

THE P/E EFFECT ON THE CROATIAN STOCK MARKET

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Abstract

This paper is examining the proposition that portfolios of stocks with lower P/E ratios beat portfolios of stocks with higher P/E ratios as well as the aggregate market portfolio of Croatian equities. Testing for the P/E effect in Croatia from 2005 to 2016 revealed that none can be found. Risk adjusted returns of the individual portfolios appear to be distributed randomly, regardless of their P/E level and number of securities. Still, all examined portfolios performed better on a risk-adjusted basis than an equally weighted aggregate market portfolio. This is because the returns of the market portfolio are brought down by companies with negative earnings (negative P/E ratios), which were excluded in the individual portfolios. So, while a clear connection between the level of P/E and subsequent returns could not be found, it seems that in Croatia investors would benefit simply by not selecting negative P/E stocks in their portfolios.

Key words: P/E ratio, Investing, Croatian stock market

1. INTRODUCTION

The P/E effect points to an anomaly in the Efficient Market Hypothesis (EMH) and implies that buying stocks with low P/E ratios can earn abnormal returns even when adjusted for risk. While the existence of the P/E effect has been noted earlier (Nicholson, 1960), it was S. Basu and his 1977 and 1983 landmark studies that finally attracted academic attention. Since then, extensive research has been conducted all over the world testing this proposition.

The notion that stocks with low earnings per share in relation to their current market price are possibly undervalued and therefore more likely to achieve above-average returns was a facet of investing known to market practitioners many decades before Basu. The approach was popularized by B. Graham and D. Dodd in their investment classic “Security analysis” from 1934 and was further fortified with Graham’s sequel “The Intelligent Investor” from 1949. The main premise of this strategy is that markets are not efficient all the time, but every now and then succumb to psychological pressures (depression/euphoria) and bring stock prices to unwarranted levels in relation to their fundamentals. Since earnings are the main driving force behind stock movements, the P/E ratio can be used as a simple “rule of thumb” gauge of stock valuation. Stocks with lower ratios can be seen as potential investment opportunities, especially after fierce market downturns, and stocks with higher P/Es as possibly overpriced, more so after periods of prolonged market euphoria. Building on this rudimentary notion the field of “fundamental stock analysis” developed, which over time in the search for the proper valuation of a company reached dizzying levels of complexity.

Basu essentially confirmed this age-long simple investment maxim in an academically accepted manner: a well-diversified portfolio of stocks with low P/E ratios, periodically balanced, can achieve returns higher than predicted by the EMH, even without bearing extra risk. Defying not only EMH but fundamental analysis as well, no other quantitative or qualitative input was required to achieve this. The countless numbers of follow-up studies in later decades, using earnings, book value and other fundamental variables in relation to price, more or less supported Basus’ findings, especially on developed markets. Today, there seems to be little doubt in the academia that this so-called “value effect” has a significant role in explaining stock returns.

While the P/E anomaly has been tested to death on developed markets in the last 40 years, and more and more on emerging markets also, to the knowledge of the authors no such study has been conducted on Croatian stocks. The domestic equity market is functioning actively for a quarter of a

century now, but Croatia is still only classified as a frontier market (MSCI, 2016). Even after a few milestone events, that were at that time deemed as turning points - the listing of domestic blue-chips Pliva and Zagrebačka banka on the London and Zagreb stock exchanges in 1996, and the IPOs of national giants like the oil & gas company INA and telecom operator HT in 2006/07 - the Croatian equity market remained mostly in a quiet niche of the domestic financial market. It never gained true significance as an important source of corporate financing and never attracted major interest of the broader public, which is seen in the persistent low annual stock turnover of around 1% of domestic GDP, compared to 7% for the region Central Europe and the Baltics and 50% for the EU (World Bank, 2015).

It is probably because of the minor importance the stock market holds for the national economy that equity phenomena are scarcely examined in domestic studies. In today's interconnected world any new investment insight is quickly scrutinized and adopted, so obviously the P/E anomaly must be common knowledge among domestic market practitioners and academics. Still, no formal research has been publicized about the effectiveness of such an approach on the Croatian equity market. Are stocks with lower P/E ratios better investment opportunities than stocks with higher ratios? Can a portfolio of low P/E stocks beat a diversified aggregate market portfolio? The aim of this paper is to give answers to those questions and provoke further research on these and similar capital market topics in Croatia.

2. BRIEF LITERATURE OVERVIEW

Jaffe, Keim, Westerfield (1989) picked up on Basu's research for US stocks extending the time frame from 1951 to 1986. They came to the same conclusion: portfolios of stocks with higher earnings yields¹ achieve higher returns than stocks with lower earnings yields. They also, somewhat surprisingly, found that stocks with negative earnings, grouped separately, outperformed many of the other portfolios with positive earnings. Fama and French (1992) confirmed these findings for US stocks from 1963 to 1990 - positive abnormal returns are associated with stocks with higher earnings yields (lower P/E ratios), but the book-to-market effect was even stronger (stocks with lower P/B ratios have superior performance over stocks with higher P/B ratios). In 1994 Lakonishok, Shleifer and Vishny compared "value" and "glamour" stocks in the US from 1968 to 1990. The term "value stocks" generally refers to stocks that have low prices relative to measures of fundamental value like earnings, dividends, book assets or sales. In contrast, "glamour" stocks have higher prices in relation to fundamentals. The study showed that in the given period value strategies significantly outperformed glamour strategies. Hawawini and Keim (1997) investigated stocks from 1962 to 1994 and confirmed the P/E effect from previous studies for the US but they also summed up various international researches on that subject. They concluded that the evidence for the P/E anomaly outside of the US is more varied. The P/E effect was documented in the UK, Japan, Singapore and Taiwan, while no such evidence could be found for New Zealand and South Korea. Jeremy Siegel (2014) focused only on the constituent stocks of the S&P 500 index and ranked them into five groups according to their P/E level. For the time period 1957 to 2012 portfolios with lower P/E ratios outperformed the higher P/E portfolios by 3-5% annually. Investing in S&P 500 stocks with lower P/E ratios turned out to be a market beating strategy as well, because low P/E portfolios beat the aggregate S&P 500 portfolio by a margin of almost 2-3% annually.

While the case for the P/E anomaly is relatively strong for developed countries, the results for emerging markets are not so clear-cut. Gursay and Aydoğan (2000) consulted the IFC (International Finance Corporation) Emerging Stock Markets Factbook from 1986 to 1999 for 19 emerging markets. Their results indicate that both P/E and P/B ratios have predictive power for future returns, especially over longer time periods, hence can be used as tools in forming market timing strategies in emerging equity markets. Akdeniz, Altay-Salih and Aydoğan (2000) investigated the cross section of stock returns in the Turkish market for the period 1992 to 1998. They found that book-to-market and firm size explain stock returns, whereas no significant P/E effect is encountered. Mahmood and Fatah (2007) examined the relationship among stock returns, dividend yields and P/E ratios in Malaysia

¹ Earnings yield (E/P) is the inverse P/E. Higher earnings yield means lower P/E.

from 1989 to 2005. The study presented evidence that these fundamental variables can explain subsequent stock returns, both in the long- and short run, and therefore can be useful to investors in deciding their investment strategies. Aras and Yilamz (2008) investigated different explanatory variables for returns in 12 emerging stock markets from 1997 to 2003. While the market-to-book ratio was the most significant predictive variable in explaining stock returns, followed by the dividend yield, the P/E ratio had the weakest relation to future returns. More so, except for Argentina and Turkey, the direction of the relationship between P/E ratios and returns was positive, meaning that higher P/E levels led to higher returns in the examined period.

3. DATA AND METHODOLOGY

Data on stock prices, earnings and dividends for this paper were collected from publicly available sources like the Zagreb Stock Exchange (ZSE) and the web portal MojeDionice.com, which specializes in collecting fundamental data on listed Croatian companies.

In searching for the P/E effect in Croatia the focus was narrowed to include only stocks that at the respective time were constituents of the main domestic equity index CROBEX². The main reason for this is liquidity, or the lack thereof. There were approximately between 100 and 200 listed stocks at the ZSE at certain intervals in the observed period from 2005 to 2016, but most of them could not be considered liquid on even the most liberal terms. Average daily turnover in the last few years is limited between 1 and 2 million euros and concentrated in only a few stocks. In 2015, for example, 46% of the total annual turnover was done in only 5 companies, and 61% with the 10 most liquid stocks (Zagrebačka burza, 2016). Looking beyond CROBEX constituents as asset allocation targets and for portfolio management purposes would prove very difficult for any investor with meaningful funds. The bid/ask spread can be wide even for some CROBEX members, let alone for securities outside the main index. High transaction cost in non-index members would thus render this analysis useless for any practical purposes.

Also, stocks with negative P/E ratios were excluded in this research. Companies that are reporting negative earnings are most likely faced with temporarily or long standing problems and therefore very difficult to value conventionally. They are probably better left to specialized and sophisticated investors which deal in niches like “distressed securities”. Many studies on the P/E effect exclude them completely or group them separately. Still, this paper will capture the impact of stocks with negative earnings when comparing the results of individual portfolios with an equally weighted aggregate market portfolio, which by definition must include negative P/E stocks.

The portfolios were constructed and annually rebalanced at the last trading day in March, starting from March 31st 2005 and ending with March 31st 2016. The end of March was chosen for two specific reasons, instead of the perhaps more obvious December 31st or January 1st. First, the new CROBEX composition is known by then, since the ZSE schedules one of its periodic index revisions for every third Friday in March. Second, listed companies are required to publish their annual financial reports by the end of the first quarter. Therefore, it can be realistically assumed that, by the end of March, investors have an almost certain picture of previous year earnings and current P/E levels upon which they can base their investment decisions. That would not be possible if the end or the beginning of the year were taken as a starting point.

P/E ratios of CROBEX stocks were calculated based on their closing price on the last trading day in March, or, if not available, the last closing price prior to that. Earnings per share were taken from the previous calendar year. For example, the P/E ratio for Podravka for 2007 was calculated by dividing its closing price on March 31 2007 with its earnings per share for 2006. In any given year, stocks were ranked according to their P/E level, from lowest to highest, and grouped into five portfolios: the first quintile portfolio from stocks with the lowest P/E ratios and the fifth quintile portfolio from stocks with the highest ratios (negative P/Es were excluded). It is assumed that the portfolios are equally

² The authors kindly thank the ZSE for providing them with the historical composition structure of the CROBEX for the purpose of this research.

weighted, i.e., an equal nominal amount of funds is hypothetically invested in every stock of the respective portfolios.

The five portfolios were held for exactly one year after which the total return of every stock (price appreciation/depreciation + cash dividend received) and individual portfolio return were determined. The portfolios were then rebalanced: based on the new CROBEX composition stocks were again grouped into five portfolios according to their P/E levels and held until next year. This procedure was repeated for 11 observations (years) with a final sale of every stock in every portfolio on March 31st 2016. For all portfolios the arithmetic mean of returns from 2005 to 2016 was then calculated, along with their standard deviation as the chosen measure of risk. In order to adjust the returns for risk the Sharpe ratio for the individual portfolios was determined according to following formula (Investopedia, 2016):

$$\text{Sharpe ratio} = \frac{\bar{r}_p - r_f}{\sigma_p}$$

Where:

$\bar{r}_p$ = Mean portfolio return

r_f = Risk free rate

σ_p = Portfolio standard deviation

The risk-free rate in the Sharpe ratio was derived as the average of 3-month Treasury bill yields from all auctions held at the Croatian Ministry of finance from 2005 to 2016 (Ministarstvo financija, 2016).

Arithmetic returns are not ideal in assessing the nominal amounts these portfolios would have actually made/lost in the period 2005 to 2016 for hypothetical investors. Instead, geometric returns are more relevant for investor wallets because they account for the compounding effect. After determining the geometric returns for the quintile portfolios, they are compared to the risk it took to achieve them. A common measure of risk in the asset management industry is maximum drawdown - the maximum loss from a peak to a trough of a portfolio, before a new peak is attained (Investopedia, 2016). To adjust geometric returns for maximum drawdowns the Return over Maximum Drawdown (RoMaD) ratio will be calculated according to following formula (Investopedia, 2016):

$$\text{RoMaD} = \frac{\text{Geometric portfolio return}}{\text{Maximum portfolio drawdown}}$$

Comparing Sharpe and RoMaD ratios across portfolios will indicate if there is any significant connection between risk-adjusted returns and the level of individual portfolios P/E. For additional confirmation, these results will also be compared to the risk-adjusted returns of an aggregate market portfolio. The natural candidate would be the official capitalization-weighted CROBEX index. But total returns for the individual portfolios can only be compared to total returns of the CROBEX. The problem is that CROBEX total returns are only available from 2012 onwards. Therefore, it is assumed that the aggregate market portfolio is not a capitalization- but an equally-weighted portfolio of every CROBEX constituent, negative P/E members included. This allows then for the manual calculation of total aggregate market returns and comparison with the total returns of the quintile portfolios.

Considering the fact that most liquid stocks on the ZSE are concentrated in the CROBEX, a methodology that divided this already small sample³ into five different portfolios naturally led to a very small number of stocks in every portfolio. On average, these portfolios consisted of only 3 to 4 stocks, which is far from achieving any diversification benefits. So in an additional step CROBEX constituents were divided into three groups instead of five, increasing thereby the number of stocks per portfolio to 6 to 7 on average. This would in practice be more realistic than the former approach, and in Croatia probably the most one could try to diversify without holding the aggregate market portfolio.

³ In the observed period, the CROBEX was on average comprised of about 20-25 companies.

The complete procedure described above using quintile portfolios was then repeated with tercile portfolios.

4. RESULTS AND ANALYSIS

Table 1. ranks the portfolios based on P/E levels from lowest to highest and presents the corresponding performance measures like average annual returns, standard deviations and the Sharpe ratio. The same is shown for the equally weighted CROBEX portfolio.

Table 1. Arithmetic return, standard deviation and Sharpe ratio for quintile portfolios (2005-2016)

Portfolios	Lowest P/E	2nd quintile	Mid P/E	4th quintile	Highest P/E	CROBEX equally
Median P/E	6,94	11,71	17,53	30,61	84,25	12,48
Average annual return	10,18%	6,20%	11,47%	9,35%	13,48%	5,51%
Standard deviation	36,73%	33,24%	30,42%	42,78%	40,75%	33,82%
Sharpe ratio	0,1945	0,0950	0,2770	0,1475	0,2562	0,0731

Source: authors' calculation

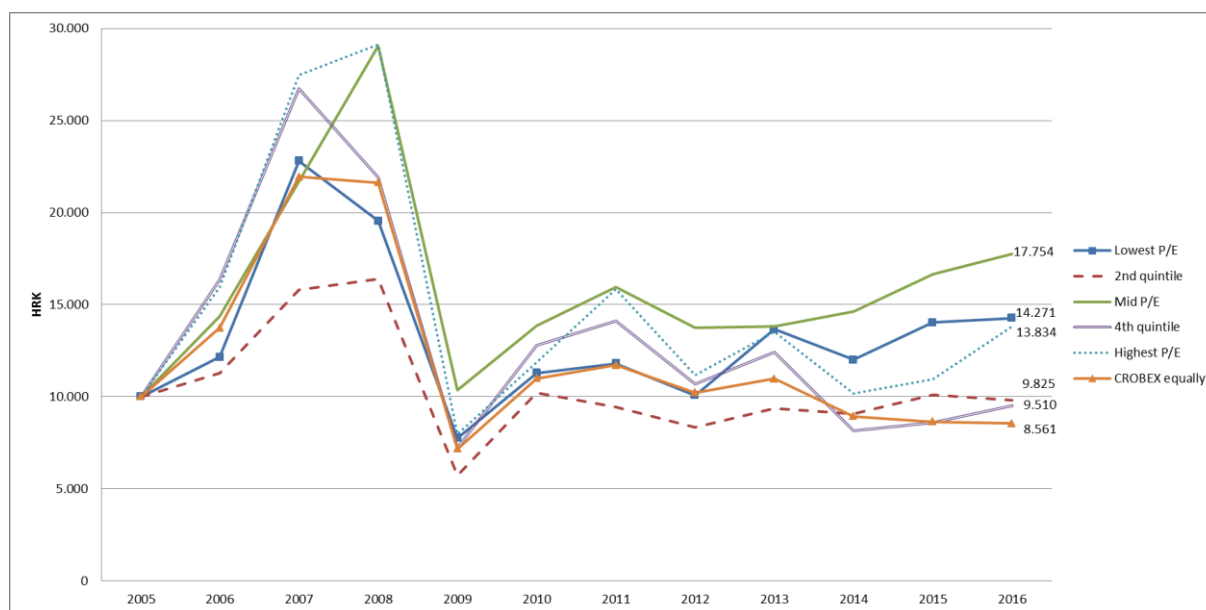
It is immediately evident from Table 1. that there is no clear pattern in the level of P/E and realized average returns in Croatia in the researched period. Portfolios with lower P/E ratios do not produce higher returns than portfolios with higher ratios, as research in developed markets, especially the US, would suggest. Moreover, the highest average return (13,48%) was obtained by the portfolio with the highest median P/E value (84,25), while the lowest return (6,2%) was recorded by the second “cheapest” portfolio which had with a median P/E of only 11,71. The lowest P/E portfolio was in terms of return beaten not only by the highest but also by the mid P/E portfolio. So observing only for average return and P/E level, if there is any relation at all, it is more likely a positive one – higher P/Es lead on average to higher returns and not the expected negative one (higher P/Es lead to lower returns) hinted at by international studies.

Also, it could be expected that higher returns were achieved by taking on more risk, but Table 1. points to a more or less random distribution of the risk/return relationships. For example, the second worst portfolio in terms of return (4th quintile portfolio) has the highest standard deviation (42,78%), while the lowest risk (30,42%) was recorded by the second best performing portfolio (mid P/E portfolio). The most important measure in Table 1. is the Sharpe ratio, because it adjusts returns for risk. The mid P/E portfolio scored the highest Sharpe ratio, returning 0,277 per unit of risk, with the highest P/E portfolio coming in a close second (returning 0,2562 per unit of risk). The lowest P/E portfolio is ranked only third based on a risk-adjusted basis, while the worst one with only 0,095 is the second “cheapest” 2nd quintile portfolio. So comparing the portfolios with the Sharpe ratio reveals that the P/E level of Croatian equity basically has no bearing on risk-adjusted subsequent returns.

The equally weighted CROBEX market portfolio has both the lowest return and the lowest Sharpe ratio, implying that it underperforms all quintile portfolios regardless of them having stocks with higher or lower P/E ratios. The main difference between the market portfolio and the individual portfolios is that the former includes all stocks of the index at respective observation points, even the ones with negative P/Es which are excluded from the quintile portfolios. Therefore, it can be reasoned that having stocks with negative earnings in one's portfolio can lead to lower overall returns, making a case for avoiding them altogether, especially for investors who tend to put a similar nominal amount in every stock they pick.

It was earlier noted that geometric returns are more representative for investors than arithmetic ones because they account for compounding. Figure 1. depicts the performance of 10.000 HRK (Croatian kuna) invested in 2005 in the individual portfolios and the CROBEX equally-weighted market portfolio.

Figure 1. Value development of quintile portfolios (2005-2016)



Source: authors' calculations

The mid P/E portfolio produced the best result in the nominal amount of HRK gained, followed by the lowest and highest P/E portfolios. The other three portfolios actually lost money, which is quite noteworthy because the observed period is a relatively long one (11 years) and dividends were included. No eye-catching connection here either, but those results will be closer looked at on a risk-adjusted basis in Table 2.

Table 2. Geometric return, maximum drawdown and RoMaD for quintile portfolios (2005-2016)

Portfolios	Lowest P/E	2nd quintile	Mid P/E	4th quintile	Highest P/E	CROBEX equally
Median P/E	6,94	11,71	17,53	30,61	84,25	12,48
Geometric return	3,29%	-0,16%	5,36%	-0,46%	2,99%	-1,40%
Max. drawdown	65,99%	65,02%	65,59%	72,98%	72,62%	67,34%
RoMaD	0,050	-0,002	0,082	-0,006	0,041	-0,021

Source: authors' calculations

While geometric returns differed widely across portfolios (from -0,16% to 5,36%), risk expressed as maximum losses from previous peaks in portfolio value is densely clustered from 65,02% to 72,98%. So in terms of risk the hypothetical investor would experience more or less similar losses but the returns would significantly differ based on the decision in what portfolio the funds were invested. Therefore, on a risk-adjusted basis the results are identical as when observed only with geometric returns – the best return over maximum drawdown recorded the mid portfolio (0,082), while returns are very similar for the lowest (0,05) an highest P/E portfolio (0,041). Even in this instance, when the analysis is performed from the perspective of a typical investor who is primarily concerned with compounded returns and maximum drawdowns, no obvious connection can be detected between risk-adjusted returns and P/E levels. With risk largely similar, returns deviated widely regardless of whether the portfolios were constructed of stocks with higher or lower P/E ratios. Here again, the equally weighted CROBEX market portfolio underperformed all other portfolios by a significant margin.

In order to achieve better diversification the above analysis will be repeated, but this time with only three portfolios. Performance measures of the tercile portfolios and the equally-weighted CROBEX market portfolio are presented in Table 3.

Table 3. Arithmetic return, standard deviation and Sharpe ratio for tercile portfolios (2005-2016)

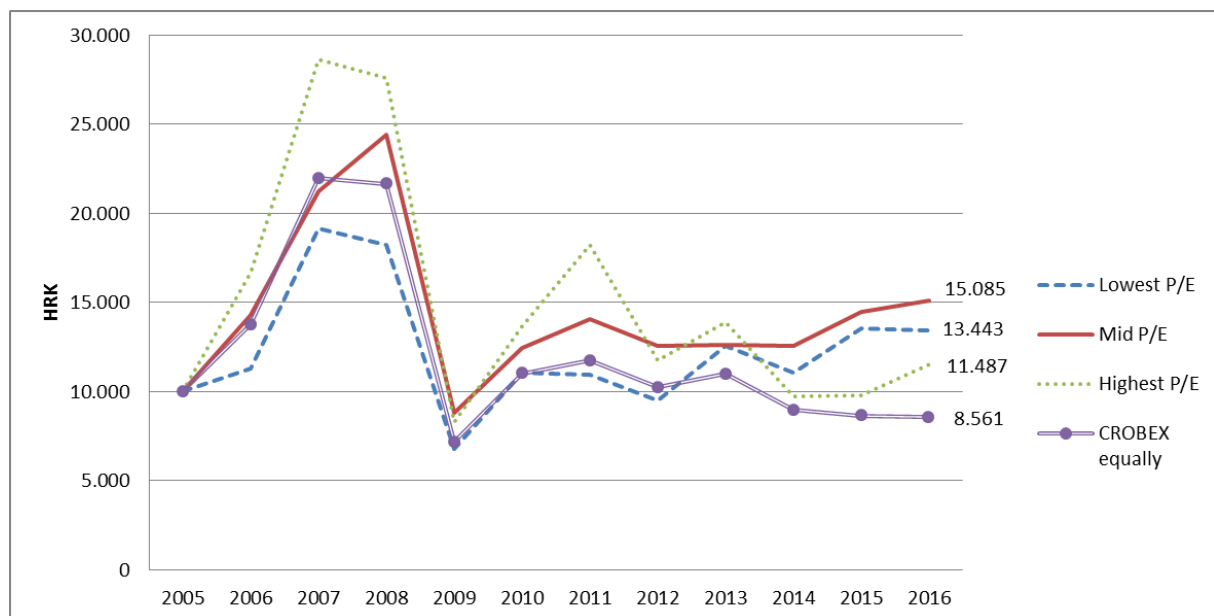
Portfolios	Lowest P/E	Mid P/E	Highest P/E	CROBEX equally
Median P/E	9,38	18,15	51,90	12,48
Average annual return	9,56%	9,62%	12,19%	5,51%
Standard deviation	35,30%	29,79%	43,71%	33,82%
Sharpe ratio	0,1850	0,2210	0,2090	0,0731

Source: authors' calculations

With only three portfolios analyzed, the winner in terms of average return is the portfolio with the highest P/E ratios, as it was the case when five portfolios were examined. This time, though, it comes with the highest standard deviation as well. But, most importantly, the returns on a risk-adjusted basis using the Sharpe ratio do not differ dramatically across the portfolios. If anything, it seems that higher P/E levels point to higher risk-adjusted returns, but not significantly so. All in all, it doesn't really seem to matter much in what portfolio to invest considering the subsequent returns. What is obvious again is the substantial outperformance of all three individual portfolios versus the equally weighted CROBEX portfolio.

In Figure 2. the development of every portfolio is simulated when considering compounding and starting with 10.000 HRK in cash in 2005.

Figure 2. Value development of tercile portfolios (2005-2016)



Source: authors' calculations

Like in the analysis with quintile portfolios, the highest nominal amount is gained by the mid P/E portfolio, followed by the "cheapest" and the most "expensive" portfolio. As noted before, the equally-weighted CROBEX portfolio actually lost money for the hypothetical investor. Table 4. shows the results on a risk-adjusted basis.

Table 4. Geometric return, maximum drawdown and RoMaD for tercile portfolios (2005-2016)

Portfolios	Lowest P/E	Mid P/E	Highest P/E	CROBEX equally
Median P/E	9,38	18,15	51,90	12,48
Geometric return	2,73%	3,81%	1,27%	-1,40%
Max. drawdown	64,48%	64,00%	71,12%	67,34%
RoMaD	0,042	0,059	0,018	-0,021

Source: authors' calculations

This is the only time in this study where the lowest P/E portfolio beat the highest P/E portfolio on a risk-adjusted basis by a significant margin. But the mid P/E portfolio, which has a median P/E of 18, finishes noticeably stronger than the lowest P/E portfolio with a median P/E of only 9. At first glance, the RoMaD of the three portfolios makes a certain point for avoiding stocks with much higher P/E ratios than average. But since this is not confirmed with other analyses it is difficult to back it up without reservation. Like in previous cases, the equally weighted CROBEX portfolio performed worst on practicably any account.

The persistence of substantially underperforming aggregate market portfolios raises the question whether the influence of negative P/E stocks is truly of such importance for stock returns in Croatia. To test for this, the performance of the equally weighted CROBEX portfolio is compared with the performance of the same market portfolio but with negative P/E stocks excluded. The results are in Table 5.

Table 5. Performance measures for CROBEX market portfolios (2005-2016)

	CROBEX equally	CROBEX equally w/o negative P/E
Median P/E	12,48*	17,31
Average annual return	5,51%	10,36%
Standard deviation	33,82%	34,41%
Sharpe ratio	0,0731	0,2130
Geometric return	-1,40%	3,22%
Max. drawdown	67,34%	65,57%
RoMaD	-0,021	0,049

*The median P/E for the all-inclusive CROBEX portfolio is lower than the one with negative P/Es excluded because negative P/E ratios drag the median down, thus creating an artificially low P/E not comparable with the positive P/E portfolio.

Source: authors' calculations

Table 5. clearly shows the vast performance superiority of an aggregate market portfolio with negative P/E stocks excluded. Such a market portfolio, composed of only positive P/E stocks regardless of their level, would compete comparably with the individual P/E portfolios examined in this paper. There is no doubt that, on average, owning stocks with negative earnings did not help the Croatian investor in the time period 2005 to 2016.

In the end, a quick recap of the four analyses is given. With five portfolios investigated, the Sharpe and RoMaD ratios were more or less randomly distributed across the various P/E levels, while with three portfolios the Sharpe ratio was very similar for all levels and only the RoMaD suggested avoiding stocks with the highest P/E ratios. But with this being the only exception, the different analyses basically confirmed the prevailing impression that risk-adjusted stock returns in Croatia do not relate to the level of their P/E ratios. One interesting additional observation was made though, namely that the mid P/E portfolio was the winner in every single instance researched. Can it hence be

concluded that it is best to own Croatian stocks with a P/E ratio of about 17-18? Since there is no rational explanation why this would hold in the real world of investing, this would truly be a much stretched conclusion. In the absence of a reasonable interpretation, randomness is probably the best answer. Anything else might lead investors to the illusory path of optimization.

5. CONCLUSION

Searching for a possible P/E effect in Croatia in the period 2005 to 2016 revealed that no such effect could be found. Whether by using arithmetic or geometric returns, Sharpe ratios or Returns over maximum drawdowns, smaller or larger portfolios, no clear-cut relation could be observed between the level of P/E and subsequent risk-adjusted returns. It appears that in Croatia the level of P/E has no bearing whatsoever on realized returns. This goes against the body of research conducted on developed markets, especially the US, where the so called “value” effect has long been documented and to some extent embodied in academic capital market models (Fama-French three factor model). Paradoxically, given its level of minuscule liquidity, it also strengthens the case for an efficiently functioning market in Croatia. It seems that in trying to explaining stock returns in Croatia one has to turn to factors other than the P/E ratio.

Evidence is strong, though, for avoiding stocks with negative earnings (i.e. negative P/E ratios). An equally weighted market portfolio of all CROBEX constituents performed markedly weaker on a risk-adjusted basis on every instance than the individual portfolios constructed with stocks with only positive earnings, regardless of their P/E level. Since the market portfolio included every index constituent, which by definition also means stocks with negative earnings, the conclusion at hand is that the market portfolio returns were brought down by those negative P/E stocks. Indeed, when excluding negative P/E stocks from the equally weighted CROBEX portfolio, returns drastically improved and such a market portfolio performed correspondingly with other individual portfolios. While acknowledging that these results may not be indicative of future performance, the more conservative and/or more casual investor should probably skip negative P/E stocks and turn to companies with a history of positive earnings. More likely, investing in distressed equity is better left to specialized investors (funds) with a much higher levels of time commitment, risk management and know-how to handle such cases.

While many active market practitioners will always be searching for undervalued companies by screening for those with low investment multiples, the P/E ratio of Croatian stocks offered little guidance for them, at least not in the past. The obvious candidates for future research would thus be the P/B and the P/S ratio; book value and sales being fundamentals that are more stable and less prone to erratically changes like earnings per share. Also, one has to take into account the relatively short time frame analyzed. Like in many other emerging (frontier) markets a big handicap in research is insufficiently long data series. It could be plausible, for example, that this specific time period in Croatia proved unfavorable for the P/E ratio, something that could change in the future, though. This is not too far-reaching, because even in the US, the market with the longest available historical data, the value effect was not consistently present, year in – year out. It had periods of strong over performance and times of relative underperformance which could last for years, even decades. Only time will tell if this effect will shine on the Croatian market one day.

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