stocks too, whereby the DAX adjusted three-year sample return amounted in average to –12.7%. The adjustment by the value-weighted and equal-weighted DAFOX index led to the underperformance by –9.8% and –7.8%, respectively. Comparatively weaker underperformance of German IPO firms has been reported by Stehle and Ehrhardt (1999). The authors examined 187 stocks issued between 1960 and 1992 at the regulated market in Frankfurt and documented a three-year buy-and-hold abnormal stock returns amounting to –5.04% and 1.54%, depending on the used benchmark.

A greater diversity in the aftermarket excess return has been observed for IPO stocks in the developed markets characterized by lower capitalization. In Austria, Aussenegg (1997) examined 51 IPOs and documented a three-year underperformance amounting in average to –56.9%. Several years later, Alvarez and González (2001) observed a significant negative excess return of Spanish IPO stocks issued between 1987 and 1997.

The authors found that the sample underperformed the value-weighted as well as the equal-weighted Madrid Stock Market index by –29.5% and –14.2% respectively, for a period of 36 months from the date of first listing. An underperformance of a comparable magnitude had been documented by Arosio et al. (2000) for the Italian IPOs. The authors examined 97 companies that went public on the local stock exchange between 1985 and 1997 and found a three-year market-adjusted return amounting for –11,53%. Even though this result was not statistically significant, the underperformance of Italian IPO stocks over the shorter holding periods (one and two years) was proven by statistical tests. In France, Leleux (1993) studied the long-term stock performance of 69 IPOs launched between 1985 and 1991 and found a market-adjusted abnormal return of –11.2%. In a later study, Bossin and Sentis (2012) examined 207 French IPOs occurring between 1991 and 2005. Using the size and book-to-market portfolios as benchmarks, the authors found that French IPO stocks underperform significantly their non-issuing peers in the long run. They reported a three-year excess return of –28.85% against the size adjusted benchmark portfolio and –68.1% against its book-to-market adjusted version. In another remarkable study, Drobetz et al. (2005) investigated the long-run performance of Swiss IPOs listed between 1983 and 2000. The authors computed buy-and-hold abnormal returns and cumulative abnormal returns using 120 months of secondary market data. However, in contrast to findings in other developed countries, they did not find any strong evidence for an IPO effect. The resulting three-year excess returns amounted of –7.45% measured against the SPI index and of 5.12% against the VSCI index. Similarly, no long run underperformance has been found in the case of Swedish IPOs. Loughran et al. (1994) examined 162 stocks issued between 1980 and 1990 and found an average outperformance amounting of 1.2% for a period of three years from the date of listing.

In addition, various studies about the non-European developed markets suggest, that long-run underperformance of IPOs is more than a regional phenomenon. Lee et al. (1996) reported a three-year cumulative abnormal return of –46.5% for Australian IPO stocks issued between 1976 and 1989. The examination of the Japanese IPO market carried out by Kirku-

lak (2008) revealed for the stocks listed between 1998 and 2001 a three-year underperformance of –18.3%. In Canada Kooli and Suret (2004) studied the long-run stock price behavior after IPOs issued between 1991 and 1998. For a sample consisting of 445 events they documented a three-year excess return against non-issuing matching firms amounting of –19.96%. For a five-year period, the underperformance reached even –26.5%. All these findings show that IPO returns in smaller developed countries tend to be higher, than in large ones. This situation might result from more transparency and limited number of issuing firms in smaller markets.

Table 2

Long run IPO studies regarding the largest developed markets (ex US)

| Author(s) | Market | Sample period/size | Ap-proach | Benchmark | 3-year excess return (%) |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Aussenegg (1997) | Austria | N = 51 1984–1991 | BHAR | Size matching firm portfolio | –56.91 |
| Lee et al. (1996) | Australia | N = 266 1976–1989 | CAR | Australian All Industrials Accumulation Index | –46.5 |
| Kooli/Suret (2004) | Canada | N = 445 1991–1998 | BHAR | Non issuing matching firms | –19.96 |
| Leleux (1993) | France | N = 69 1985–1991 | CAR | SBF 250 Index | –11.21 |
| Bossin/Sentis (2012) | France | N = 207 1991–2005 | BHAR | Size matching firm portfolio Book-to-market matching firm portfolio | –28.85 –68.10 |
| Ljungqvist (1997) | Germany | N = 154 1970–1990 | CAR | Size matching firm portfolio | –19.95 |
| Stehle/Ehrhardt (1999) | Germany | N = 187 1960–1992 | BHAR | Regulated Market (val-weight) Regulated Market (eq-weight) | 1.54 –5.04 |
| Thies (2000) | Germany | N = 218 1977–1995 | BHAR | DAX DAFOX (val-weighted) DAFOX (eq-weighted) | –12.7 –9.8 –7.8 |
| Arosio et al. (2000) | Italy | N = 97 1985 – 1996 | BHAR | MIB Index | –11.53 |
| Kirkulak (2008) | Japan | N = 433 1998–2001 | CAR | Tokyo Stock Exchange 300 | –18.3 |

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Alva-rez/Gonzalez (2001) | Spain | N = 56 1987–1997 | BHAR | IGBM index (val-weighted) IGBM index (eq-weighted) | −29.55 −14.16 |
| Loughran et al. (1994) | Sweden | N = 162 1980–1990 | CAR | Size matching firm portfolio | 1.2 |
| Drobetz et al. (2005) | Switzer-land | N = .... 1983–2000 | BHAR | SPI VSCI | −1.69 5.12 |
| Levis (1993) | UK | N = 720 1980–1988 | CAR | FTA Index (val-weighted) FTA Index (eq-weighted) HGSC Index | −4.20 −21.3 −8.10 |
| Brown (1999) | UK | N = 232 1990–1995 | BHAR | FTA Index | −0.91 |
| Gregory et al. (1999) | UK | N = 2499 1974–2004 | BHAR | Size matching firm portfolio (val-weighted) Size matching firm portfolio (eq-weighted) | −12.6 −16.4 |

eq-weight. – equally weighted, val-weight – value weighted.
FTA – Financial Times Actuaries; HGSC – Hoare Govett Smaller Companies; IGBM – Madrid Stock Exchange General Index; MIB – Mailand Stock Exchange Index; DAX – German Large Cap Stock Index; DAFOX – German Stock Index for Research; SBF 250 – Société des Bourses Françaises 250 Index; SPI – Swiss Performance Index; VSCI – Vontobel Small Cap Index.

Source:  authors own elaboration.

## 4. Evidence from Emerging Markets

Numerous studies on the emerging markets also provide evidence for long-term underperformance of IPO stocks. Here, the amount of ob-served returns varies substantially across the single countries. Lough-ran et al. (1994) documented an enormous influence of certain capital market structures and country-specific investment regulations on excess return of IPO stocks in the first few years after listing.[8] This is mainly associated with the IPOs conducted by previously state-owned enterpris-es, since in emerging economies numerous newly privatized firms issue stocks. However, the biggest obstacle for the examination of the long-run performance for IPOs in emerging markets is a relatively low number of

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[8]  See T.J. Loughran, J.R. Ritter, K. Rydqvist, *Initial Public Offerings: Interna-tional Insights*, "Pacific-Basin Finance Journal" 1994, Vol. 2, p. 196.

listed companies. As a result, the majority of researchers have to refrain from the return adjustment by means of matching firms or portfolios with similar size and value characteristics. Hence, the measurement of the long-run performance is restricted to the market indexes provided by the local stock exchanges.[9] Furthermore, the size of the IPO samples is usually quite small, which is primarily due to relatively short equity market history in comparison to developed economies.

In Latin America, Aggarwal et al. (1993) examined long-run performance of Brazilian, Chilean and Mexican IPO stocks issued in 1980s and found negative three-year abnormal stock returns in all these markets. The proven underperformance was equivalent to –47%, –23.7% and –19.6% and statistically significant. In a later study, Celis and Maturana (1998) documented for Chilean IPOs launched between 1991 and 1995 a positive aftermarket excess return amounting for 9.8%. The authors found also a slight outperformance for the one-, two- and four-year observation period. However the examined sample consisted of only 18 IPO companies and its average return was influenced by several positive outliers. In South Africa, Govindasamy (2010) reported a negative long-run performance of IPOs placed on the Johannesburg Stock Exchange (JSE). After examining a sample comprising of 229 security issues which occurred between 1995 and 2006, he found a significant underperformance against the JSE All Share Index reaching –50%. Considerably weaker underperformance was documented by Rekik and Bouyelbene (2013) for 40 Tunisian IPO stocks listed between 1992 and 2008. Using the market capitalization weighted index for the Tunisian Stock Exchange as benchmark, the authors found the three-year cumulated abnormal return amounting of –3%. Several further studies point out to the significant long-run underperformance after IPOs in the Central and Eastern European stock markets. Lyn and Zychowicz (2003) examined the stock price behavior for 33 Hungarian and 66 Polish IPOs launched between 1991 and 1998. Using the local market indexes as benchmarks, the authors found similar performance characteristics for both samples: a slight un-

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[9] See S.D. Choi, I. Lee, W. Megginsson, *Do Privatisation IPO Firms Outperform in the Long-Run?*, "Financial Management" 2010, Vol. 39, Issue 1, p. 154.

derperformance in the first year, followed by minor outperformance in the second year and a strong decline of excess return in the third year after the issue. Furthermore, the three-year excess return of Polish IPO stocks turned out in average lower, than the one of their Hungarian peers. Also more recent studies point to the long run underperformance after stock listings in Poland. For a sample comprised of 103 IPOs listed between 1998 and 2004, Darmetko (2009) reported a three-year excess return amounting of –31.07% and –42.59%, depending on the applied benchmark. In another study, Zielinski (2013) noted substantial long-run underperformance of IPO stocks listed at the Warsaw Stock Exchange. The author examined 263 equity offerings launched between 1994 and 2006 using the value weighted WIG index and the equal weighted polish stock market portfolio as benchmarks. Depending on the applied reference portfolio, the documented three-year average return amounted of –14% and –28.6% respectively and was mainly driven by the high portion of low capitalized IPO firms in the sample. Much stronger long run underperformance was observed by Seitibraimov (2012) in Eastern European frontier markets like Russia, Ukraine and Kazakhstan. Using the local market indexes as benchmarks, the author found for 110 IPO stocks issued during the period from 1996 to 2010 a significant negative three-year excess return. Nevertheless, while the Russian IPO stocks underperformed their reference index on average by –47.3%, the rates of excess return in the Ukraine and Kazakhstan amounted for –100% and –94.52% respectively.

In contrary to other regions of the world, the long run performance of IPO stocks in Asia tends to vary strongly from one local market to another. Kumar (2007) found a three-year annualized return of –14.69% for 21 IPOs placed in the bookbuilding process on the Indian market between 1999 and 2004. The author also noted a significant negative excess returns for shorter holding periods. However, a later Study conducted by Sahoo and Raib (2010) shows substantially different results. For the sample comprising of 92 IPOs issued on the National and Bombay Stock Exchange between 2004 and 2006 the authors found on average a flat excess return for a period of three years from the date of the first list-

ing. In Thailand, Vithesonthi (2008) and Komenkul et al. (2012) reported a significant underperformance of IPO stocks in comparison to the local SET index. For 123 IPOs placed between 2000 and 2005, Vithesonthi found a three-year excess return of –38.7%. In addition, the author reported negative performance of IPO stocks in all Thai industries. Komenkul et al. (2012) studied 136 IPOs launched at the Stock Exchange of Thailand between 2001 and 2012 and found a three-year buy and hold abnormal return of –16.6% and an analogue cumulated average abnormal return of –19.6%. Furthermore there is also an evidence for a negative long run IPO performance in the Indonesian stock market. Emasari and Tamara (2010) investigated 112 IPOs, which have been subsequently listed on the Jakarta stock exchange during the period 1996 to 2001. Using the Jakarta Composite index as benchmark, the authors found the three-year underperformance amounting of –68%. Likewise, the IPO stocks issued in Turkey between 1990 and 1997 experienced a drop in excess return on a comparable scale. Ozden (2005) reported that the new listed securities underperformed the local stock exchange composite by a remarkable –63% for a period of 36 months from the date of the first listing.

Although in the majority of developing economies the long run excess return of newly listed stocks is on average negative, in several Asian countries the IPOs do not tend to underperform the local markets. As early as in 1990, Kim and Lee documented for 99 Korean IPOs a slight positive three-year excess return of 2%. More recent studies about the Chinese stock market show substantial positive stock price reaction in the long run. Xia and Wang (2003) examined 146 A-shares issued between May 1997 and December 1998 and found a three-year outperformance amounting in average of 25.91%. Chi and Padgett (2005) documented for the same observation period an excess return of 10.7%. In addition the authors reported that the high volume and the state participation affected negatively the aftermarket performance of studied stocks. Also Su et al. (2011) found substantial outperformance of 936 large Chinese IPO launched between 1996 and 2005 at the Shanghai and Shenzhen stock exchange. Using matching firms as benchmark, the authors documented an average excess return of 8.6% in three years and 4.6% in two years after

the first listing day. Another important emerging market showing a significant outperformance of IPO stocks in the long run is the Malaysia Stock Exchange. According to Nurwati et al. (2007) the local IPOs placed in the 1990s were followed by three-year average excess return of 17.86%.

Table 3

Long run IPO studies regarding the largest emerging markets
– grouped by regions: Latin America, Africa, Emerging Europe and Asia

| Author(s) | Country | Sample period/size | Approach | Benchmark | 3-year excess return (%) |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Aggarwal et al. (1993) | Brasilen Mexiko Chile | N = 62 N = 44 N = 28 1979–1990 | CAR | The respective national market index (BOVESPA, IPC, IPSA) | −47.0 −19.6 −23.7 |
| Celis/Maturana (1998) | Chile | N = 18 1991–1995 | CAR | Global Index of Chilean Electronic Stock Exchange | 9.8 |
| Govindasamy (2010) | South Africa | N = 229 1995–2006 | BHAR CAR | Johannesburg Stock Exchange All Share Index | −50.0 −47.0 |
| Rekik/ Bouyelbene (2013) | Tunisia | N = 40 1992–2008 | CAR | Tunisian Stock Exchange Index | −3.02 |
| Lyn/Zychowicz (2003) | Poland Hungary | N = 66 N = 25 1991–1998 | BHAR | WIG (Polish Stock Exchange) BUX (Hungarian Stock Index) | −24.4 −4.92 |
| Darmetko (2009) | Poland | N = 101 1998–2005 | BHAR | WIG (Polish Stock Index) Size und Book to Market matching firm portfolio | −31.07 −42.59 |
| Zielinski (2013) | Poland | N = 263 1994–2005 | BHAR | WIG (Polish Stock Index) Market portfolio (eq-weighted) | −14.0 −28.6 |
| Seitibraimov (2012) | Russia Ukraine Kazakhstan | N = 66 N = 11 N = 16 1999–2008 | BHAR | The respective national market index (RTS, PFTS, KAZE) | −47.3 −100.0 −94.5 |
| Ozden (2005) | Turkey | N = 134 1990–1997 | BHAR | Istanbul Stock Exchange Composite | −63.0 |
| Xia/Wang (2003) | China A-Shares | N = 146 1997–1998 | CAR | Shanghai A-Share Index Shenzhen A-Share Index | 25.9 |

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Chi/Padgett (2002) | China A-Shares | N = 409 1996–1997 | BHAR logarithm. | Shanghai A-Share Index Shenzhen A-Share Index | 10.7 |
| Chi at al. (2010) | China A-Shares | N = 897 1996–2002 | BHAR | Shanghai A-Share Index Shenzhen A-Share Index | 16.6 |
| Su et al. (2011) | China A-Shares | N = 936 1996–2005 | BHAR | Shanghai A-Share Index Shenzhen A-Share Index | 8.6 |
| Emasari/Tamara (2010) | Indonesia | N = 112 1996–2001 | BHAR | Jakarta Composite Index | −68.02 |
| Kumar (2007) | India | N = 21 1999–2006 | BHAR | S&P CNX Nifty Stock Exchange of India | −14.7 p.a. |
| Sahoo/Raib (2010) | India | N = 92 2004–2006 | BHAR | National Stock Exchange and Bombay Stock Exchange | 0.4 |
| Nurwati at al. (2007) | Malaysia | N = 435 1990–2000 | BHAR | Kuala Lumpur Composite Index | 17.9 |
| Vithesonthi (2008) | Thailand | N = 123 2000–2005 | BHAR | SET Index – Stock Exchange of Thailand | −38.7 |
| Komenkul et al. (2012) | Thailand | N = 136 2001–2012 | BHAR CAR | SET Index – Stock Exchange of Thailand | −16.6 −19.6 |
| Kim/Lee (1990) | South Korea | N = 99 1985–1988 | CAR | KSE Index (Korea Stock Exchange) | 2.0 |

p.a. – per annum; eq-weight. – equally weighted.
BOVESPA – Brasil Sao Paolo Stock Exchange Index; IPC – Mexico's Primary Stock Index; IPSA – Chilean Selective Stock Price Index; RTS- Russian Trading System Index; PFTS – Ukraine Stock Exchange; KAZE – Kazakhstan Stock Exchange.

Source: authors own elaboration.

The assembled results of empirical studies do not indicate any substantial dissimilarity in the long-run excess return of IPO stocks across different regions. Admittedly, the lowest underperformance was found in Asian markets, but even this region is not free of local stock exchanges characterized by significant negative return after equity listings. However, it is the maturity of the capital markets, which basically influences the security price behavior in the first three years of listing. Consequently, underperformance in frontier markets tends to be larger, than in the established emerging markets. In addition underperformance of IPO stocks in countries like Chile, India, Thailand and Poland has decreased over time, reflecting growing investor trust and the positive changes in the local market transparency.

## 5. Some theoretical and empirical explanations for the long-term IPO underperformance

There are several theoretical explanations for the aftermarket underperformance of IPO stocks. Probably the most common one is the Window of Opportunity Hypothesis, which establishes the relationship between the timing of issue and the underperformance. Ritter (1991) and Loughran and Ritter (1995) argue that the firms, that successfully time their security issues during a high valuation period, yield low returns for the investors in the long run.[10] The studies indicate that taking advantage of strong demand in the primary market enables overpricing of offered stocks. Sometimes even start-up companies without having substantial growth prospects manage to raise capital from the market at exorbitant prices.[11] However, as the market adjusts with real valuation, the excessive high stock prices drop substantially. Another possible explanation of the long term underperformance is provided by the Impresario Hypothesis. It argues that by underpricing of IPOs, the investment banks are able to produce more demand for the issue. Underpricing should also help in creating a secure return for the investors on the initial day. In this way, investment bankers manage to create an illusion that the brokers and underwriters are giving good investment recommendation.[12] According to this theory the initial return and aftermarket underperformance move in the same direction: The more the magnitude of underprice, the lower are the following long term IPO returns. The Divergence of Opinion Hypothesis introduced by Miller (1977) suggests that divergence of expectations or uncertainty about an IPO can lead to more overvaluation on the listing day and subsequently to underperformance in the long run. This theory is based on the establishment that the long run underperformance and magnitude of divergence of opinion are positively correlated and the most optimistic investors tend to buy newly issued IPO stocks

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[10]  See J.R. Ritter, *op.cit.*, p. 4; T.J. Loughran, J.R. Ritter, *op.cit.*, p. 47.
[11]  See S. Sahoo, P. Raib, *After Market Pricing Performance of Initial Public Offerings: Indian IPO Market 2002–2006*, "Vikalpa" 2010, No. 4, Vol. 35, p. 30.
[12]  According to R.J. Shiller, *Speculative Prices and Popular Models*, "Journal of Economic Perspectives" 1990, No. 2, Vol. 4, p. 58.

on primary market.[13] Hence a difference in opinion among the investors emerges as a result of uncertainty about quality and pricing of IPOs, leading finally to overvaluation on the listing day. Once the information flows to the secondary market, divergence of expectation gets narrowed down and substantial corrections in the stock prices occur.

Table 4

Explanations of long-run aftermarket underperformance of IPO stocks

| Author (year) | Variable | Implication on aftermarket excess return in the long run |
|---|---|---|
| Ritter (1991), Bhabra/Pettway (2003) | Age of firm | Younger IPO firms underperform stronger than the established firms in the long run |
| Brav/Gompers (1997), Carpentier at al. (2010) | Size of firm | Poor long-run performance is found negatively related with the size of the IPO firms |
| Ritter (1991) Levis (1993) | Underpricing | The higher is the initial day return, the worse is the long-run performance |
| Ritter (1991), Brown (1999) | Industry affiliation | Depending on the sector affiliation the long run excess return can differ significantly between IPO stocks |
| Jain/Kini (1994), Peristiani/Hong (2004) | Ownership retention | Significant positive relation between after-market price performance and equity retention by original shareholders |
| Brav/Gompers (1997), Brav et al (2000) | Offer size | Long-run IPO underperformance is found stronger for smaller firms |
| Eckbo/Norli (2006), Hoechle/ Schmid (2007) | Leverage | IPOs with high leverage ratio outperform in the long run compared to the low levered IPOs |
| Aggarwal/Rivoli (1990), Agarwal et al. (2008) | Subscription rate | IPOs with high initial demand documents negative long-run excess returns |

Source: Sahoo and Raib (2010), modified by the author.

Independently of the theoretical literature, numerous researchers have empirically examined the determinants of IPO underperformance.[14] They evidenced that company size, age and stock underpricing

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[13] According to E.M. Miller, *Long Run Underperformance of Initial Public Offerings: An Explanation*, Working Paper, University of New Orleans, New Orlean 2000, p. 4.

[14] For example see B.E. Eckbo, O. Norli, *Liquidity Risk, Leverage and Long-Run IPO Returns*, "Journal of Corporate Finance" 2006, Vol. 11, pp. 1–35; J.R. Ritter, *op.cit.*, pp. 3–27; B.A. Jain, O. Kini, *The Post- Issue Operating Performance of*

usually bear significant impact on the aftermarket excess return. Also factors like industry affiliation, ownership retention, offer size, leverage and subscription rate were found to be significant in explaining long-term underperformance. In some industries even research and development spending as well as pre-IPO profitability play a key-role in the interpretation of the stock price behavior in the first years after the stock issue.[15]

## Conclusions

This brief survey has discussed results of various empirical studies about the performance of IPO stocks in the long run. Summarizing it, the magnitude of underperformance over three years after security issue differs strongly across the investigated countries. Remarkable fact is, that in the recent years the relative slump in price of IPO stocks was in average weaker, than it used to be two or three decades ago. Moreover the excess return obtained from developed markets tends to be higher in comparison to larger emerging markets, but lower compared to frontier markets. An objective comparison of empirical results proved to be difficult due to different sample size, length of the investigation period, calculation methodology and benchmarks. In addition, not all available studies have been considered in the survey, leaving space for a pinch of subjective influence on the overall picture. Nevertheless, the overview consisting of 40 studies from 29 countries shows unambiguously that, with exemption of few local markets, the phenomenon of long-run underperformance of IPOs has existed over the last three decades all over the world.

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[15] See H. Bhabra, R. Pettway, *op.cit.*, p. 384.

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