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Contrarian Factors in Frontier Markets

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Summary

The objective behind this thesis is to test whether certain contrarian factors can predict long-term stock returns in frontier markets. We do this by measuring simple, observable variables and their effect on returns 1 to 5 years ahead. The study is based on Skagen Funds investment strategy, which seeks to overweight under-valued, under-analyzed and unpopular companies. To identify under-valued companies, we have used price-book and price-earnings measures. For under-analyzed and unpopular, we have used analyst coverage and analyst consensus. In addition, we included index weight as a proxy for size to avoid potential issues with endogeneity.

To secure unbiased estimators we control for fixed effects using dummy variables. In addition to this, we estimate standard errors by double clustering to avoid downward biased standard errors.

Our results conclude that price-book and index weight are significant determinants on long-term returns. We to do not find that analyst consensus or recommendations affect returns. This indicates that no superior returns can be obtained from buying under-analyzed and unpopular companies. This may however also be due to the choice of wrong proxies. With few exceptions, our results have also been tested to be robust across different regions and sectors.

With this research, we make several contributions to the literature:

- We believe that we are the first to test the long-term relationships between contrarian factors and long-term returns in frontier markets.
- We believe that we are the first to test such relationships after the financial crisis, regardless of holding periods.
- As far as we know, we are also the first to use double clustering of standard errors while studying overlapping returns. As this approach increases the robustness of our results, we wish to encourage others to adapt this methodology in future research.

Acknowledgements

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Contents

1. Introduction

Previous research covers in great details how investors can benefit from diversification towards frontier markets[1]. Research shows that due to low world market integration, what seems as high systematic risk, is to some degree diversifiable. By decreasing volatility while maintaining expected return, global investors have been able to increase risk-adjusted return by including frontier markets in their portfolios. The characteristics of frontier markets also indicate that sophisticated and long-term investors are best positioned to benefit from exposure towards these markets. Consequently, institutional investors have good reasons to increase their exposure towards frontier markets.

While most of the research on frontier markets are on diversification benefits, less research has been performed on specific investment strategies, such as contrarian investing. During recent years, contrarian strategies has attracted much attention among academics and investors. Research shows that companies that have a low price compared to fundamental measures like book-values and earnings have yielded higher return than the broad market. This is usually referred to as the value effect.

In addition, some contrarian investors like our cooperating partner on this thesis, Skagen Funds, also focus on buying unpopular and under-analyzed companies[2]. This strategy can be considered as buying when other investors are negative and vice versa. It is uncertain whether buying unpopular and under-analyzed companies leads to superior returns. While relative value and analyst coverage can be quantified, finding good proxies for popularity is more difficult.

[1] Frontier markets are countries which satisfy a set of minimum requirements for size, liquidity and accessibility, but does not qualify as emerging markets or developed markets.

[2] Skagen Funds' investment strategy can be summarized as going long companies that are "undervalued, unpopular and under-analyzed". More precisely, they define themselves as a value investor, with long-term focus, with an investment horizon of typically 3 to 5 years. They are contrarian in a way that their "curiosity grows when others are negative". Their second largest fund, Skagen Kon-Tiki, has minimum 50 % exposure towards emerging markets, and during the past 5 years, they have had 2 to 5 % exposure towards frontier markets. Since the introduction in 2002, Skagen Kon-Tiki has experienced great success, with an annualized return of 14,21 % versus 8.68 % for their reference index, as of November 30th 2016. As a contrarian investor with a global focus, it is interesting to test whether their strategy works in frontier markets. For more information about Skagen Funds, we refer to www.skagenfunds.com

Based on Skagen Funds' investment strategy and evidence from other markets, the objective behind this thesis is to test whether there exists a relationship between contrarian factors and future returns in frontier markets. To quantify the relative valuation of companies, we have used price-earnings (P/E) and price-book (P/B). To quantify under-analyzed and unpopular, we have used the number of analysts covering each company and recommendation consensuses. Whether these are good proxies for popularity will be discussed in the end of our thesis.

Because it can be thought that analysts are more likely to cover large companies, strong correlation between analyst coverage and market capitalization might exist. By ignoring size, we risk that analyst coverage will show a significant effect on returns while the actual effect comes from size itself. Consequently, we have controlled for size by including index weights adjusted for free float market capitalization in our analyses.

Because frontier markets are known to be relatively illiquid and often highly regulated, we use long holding periods, ranging from 1 to 5 years. This represents an investment strategy which is more realistically implementable for institutional investors seeking to diversify their portfolios through frontier markets exposure. As we provide a top-down analysis to find significant factors, we also lay the ground works for active portfolio managers using bottom-up analysis based on a screening process.

As far as we know, only one study has been published on investment strategies in frontier markets. De Groot et al. (2010) tests whether there exists a relationship between short-term returns and measures like size, P/B and P/E in frontier markets from January 1997 to October 2008. With this research, we offer the following contributions to the literature:

- We believe that we are the first to test whether there exist long-term relationships between returns and P/E, P/B, size, and analyst coverage and consensus in frontier markets.
- Regardless of holding periods, we also believe that we are the first to test these relationships on post-financial crisis data, i.e. data from August 2008 to August 2016.
- Because longer time series of price data in frontier Markets are difficult to obtain, we are forced to use overlapping returns. This will create problems with autocorrelation, which lead to downward biased standard errors. We also have reason to believe that we get cross-sectional dependence, which is another source of such bias. To avoid

these problems, we have double clustered the standard errors by time and firm. As far as we know, this is the first study to use this technique on overlapping stock returns.

The thesis is structured as follows. In section 2, we present the characteristics of frontier markets and findings by others that laid the ground for our research. In section 3, we provide the reader with relevant asset pricing theory, presenting the traditional consumer based approach, and how this is related to the factor based approach that dominates a great part of the modern literature on asset pricing. Previous research on relevant relationships between our chosen independent variables and stock returns will also be presented. In section 4, we present the specific hypotheses that our thesis aims to test. Furthermore, we describe the data sample and methodology in section 5. The results are presented in section 6, followed by discussions and suggestions to further research in section 7. Concluding remarks will be presented in section 8.

2. Characteristics of frontier markets

In this section, we will present the main characteristics of frontier markets. To get a broad overview of the topic, we will cover the main similarities and differences, both within frontier markets, and between frontier, emerging and developed markets. We will start by presenting MSCI's definition of frontier markets.

2.1 MSCI's classification framework

Frontier markets currently do not have any universal definition, as index providers use different criteria for inclusion in their frontier indices. In this thesis, we have chosen to use MSCI's definition. However, all frontier economies are similar in the sense that they do not qualify as developed or emerging markets as they represent countries in need of significant improvement in several areas (Philips & Redding, 2013, p. 3).

MSCI's market classification framework separates countries into frontier, emerging and developed markets using three criteria listed in table 2-1. For inclusion in a specific market, all criteria should be satisfied. This means that sufficient increase in size, liquidity *and* access for foreign investors lead to reclassification to emerging markets. Countries that do not satisfy any category are classified as standalone markets.

Table 2-1: MSCI's classification framework.

Criteria	Frontier	Emerging	Developed
A Economic Development A.1 Sustainability of economic development	No requirement	No requirement	Country GNI per capita 25% above the World Bank high income threshold* for 3 consecutive vears
B Size and Liquidity Requirements B.1 Number of companies meeting the following Standard Index criteria Company size (full market cap)** Security size (float market cap)** Security liquidity	2 USD 635 mm USD 47 mm 2.5% ATVR	3 USD 1269 mm USD 635 mm 15% ATVR	5 USD 2538 mm USD 1269 mm 20% ATVR
C Market Accessibility Criteria C.1 Openness to foreign ownership C.2 Ease of capital inflows / outflows C.3 Efficiency of operational framework C.4 Competitive landscape C.5 Stability of the institutional framework	At least some At least partial Modest High Modest	Significant Significant Good and tested High Modest	Very high Very high Very high Unrestricted Very high

* High income threshold for 2015: GNI per capita of USD 12,736 (World Bank, Atlas method)
** Minimum in use for the May 2016 Semi-Annual Index Review, updated on a semi-annual basis

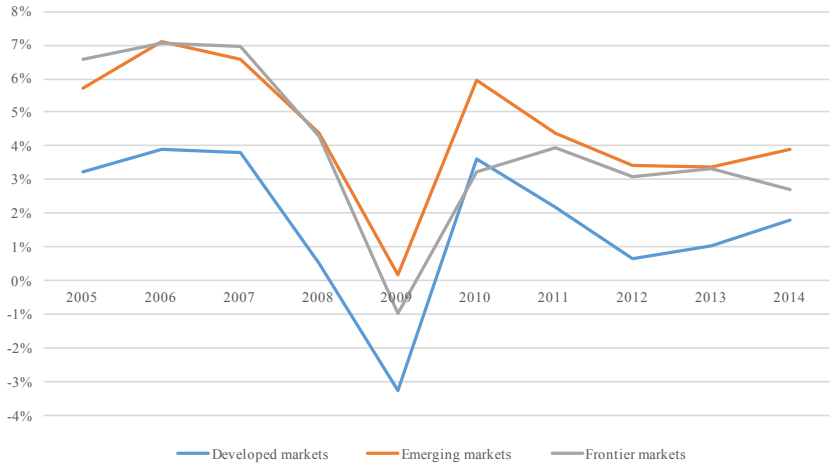
Shows the different criteria MSCI use to classify markets into developed, emerging, frontier. Countries not fulfilling any criteria are classified as standalone markets. Source: MSCI (2014).

2.1.1 Critera 1: Economic development

As table 2-1 illustrates, the first criteria in MSCI's framework is related to the level of economic development. For frontier markets, no specific level of economic development is required. Hence, frontier markets vary to a great extent when it comes to GDP per capita. As of August 31st 2016, MSCI frontier markets index consisted of 117 companies from 23 countries (Bloomberg, 2016a). According to World Bank (2016a), 7 countries was ranked as high income, 8 countries as upper middle income and 8 countries as lower middle income. In 2015, Kuwait had by far the highest purchasing power adjusted GDP per capita of USD 71 312 (World Bank, 2016b). Kenya ranked lowest, with USD 3082 per capita. The average and median purchasing power adjusted GDP per capita were USD 19 818 and 13 709, respectively. These numbers illustrate that frontier markets are highly diversified when it comes to economic development.

However, frontier markets in general are often associated with high economic growth. Figure 2-1 shows annual real GDP growth from 2005 to 2014. During this period, frontier economies experienced annual average and median growth of 4 %. During the same period, developed and emerging economies grew on average by 1,7 and 4,5 %, with a median growth of 1,8 and 4,8 %, respectively. Consequently, emerging and frontier markets seem relatively equal in sense of economic growth.

Figure 2-1: Average real GDP growth rates in developed, emerging and frontier markets.



Source: All numbers for developed markets, except for Hong-Kong and Singapore, are retrieved from OECD (2016). Numbers for Hong-Kong and Singapore are retrieved from IMF (2016). All numbers for emerging and frontier markets, except for Mexico, South Africa and Colombia, are retrieved from IMF (2016). Numbers for Mexico, South Africa and Colombia are retrieved from OECD (2016).

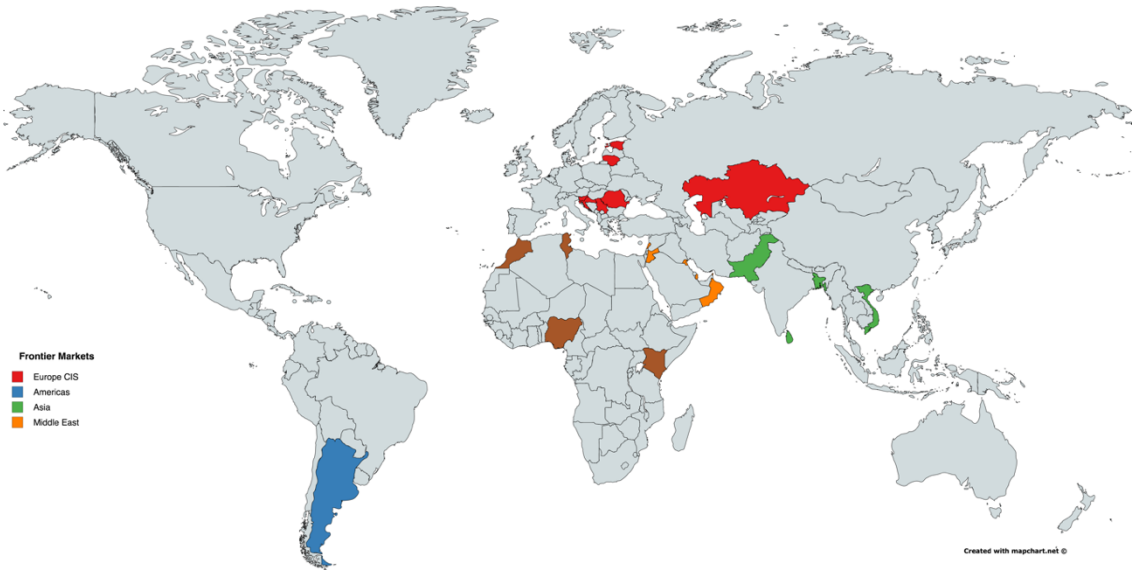
Table 2-2 illustrates that emerging and frontier markets are relatively similar in sense of geographical exposure. For instance, both categories have no exposure towards Western Europe and North America. However, MSCI Frontier Markets Index has some exposure towards some small Eastern European economies. This is not surprising, as MSCI's framework does not require any specific level of economic development for neither frontier nor emerging economies.

Table 2-2: Country classification by MSCI by August 31st 2016.

MSCI ACWI & FRONTIER MARKETS INDEX										
MSCI ACWI INDEX						MSCI EMERGING & FRONTIER MARKETS INDEX				
MSCI WORLD INDEX			MSCI EMERGING MARKETS INDEX			MSCI FRONTIER MARKETS INDEX				
DEVELOPED MARKETS			EMERGING MARKETS			FRONTIER MARKETS				
Americas	Europe & Middle East	Pacific	Americas	Europe, Middle East & Africa	Asia	Americas	Europe & CIS	Africa	Middle East	Asia
Canada United States	Austria Belgium Denmark Finland France Germany Ireland Israel Italy Netherlands Norway Portugal Spain Sweden Switzerland United Kingdom	Australia Hong Kong Japan New Zealand Singapore	Brazil Chile Colombia Mexico Peru	Czech Republic Egypt Greece Hungary Poland Qatar Russia South Africa Turkey United Arab Emirates	China India Indonesia Korea Malaysia Philippines Taiwan Thailand	Argentina	Croatia Estonia Lithuania Kazakhstan Romania Serbia Slovenia	Kenya Mauritius Morocco Nigeria Tunisia	Bahrain Jordan Kuwait Lebanon Oman	Bangladesh Pakistan[3] Sri Lanka Vietnam
			MSCI STANDALONE MARKET INDEXES[1]							
				Saudi Arabia		Jamaica Trinidad & Tobago	Bosnia Herzegovina Bulgaria Ukraine	Botswana Ghana WAEMU[2] Zimbabwe	Palestine	

Source: MSCI (2016a)

Figure 2-2 Countries in the MSCI Frontier Markets Index by August 31st 2016.



Source: MSCI (2016a)

2.1.2 Criteria 2: Size and liquidity

The second criteria in MSCI's classification framework is related to size and liquidity requirements. Griffith & Quisenberry (2010, p. 51) argue that some frontier markets are classified as frontier simply because the market capitalization is low. Table 2-3 shows the total market capitalization of the MSCI frontier markets index versus MSCI emerging markets index as of 31st August 2016. As seen, frontier markets' market capitalization is low compared to emerging markets. The table also shows the average monthly volume in frontier, emerging and developed markets. As illustrated, the monthly turnover in frontier markets is also relatively low.

Table 2-3: Monthly value traded and market capitalization in developed, emerging and frontier markets.

Index	Monthly average value traded	Market cap
MSCI World	2 135 487	37 244 294
MSCI Emerging Markets	359 404	4 008 928
MSCI Frontier Markets	2 722	89 490

MSCI World consist of developed markets only. Market capitalization by August 31st 2016. Average value traded from December 2011 until August 2016. All numbers reported in USD millions. Source: Bloomberg (2016b)

2.1.3 Criteria 3: Market accessability

The final criteria in MSCI's classification framework are related to market accessibility for foreign investors. It can be assumed that there exists a causal relationship between restrictions on foreign ownership and liquidity in these markets. As restrictions increase the indirect costs by entering these markets, the number of transactions are likely to be low.

2.2 Previous research on frontier markets

The practical implications of frontier markets have also been covered in recent research. Philips & Redding (2013, p. 11) show that a USD 100 million portfolios in the MSCI Emerging Markets Index will take approximately 0,2 days to liquidate, compared to more than 10 days for an equivalent portfolio in MSCI Frontier Markets Index. In addition, the bid-ask spread and negative price impact due to low volume will also increase the direct and indirect transaction costs. Consequently, large frontier markets portfolios can be costly to manage.

Berger et al. (2011, p. 240) and Phillips & Redding (2013, p. 11) therefore points out that sophisticated and long-term investors are best positioned to benefit from exposure towards frontier markets.

2.2.1 World market intergration and diversification benefits

Diversification benefits in frontier markets has attracted much attention in previous research (Bekaert & Urias, 1996). Krohne & Speidell (2007) shows that the correlation between frontier and developed markets has been relatively low. Furthermore, using stock return data from 1989 to 2009, Berger et al. (2011) shows that the correlation can be explained by low integration with world capital markets. Their analysis proves that emerging and developed markets exhibit increasing world market integration, while no such pattern has been observed in frontier markets. They find that stock returns in frontier markets seem to be influenced by country-specific risk. Consequently, exposure towards frontier markets has historically decreased overall volatility of a global portfolio. Berger et al. (2011) also show that, although the risk seems to be reduced, frontier market exposure maintains the expected return and therefore increases the risk adjusted-return of a global portfolio. For instance, they show that risk-adjusted return was higher using equal weights in the FTSE All-World excluding US index, MSCI Emerging markets index, S&P500 index and a self-constructed frontier markets index, rather than using value weights. Based on historical observations, exposure towards frontier markets has been beneficial for long-term investors.

2.2.2 Risk premiums in frontier markets

Griffith & Quisenberry (2010, p. 55) argue for relatively high risk premiums in frontier markets due to lack of liquidity, as well as their unique political and economic risks. Consequently, higher premiums should be reflected in lower valuations measures, such as P/E and P/B. Griffith & Quisenberry (2010, p. 56) argue further that lower valuations may not only be justified by the risk measures mentioned above, but also by local market participants that demands high returns to compensate for the country-specific risk they are exposed to. According to modern portfolio theory, which says that non-diversifiable risk should be compensated, expected returns in frontier markets are theoretically too high for the risk they reflect (Griffith & Quisenberry, 2010, p. 55). This is a strong argument for global investors to increase exposure towards frontier markets.

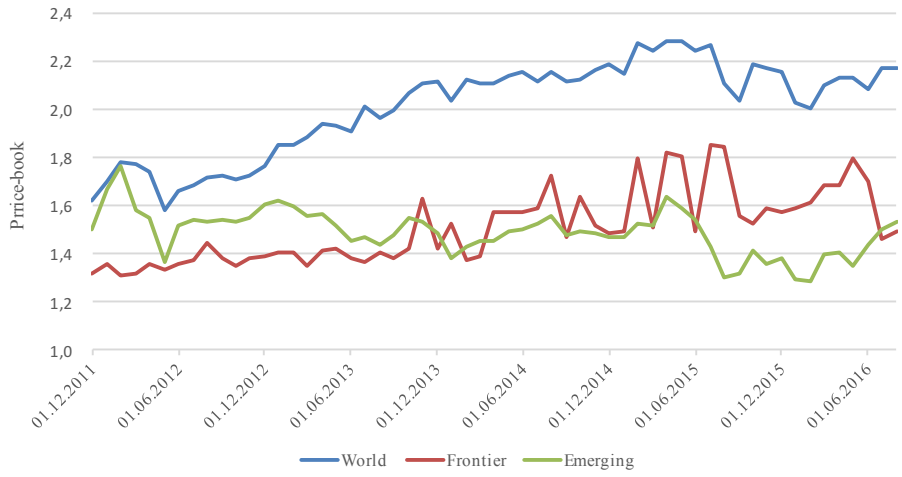
Table 2-4, and figure 2-3 and 2-4 illustrate historical P/E and P/B values for MSCI Frontier Markets, MSCI Emerging Markets and MSCI World indices. As expected, we observe that valuation measures are low compared to developed markets. However, valuation measures are relatively similar to observations in emerging markets.

Table 2-4: Average P/E and P/B for developed, emerging and frontier markets.

	Average P/E	Average P/B
MSCI World	18,03	2,02
MSCI Emerging Markets	12,98	1,49
MSCI Frontier Markets	11,38	1,52

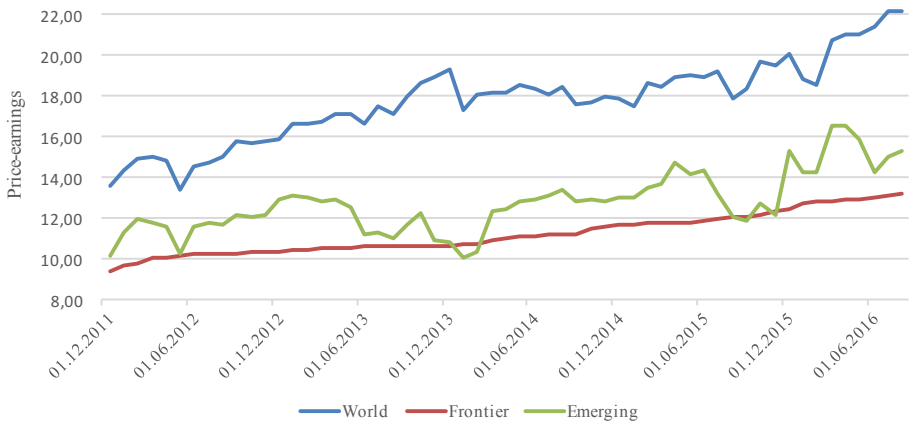
Calculated from August 2011 to August 2016. MSCI World consists of developed markets only. Source: Bloomberg (2016b)

Figure 2-3: P/B ratio in frontier, emerging and developed markets.



Source: Bloomberg (2016b)

Figure 2-4: P/E ratio in frontier, emerging and developed markets.



Source: Bloomberg (2016b)

3. Theory

Value effects are well documented in the literature. Research has also shown that small companies seems to outperform large companies. The latter is usually referred to as the size effect. These effects are central in the modern literature on portfolio management.

In this part, we explain the main theories behind these effects. We start by presenting the consumer-based view, which has laid the foundation for modern factor pricing theory. It is important to understand this approach to be able to understand why many academics and professionals focus on variables like P/B and size when investment decisions are made. In section 3.2, we present the Capital Asset Pricing Model (CAPM). This theory is further extended to include value and size in section 3.3. The fundamental drivers behind these effects are explained in section 3.4.

Unlike value and size investing, strategies which involve buying unpopular and under-analyzed stocks are less covered in the literature. However, we will present some of the most important and well known research on this field in section 3.5.

3.1 Factor pricing models: the traditional view

Factor pricing models try to explain the drivers behind stock returns. The traditional model assumes that investors marginal utility to consumption is increasing, but by a decreasing rate (Cochrane, 2005, p. 13). During bad times, when wealth is low, investors have a higher marginal propensity to consumption than in good times. As a consequence, investors drive up prices on stocks that perform well during bad times relative to stocks that perform bad. These dynamics lead to risk premiums, which compensates investors for bearing risk of losing money when wealth is low. Factors are variables which indicate when bad times occur, and a stock's exposure towards these factors decides the size of the premium. To understand this theory in more detail, we use theory outlined in Cochrane (2005, p. 5-33 & p. 149-184).

From time to time, investors are confronted with the dilemma between consumption today versus consumption in the future. An investor's utility function can be expressed as:

$$U(c_t, c_{t+1}) = u(c_t) + \beta E_t[c_t + 1] \quad (3\text{-}1)$$

where $u(c_t)$ and $E_t[u(c_{t+1})]$ denotes the utility of consumption at time t and the expected utility of consumption at time t+1. β is called the subjective discount factor and captures the investor's impatience. By maximizing the utility function, assuming there is a budget constraint, we get:

$$p_t = E_t\left[\beta \frac{u'(c_{t+1})}{u'(c_t)} x_{t+1}\right] \text{(3-2)}$$

where p_t is the price of an asset today and x_{t+1} is the payoff at time t. The payoff is the price at time t +1 plus the dividend. We then define a stochastic discount factor:

$$m_{t+1} = \beta \frac{u\prime(c_{t+1})}{u\prime(c_t)} \text{(3-3)}$$

Because, $u'(c_t)$ declines while c_t rises, m_{t+1} has to increase when c_t increases, meaning that the price co-varies positively with consumption. Buying assets that perform well when wealth is high and poor when wealth is low will make the investor's consumption more volatile. In line with what was mentioned above, investors need to be compensated for holding such risk.

By substituting (3-3) into (3-2), we get:

$$p_t = E_t[m_{t+1} * x_{t+1}] \text{(3-4)}$$

Dividing (3-4) on p_t gives us:

$$1 = E_t[m_{t+1} r_{t+1}] \text{(3-5)}$$

where r is the return: $\frac{x_{t+1}}{p_t}$

Because $p = E[m * x]$ implies that $E(r) = \alpha + \beta_{i,m}\lambda_m$, we can write:

$$1 = E\left(mr^i\right) = E(m)E\left(r^i\right) + cov(m, r^i) \text{(3-6)}$$

where the superscript i is added to reflect that each risky asset must be discounted by an asset-specific risk-adjusted discount factor.

We then get

$$E\left(r^i\right) = \frac{1}{E(m)} - \frac{cov(r^i,m)}{E(m)} \text{(3-7)}$$

$$\Leftrightarrow E\left(r^i\right) = \alpha + \left(\frac{cov(r^i,m)}{var(m)}\right)\left(-\frac{var(m)}{E(m)}\right) \text{(3-8)}$$

$$E(r^i) = \alpha + \beta_{i,m}\lambda_m \text{ (3-9)}$$

which says that the return of an asset, i, can be explained as its exposure, $\beta_{i,m}$, towards a risk premium λ_m.

While the consumption based model explains how risk premiums occur, it does not work very well in practice (Cochrane, 2000, p.149). Modern asset pricing theories therefore seek to tie the discount factor, m, to other variables. Linear factor pricing models have become the most popular approach to this problem.

Factor pricing models replace the consumption-based expression for marginal utility growth with a linear model, which can be expressed as:

$$m_{t+1} = a + b'f_{t+1} \text{ (3-10)}$$

where a and b are free parameters. In line with equation (3-9), this can be expressed as a multiple-beta model:

$$E(r_{t+1}) = \alpha + \beta'\lambda \text{ (3-11)}$$

where β are multiple regression coefficients of returns, r, on the factors f_{t+1} .

The problem is that we do not know what should be used as factors, f_{t+1}. Factor pricing models try to solve this problem by defining a set of observable variables which work well as proxies for aggregate marginal utility growth. This follows directly from equation (3-3) and (3-10):

$$\beta\left(\frac{u\prime(c_{t+1})}{u\prime(c_t)}\right) \approx a + b'f_{t+1} \text{ (3-12)}$$

3.2 Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM) is the oldest and most well-known asset pricing theory. It was developed by Treynor (1962), Sharpe (1964), Lintner (1965) and Mossin (1966). The theory assumes that there exist two drivers behind stock returns: systematic and non-systematic risk. While the systematic risk is the exposure, β, towards the market, non-systematic risk can be explained as firm-specific risk. The important difference is that non-systematic risk can be diversified away, while systematic risk cannot. As a consequence, investors are compensated for the willingness to bear this risk. In other words, the market return is applied as the factor, , f_{t+1}:

$$E(r^i) = r_f + \beta_i(E(r_M) - r_f) \quad (3\text{-}13)$$

3.3 Fama-French Three Factor Model

Whereas CAPM includes only the market return, Fama & French (1993) add two additional factors; value and size.

For decades, investment decisions based on certain price- and accounting-ratios have received a great deal of attention. In 1934, Dodd & Graham wrote:

> A given common stock is generally considered to be worth a certain number of times its current earnings. This number of times, or multiplier, depends partly on the prevailing psychology and partly on the nature and record of the enterprise. Prior to the 1927–1929 bull market ten times earnings was the accepted standard of measurement. (p. 536)

Since then, value strategies have become a well-known concept, and academics argue that buying stocks with low prices relative to earnings, dividends, book assets and other measures of value, outperform the market. For instance, Basu (1977), Jaffe, Keim, and Westerfield (1989), Chan, Hamao, & Lakonishok (1991), and Fama and French (1992) have shown that stocks with relatively low ratios between stock prices and earnings per share outperform the broad market in the long run. Furthermore, Rosenberg, Reid, and Lanstein (1984), Chan, Hamao & Lakonishok (1991) and Fama and French (1992) showed that stocks with relatively low ratios between stock prices and book values of equity also outperform the broad market. This gave rise to the value premium, and today investors usually refer to value and growth stock, separating between stocks that are priced low or high relative to earnings and book-values.

In 1992, Fama & French presented an important contribution to this field. Creating dynamic and self-financing portfolios by buying value stocks and selling growth stocks, they showed that investors were able to harvest a premium on average. The portfolio is dynamic because it implies constantly buying and selling stocks as prices and fundamentals change. Fama & French also created portfolios consisting of long small companies and short large companies,

after Banz (1981) and Reinganum (1981) had shown that small firms seemed to give higher returns than large firms. As a consequence, Fama & French (1993) extended CAPM by adding two factors in addition to the market factor. The famous three-factor model emerged:

$$E(r^i) = r_f + \beta_i(E(r_M) - r_f) + s_i E(SMB) + h_i(HML) \quad (3\text{-}14)$$

where SMB and HML zero-net investment factors created from long small companies and short large companies, and long companies with low book-to-price ratio and vice versa. s_i and h_i are an asset's exposure towards each factor. The return of these factor portfolios can further be expressed as:

$$R_{SMB} = R_S - R_B \quad (3\text{-}15) \text{ and } R_{HML} = R_H - R_L \quad (3\text{-}16)$$

Recent research on international data has shown that since mid 80s there has actually been no premium for small stocks. It is therefore uncertain whether the size premium exists. Ang (2014, p.229) argues that the effect that was discovered before mid 80s might be a result of data mining. Another explanation is that rational investors, acting on these findings, have bid up the prices on small stocks and thereby removed the effect (Ang, 2014, p.229).

3.4 Fundamental explanation behind value and size effects

While there seem to be a consensus among academics that factor premiums exist, at least for value companies, it is more unclear what the fundamental explanations behind the premiums are. However, the explanations can usually be separated into two camps: rational and behavioral. Among the comprehensive literature on this field, we will mention some of the most cited theories.

3.4.1 Rational explanations

Cochrane (1991, 1996) and Zhang (2005), argue that firms differ in how they respond to economic shocks. While growth firms are characterized by investments in human capital, value companies are heavily invested in tangible assets such as machines and factories. Consequently, they argue that growth companies easier can divest or shift their activities towards more productive areas. Value companies, on the other side, are heavily invested in

tangible assets which are hard to sell, thus experience relatively high adjustment costs during economic downturns. Cochrane (1991, 1996) and Zhang (2005) therefore argue that value is fundamentally riskier than growth companies.

One rational explanation behind the size premium is that small companies, measured by market value, are small simply because they are riskier. Pratt & Grabowski (2010, p. 276) argue that researchers are mixing the size effect with other risk effects. The risk is reflected in a cash flow that is discounted with a higher rate than for large companies (Pratt & Grabowski, 2010, p. 276). Consequently, the market capitalization has to be relatively low. Amihud & Mendelson (1986), Hu (1997), Chalmers & Kadlec (1998) and Datar, Naik, & Radcliff (1998), suggest that relatively low liquidity should be compensated with higher expected returns. If small companies are less liquid than large, the size premium may simply be a compensation for low liquidity (Rouwenhorst, 1999, p. 1459).

However, Chan & Ibbotson (2009) showed that, regardless of liquidity, size has a separate effect on returns, thus affects cost of capital. By first dividing the companies by liquidity, they showed that small and relatively illiquid companies still earned higher returns than their larger relatives. The results were similar to those of Abbot (2005). By adding a liquidity premium factor to the Fama-French three factor model, he showed that the size premium still existed when liquidity was controlled for.

3.4.2 Behavioural explanations

Among the behavioral explanations behind value premiums, the over-extrapolation theories stand out as the most cited (Ang, p. 233). This approach was introduced by Lakonishok et al. in 1994. They showed that market participants over-extrapolate past growth into the future. Reflecting excessive optimism, the market bids up the prices of these companies. When the companies, in the future, do not fulfill the markets expectations, the prices fall. Consequently, growth companies are relatively expensive because investors over-extrapolate their future growth prospects. Barberis & Huang (2001) suggest that the value premium can be explained by investors' loss aversion. Because investors suffer more from losses than corresponding gains, stocks with weak prior performance tend to perform poorly until they reach a low price-to-book ratio. The market views these stocks as risker and demand a higher premium to hold these stocks, even though they are not necessarily fundamentally riskier.

3.5 Analyst recommendations and consensus

The relationship between returns and analyst recommendations has been covered in previous research on developed markets. Based on observations from Nasdaq, NYSE and AMEX during the period from 1985 to 1998, Jegadeesh et al. (2004) tested whether there exists a relationship between recommendations and six-month returns. In the general population, they did not find any evidence that recommendation consensus levels affect returns when other predictive signals are controlled for. However, they showed that quarterly changes in recommendations are robust predictors of future returns. The findings were also confirmed by Boni & Womack in a study presented in 2006. Using observations from the same markets from 1996 to 2002, they found similar results.

In another study, Jegadeesh & Kim (2006) also found a positive relationship between revisions and monthly returns in all G7 countries except for Italy during the period from 1993 to 2002. This confirms the impact of analyst recommendations on short-term returns in developed markets.

As far as we know, no similar studies have been performed on frontier markets. However, the effects that have been observed in developed markets, were also found in emerging markets. This is interesting, as frontier markets share many similarities with emerging markets. In addition, Chan & Hameed (2006) argue that the quality of the information provided to investors in emerging markets is different to that in developed market. Taking this into consideration, we might expect results from emerging markets to be different from developed markets. Moshirian & Wu (2009) tested how recommendations and revisions affect returns in 13 emerging markets from 1996 to 2005. Unlike developed markets, they found a positive relationship between future returns and recommendation levels. These effects were also relatively long lived, lasting up to 2 years. They also found a strong effect between revisions and returns, but this effect was short-lived and the effect diminished after the second trading day.

Another interesting finding in these studies, is that buy and strong buy recommendations seem to be over-represented compared to sell and strong sell recommendations. As shown in figure 5-7, this is also the case for our sample.

4. Hypotheses

In this section, we will present the specific hypotheses this thesis aims to test. Based on theory, Skagen Funds' investment strategy and what we know about frontier markets, we have developed five hypotheses.

First and second hypothesis:

In accordance with theory, P/E and P/B have been strong predictors of future returns. Our first and second hypothesis is:

> H_1: There is a negative relationship between P/B and long-term returns, i.e. 1 to 5 years.

> H_2: There is a negative relationship between P/E and long-term returns, i.e. 1 to 5 years.

Third hypothesis:

Research has shown that small companies seem to outperform large companies. Our third hypothesis is:

> H_3: There is a negative relationship between index weight and long-term returns, i.e. 1 to 5 years.

Alternatively, we could have used market capitalization directly. The advantage by using index weight, is that we test for the relative size of a company in each particular month. Because the total market capitalization of the index will vary over time, we consider using index weight as a more robust method. We also believe that companies with relatively high free float market capitalizations attract more analyst attention, as more of the total market capitalization are available on the open market. This might strengthen our choice of using adjusted index weights instead of total market capitalizations, as it better reflects popularity. However, we emphasized that this is just an assumption, which is open for discussion.

Fourth hypothesis:

As mentioned, Skagen Funds seeks to invest in unpopular companies. Assuming that analyst consensus reflects the broad markets' view, we use this as a proxy for unpopular, i.e. that unpopular is that the average analyst consensus is negative. This approach can be backed by previous findings on this field. As we have seen, upward revisions and consensus levels affect earnings in the short run, i.e. 1 to 12 months. The effect is most apparent for revisions, but seems to be short-lived. Taking a long-term perspective into consideration, it might be a

rational strategy for contrarian investors to buy stocks with a weak consensus level. This strategy might seem counterintuitive, but because stocks with a positive consensus are most likely to maintain a positive consensus or be adjusted downwards in the long run, and because revisions seem to have the strongest effect on future returns, this strategy might lead to abnormal returns in the long run. Consequently, our fourth hypothesis is:

> H_4: There is a negative relationship between consensus and long-term returns, i.e. 1 to 5 years.

Fifth hypothesis:

Skagen Funds also seeks to overweight under-analyzed companies. We also believe that this strategy can be justified by previous research. As we have seen, there is a heavy overweight of strong buy and buy recommendations in developed and emerging markets. As figure 5-7 illustrates, this is also the case for frontier markets. Considering Skagen Funds' strategy and research suggesting that new analyst recommendations are most likely to be positive, our fifth hypothesis is:

> H_5: There is a negative relationship between analyst coverage and long-term returns, i.e. 1 to 5 years.

It is important to notice that by assuming that analyst opinions reflect the broad market, hypothesis 4 and 5 are highly connected in the sense that analyst coverage might also reflect popularity. If a specific company attracts much attention among investors, and thereby the banks' clients, it is natural to assume that more analyst will also cover this stock.

Each hypothesis has been tested against a corresponding null hypothesis that we do not find any relationship.

5. Data and methodology

In this section, we will present the data and methodology used in our analysis. The section is structured as follows; in section 5.1, we present the choice of data and potential biases. The second section provides the reader with descriptive data - explaining the data set, any missing observations and the actions we have taken to increase the number of observations. Finally, we present the methodology used to test our hypotheses. As we will see, using simple statistical techniques on overlapping returns leads to biased estimates and standard errors, which need to be adjusted for.

5.1 Sample selection

Currently, there are several providers of frontier markets indices, for instance S&P, FTSE and MSCI. We have chosen to use MSCI as they provide us with the longest time series and the best available data on independent variables from Bloomberg. MSCI performs quarterly index reviews where companies and countries are removed or added to the index. By collecting these, we have extracted a total of 334 companies included in the index during the period from August 2008 to August 2015[3]. Company data necessary to perform our analysis were retrieved from Bloomberg. Appendix C and D contains an overview of sample variables retrieved from the database and companies included in our analysis.

The choice of index provider might lead to potential biases:

5.1.1 Selection bias

Our choice of MSCI versus other frontier market indices potentially leads to selection bias, meaning that our sample does not properly represent the population. As we have seen, market classification is based on qualitative assessments in addition to the quantitative measures. As index providers use different frameworks, countries and stocks differ among indices.

The correlation matrix in Table 5-1 also shows that correlations between the indices are high. To put things in perspective, we also included the MSCI Emerging Markets Index. We argue

[3] The minimum holding period studied in this thesis is 1 year, thus index revisions after August 2015 are ignored.

that the high correlations indicate that the indices to some degree are overlapping. Hence, we expect that our results would be somewhat similar regardless of which index is chosen.

Table 5-1: Correlation matrix between different frontier market indices.

	MSCI Frontier Markets	MSCI Emerging Markets	FTSE Frontier Markets	S&P Frontier BMI
MSCI Frontier Markets	1			
MSCI Emerging Markets	0,58	1		
FTSE Frontier Markets	0,85	0,48	1	
S&P Frontier BMI	0,93	0,60	0,87	1

Correlation between MSCI, S&P and FTSE Frontier Markets Indices from June 2011 to August 2016. Source: Bloomberg (2016c)

Our impression is that MSCI has the strictest requirements for inclusion as it has the lowest number of constituents. As observed in table 5-2, MSCI Frontier Markets Index includes far less companies than its competitors. Because Skagen Funds and other institutional investors are likely to have minimum requirements for liquidity, size and other qualitative measures, we believe it makes sense to restrict our investment universe to the countries and companies included in the MSCI index.

***Table 5-2: Companies and countries included in the MSCI, S&P and FTSE Frontier* Markets Indices by August 31st 2016.**

Index	Companies	Countries
MSCI Frontier Markets	108	23
S&P Frontier BMI	500	34
FTSE Frontier Markets	328	27

Source: Bloomberg (2016a).

5.1.2 Look-ahead bias

When back-testing the performance of an investment strategy, one should only use information that were available at the time of the investment. Using information that are not available at time of the trade, would be like testing a non-implementable strategy.

In our case, all variables were obtainable at each point in time. The strategy can therefore be implemented in the future, such that no look-ahead bias occurs.

5.1.3 Survivorship bias

Survivorship bias is a more pronounced problem when using indices as the basis for construction of samples. This implies that one would only measure the effect on observations

that "survive" a process. In our case, this mean that we potentially use an empirical strategy that ignores a company after it leaves the index. For instance, negative returns or political instability in certain countries might force MSCI to degrade them to a standalone market. In the opposite situation countries might be upgraded to emerging markets.

We have chosen to include returns 1 to 5 years ahead independently of whether a company leaves the index during this period. For instance, if a company leaves the index in February 2011 we include returns up until January 2016, in the case of a 5 year holding period. By doing this, we ensure that we do not suffer from survivorship bias.

5.2 Descriptive data

Among the 334 companies included in the index, 11 were excluded as no observations were available. Consequently, our data sample consists of 323 companies included in the MSCI Frontier Markets Index during the period from august 2008 to august 2015. The observations are collected at the end of each month, and all numbers are in USD. Summary statistics of each variable are shown in table 5-3. Because the inclusion period and missing observations varies among companies, our data set is unbalanced.

Table 5-3: Summary statistics.

Variable	Mean	Median	Min	Max	Standard	Observations	Companies
P/E	21,43	11,32	0,53	8173,96	161,65	10577	279
P/B	2,38	1,57	0	55,9	3,87	11887	302
Index Weight	0,65	0,34	0,01	12,56	1	12993	323
Analyst coverage	4,92	3	0	24,8	5,22	12394	313
Consensus	3,67	3,86	1	5	1	8103	258
1 year forward return	3,11 %	-2,59 %	-89,55 %	715,15 %	40,64 %	12993	323
2 year forward return	10,91 %	-2,08 %	-97,89 %	1200,65 %	68,30 %	11350	310
3 year forward return	0,79 %	0,16 %	-86,12 %	86,38 %	20,52 %	9530	287
4 year forward return	1,55 %	1,54 %	-83,50 %	62,61 %	17,66 %	7763	268
5 year forward return	0,87 %	0,85 %	-82,15 %	52,25 %	16,17 %	5910	256

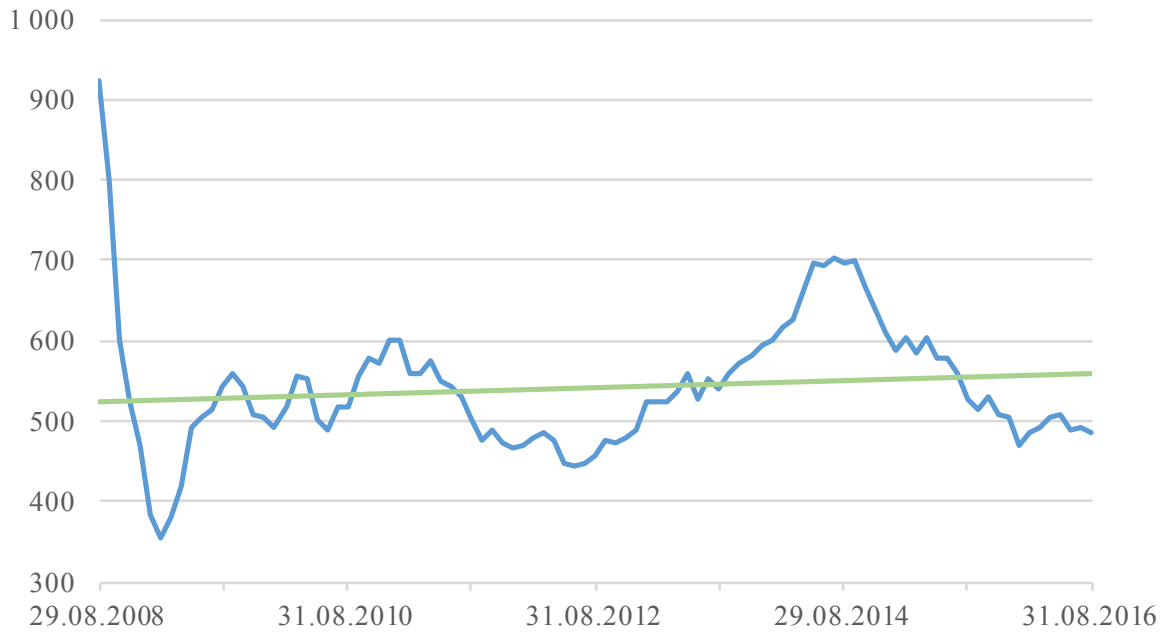
Our 1-year forward return implies that we will not use any of the independent variables after august 2015. The variables are therefore measured between august 2008 – august 2015. Returns are calculated in USD.

In the following, we will present our complete data set followed by an explanation of each variable.

5.2.1 Index returns

Figure 5-1 shows how the frontier markets index has developed during the sample period. As observed, frontier markets were heavily affected by the financial crisis in 2008. Even after the crisis the index has performed poorly. Over our sample period, MSCI Frontier Markets has experienced an annual return of -7,67 % with a yearly volatility of 19,64 %.

Figure 5-1: MSCI Frontier Markets return.



Index value from August 2008 to August 2016. Prices reported in USD. Bloomberg (2016c)

5.2.2 Index revisions

Our data set consists of 27 countries divided into 5 regions. During our sample period MSCI has conducted several reclassifications of companies and countries included in the index. Out of 162 companies in the index by August 2008, only 34 were still included by August 2016. Countries on the other hand are generally more stable. As observed from table 5-4, among the four countries that left the index, two were upgraded to emerging markets, while two were downgraded to standalone markets. Among the seven countries that have joined the index, four were upgraded from standalone markets, and three were downgraded from emerging markets.

Table 5-4: Reclassifications.

Country	Reclassification	When
Qatar	From frontier to emerging	May 2014
United Arab Emirates	From frontier to emerging	May 2014
Morocco	From emerging to frontier	November 2013
Trinidad & Tobago	From frontier to standalone	May 2011
Bangladesh	From standalone to frontier	May 2010
Argentina	From emerging to frontier	May 2009
Pakistan	From standalone to frontier	May 2009
Jordan	From emerging to frontier	November 2008
Lithuania	From standalone to frontier	November 2008
Serbia	From standalone to frontier	November 2008

List of country reclassifications related to MSCI Frontier Markets from August 2008 to August 2015. Source: MSCI (2016b)

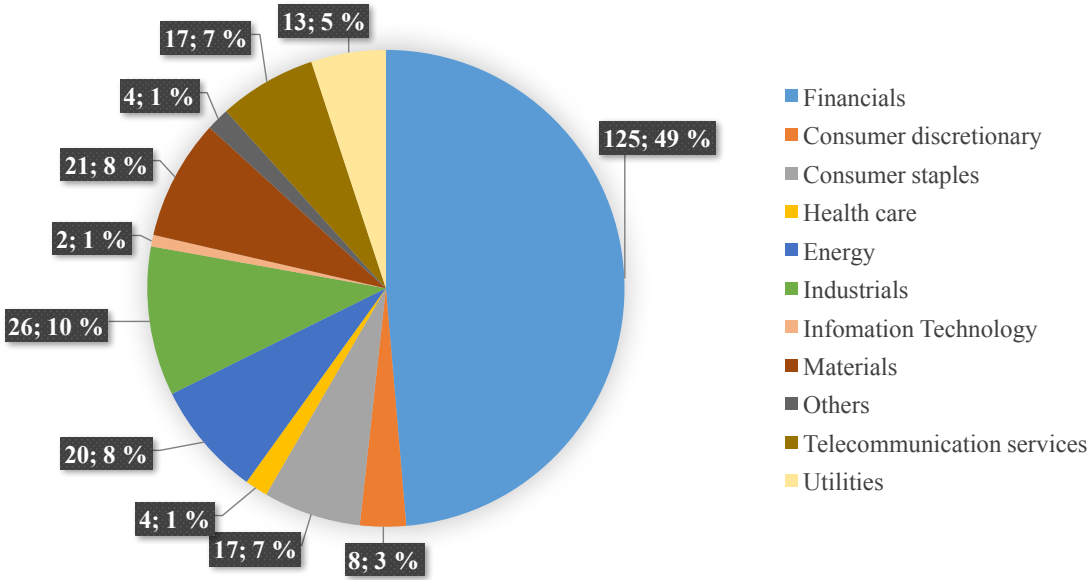
5.2.3 Sector distribution

To classify sectors, two different methods are frequently used by professionals: Industry Classification Benchmark (ICB) and Global Industry Classification Standard (GICS®)[4]. ICB was developed by FTSE and Dow Jones, while GICS® was developed by MSCI and Standard & Poors. As MSCI is also our index provider we chose to use the GICS®-classification for consistency. MSCI (2015) classified real estate as financials until August 2016, thus is classified as financials in our data set. According to MSCI's September 2016 update, real estate amounted to 6,18 % of the index' total market capitalization (MSCI, 2016c).

Figure 5-2 shows the sample's sector distribution. While all sectors provided by the GICS®-framework are represented, financials count almost 50% of the companies. Among sectors with 5 to 10 % representation, we find consumer staples, energy, industrials, materials, telecommunication services and utilities. Finally, among sectors with less than 5 % representation, we find health care, consumer discretionary and information technology. Only two companies are defined as information technology.

[4] For more information, see: http://www.icbenchmark.com/ and https://www.msci.com/gics

Figure 5-2 Sector distribution.

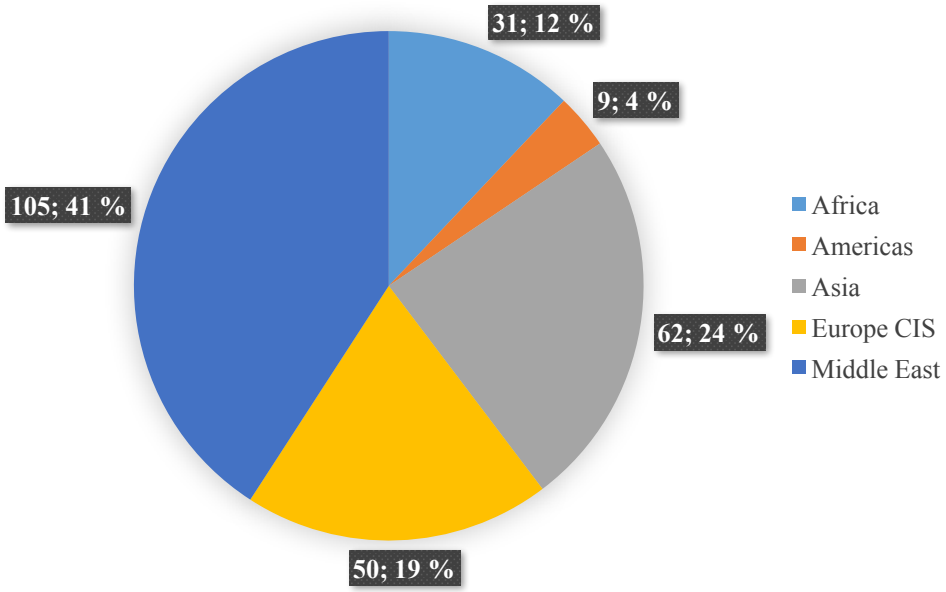


All companies included in MSCI Frontier Markets Index from August 2008 until August 2015 sorted by sectors.

5.2.4 Regional distribution

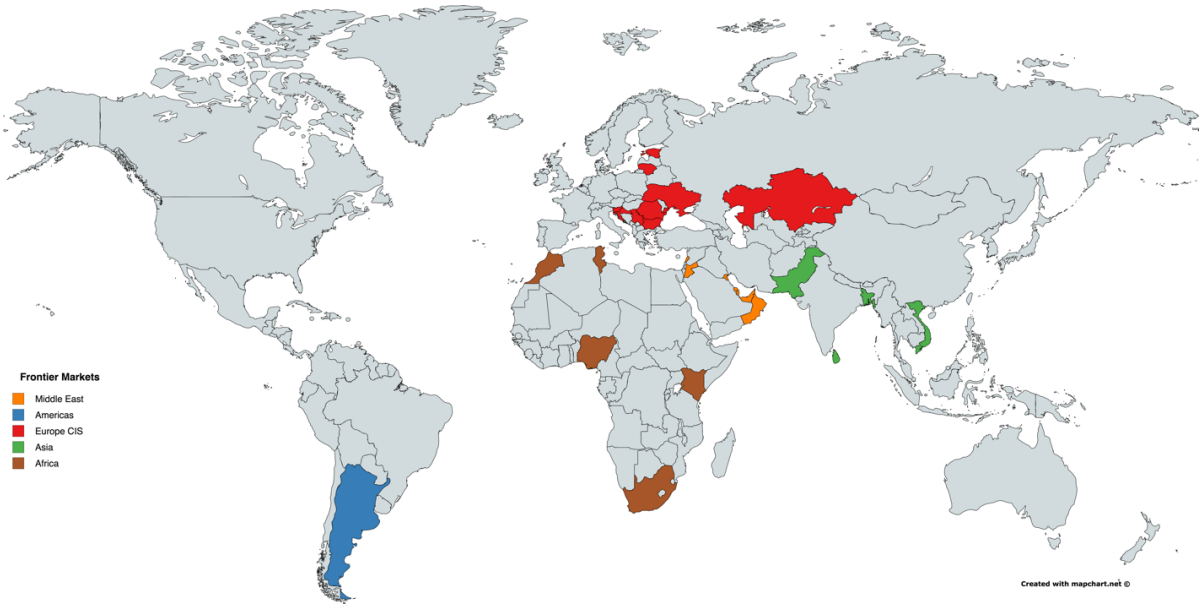
Figure 5-3 shows the sample's regional distribution. As observed, Middle East has the highest weight. Europe and Asia are also well represented, while Americas, which only consists of Argentina, counts only 4 % of our sample.

Figure 5-3 Regional distribution.



All companies included in MSCI Frontier Markets Index from August 2008 until August 2015 sorted by regions. Europe CIS means Europe and Commonwealth of Independent States, which includes former Soviet republics.

Figure 5-4 Countries in the data sample.



Regional distribution of companies included in the MSCI Frontier Markets Index from August 2008 to August 2015.

5.2.5 Variables

Price-earnings ratio:

P/E reflects the ratio between the stock price and the company's earnings per share. This is calculated as the last price divided by trailing twelve months' earnings per share:

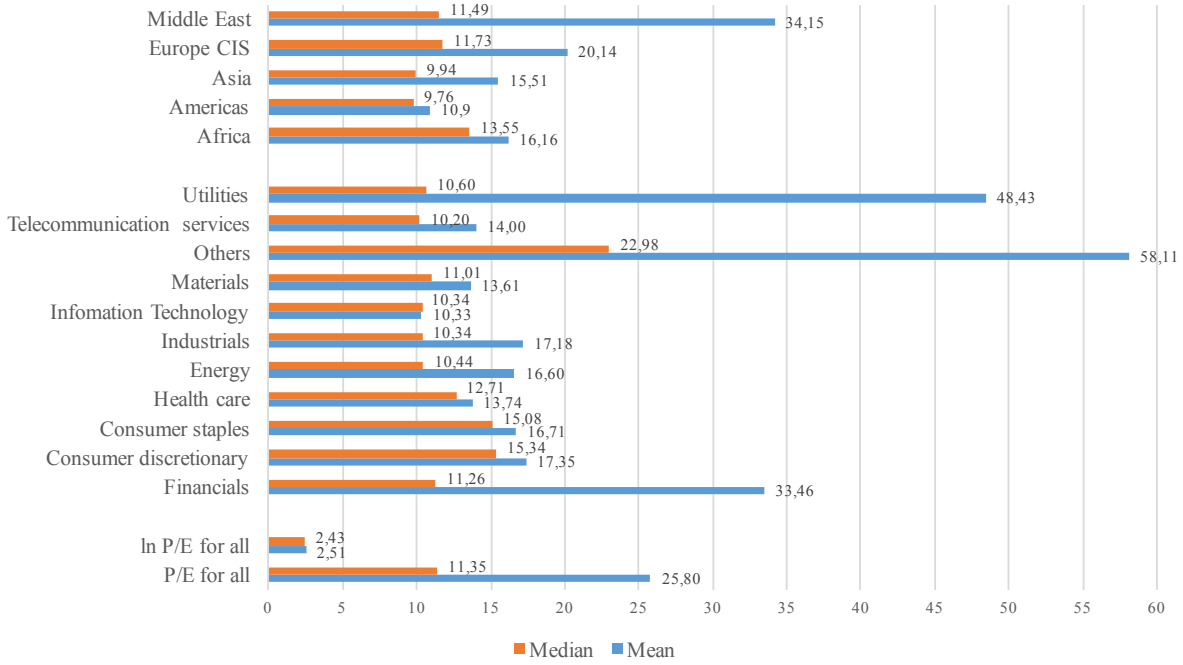
$$P/E_{it} = \frac{LP_{it}}{TTMEPS_{it}} \quad (5\text{-}1)$$

where LP_{it} is the last recorded price at time t for company i and $TTMEPS_{it}$ is the trailing twelve months earnings per share at time t for company i:

$$TTMEPS_{it} = \frac{TTM\ earnings_{it}}{shares\ outstanding_{it}} \quad (5\text{-}2)$$

P/E is retrieved directly from Bloomberg.

Figure 5-5 Average P/E.



Shows the mean and median P/E in our data sample, sorted by sectors and regions from August 2008 to August 2015.

Price-book ratio:

P/B is calculated as the ratio of the stock price to the book value per share using data from the most recent reporting period, which could be quarterly, semi-annual or annual reporting:

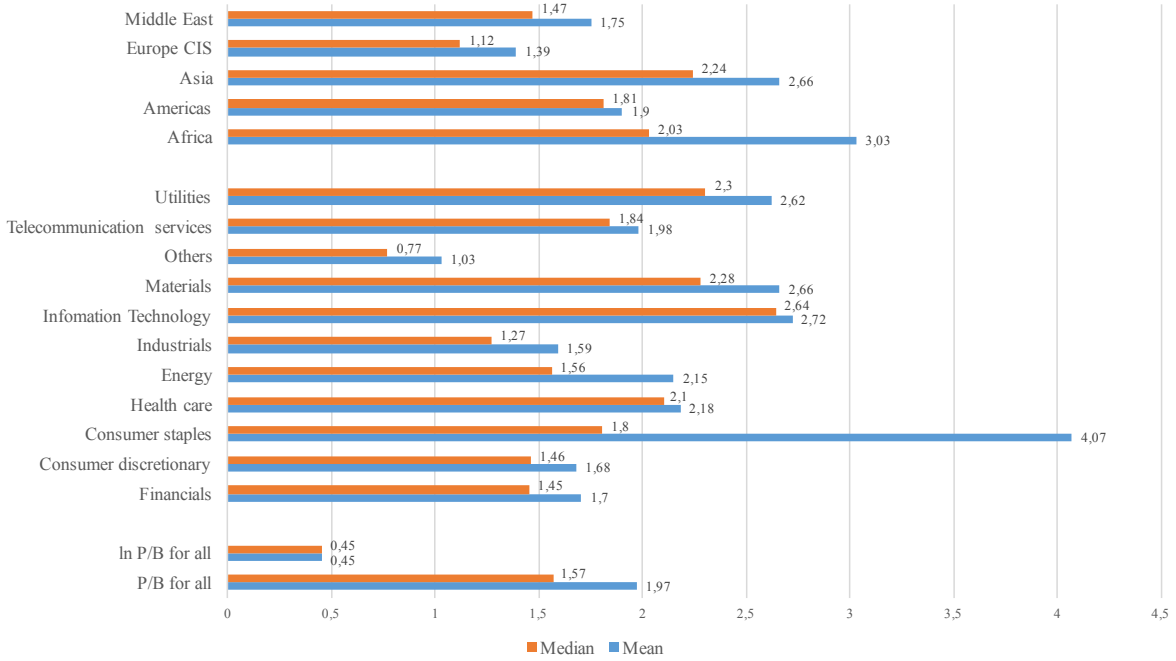
$$P/B_{it} = \frac{LP_{it}}{BVPS_{it}} \quad (5\text{-}3)$$

where $BVPS_t$ is equal to the book value per share at time t for company i:

$$BVPS_{it} = \frac{last\ reported\ book\ value_{it}}{shares\ outstanding_{it}} \quad (5\text{-}4)$$

P/B is retrieved directly from Bloomberg.

Figure 5-6: Average P/B.



Shows the mean and median P/B in our data sample, sorted by sectors and regions from August 2008 to August 2015.

The mean and median P/B is 1,97 and 1,57, respectively. Similar to P/E, a large deviation between mean and median values indicates that our data sample consists of some outliers.

Index weight:

As a proxy for size we have used each company's index weight at each particular point in time. The index weight does not have any official definition by Bloomberg, but has been extracted from MSCI Frontier Markets' quarterly holding reports. As this study use monthly observations, the quarterly holding reports will produce missing observations. To adjust for this, we extrapolated the missing observations by assuming that the these are equal to the average of the index weight in the month before and after, such that:

$$IW'_{it} = 0{,}5 * IW_{i,t-1} + 0{,}5 * IW_{i,t+1} \quad (5\text{-}5)$$

where IW'_{it} is the index weight in the case of a missing observation for company i at time t.

Recommendation consensus:

Analyst recommendations reflect the analysts' opinions on a particular security. Bloomberg categorizes the analyst recommendations on a scale from strong sell to strong buy. This is done by assigning each analysts' recommendation an integer between 1-5 where 1 is equal to

strong sell and 5 is equal to strong buy. Recommendation consensus (RC_{it}) is calculated as the average of all these recommendations:

$$RC_{it} = \frac{\sum_{n=1}^{N} R_{itn}}{N} \quad (5\text{-}6)$$

where R_{itn} is equal to the recommendation by analyst n at time t for company i, with a total number of analysts, N.

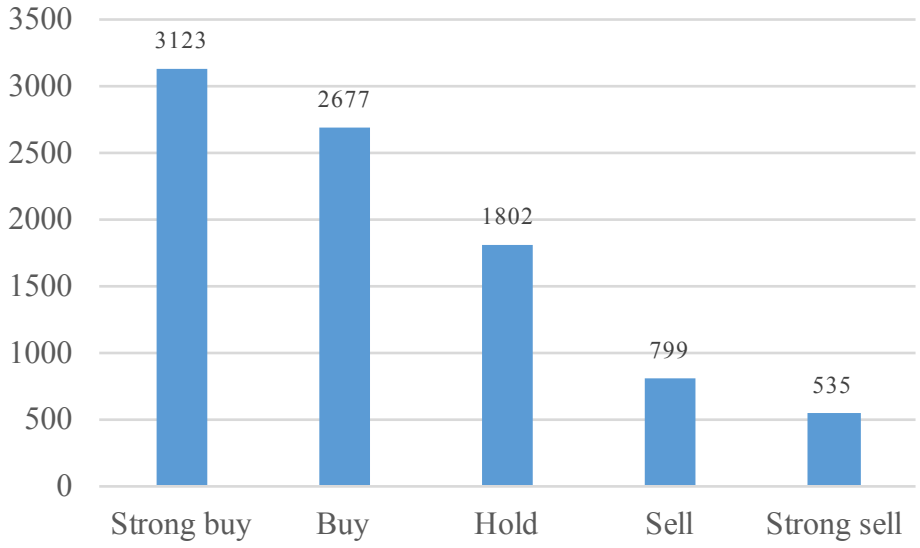
Based on these averages we have chosen to categorize recommendations into the ranges shown in table 5-5. These categorizations allow us to use analyst consensus dummies in our regression and test whether each category affect returns.

Table 5-5: Dummy categorization of analyst consensus.

Description	Range
Strong sell	1,0 - 1,8
Sell	1,8 - 2,6
Hold	2,6 - 3,4
Buy	3,4 - 4,2
Strong buy	4,2 - 5,0

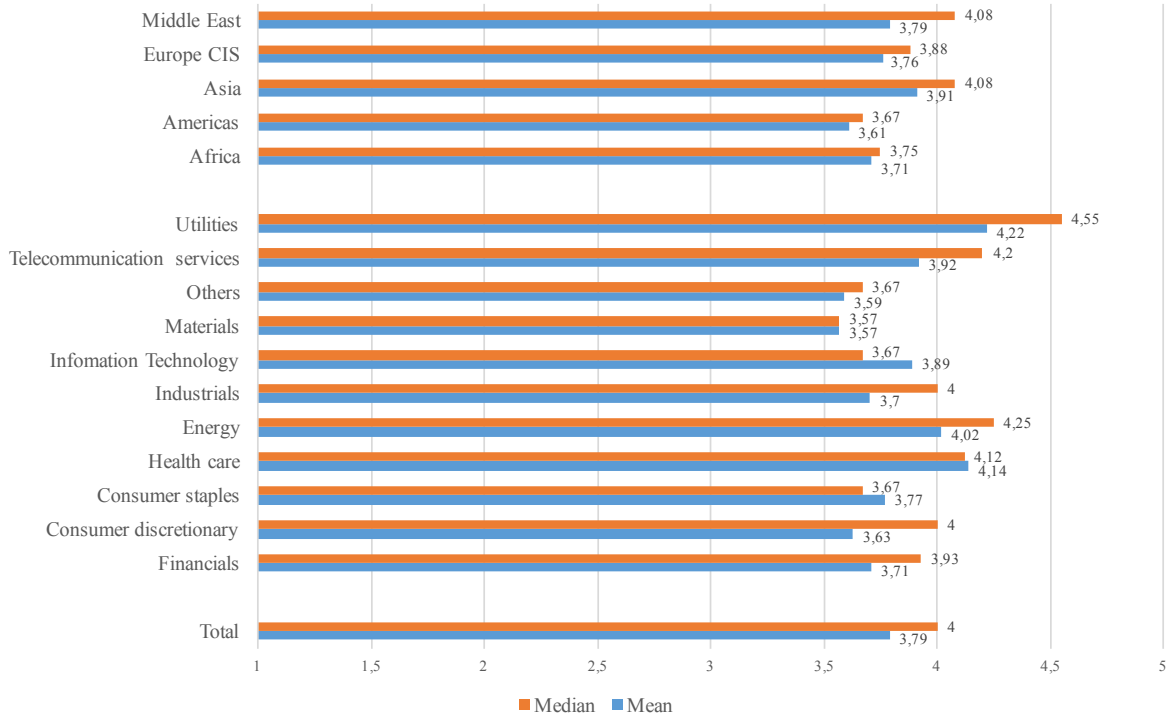
Categorization of analyst consensus into different dummy variables in our data sample.

Figure 5-7: Distribution of analyst recommendations.



Distribution of analyst recommendations in our data sample, from August 2008 to August 2015. Categorized as in table 5-5.

Figure 5-8: Average analyst consensus.



Mean and median analyst consensus in our data sample, sorted by sectors and regions from August 2008 to August 2015.

As observed in figure 5-7, analyst consensus is skewed towards "Buy". This is consistent with what observations in previous research on developed and emerging markets. There are relatively small deviations between different sectors and regions, but Americas seem to be rated lowest while Asia is rated highest.

Analyst coverage:

Analyst coverage is the total number of recommendations for each company. The data provided by Bloomberg have a few cases of missing observations. It could happen that a company would go from, for instance 10+ analysts to 0 from month 1 and 2, and back to 10+ in month 3. As this change seems unlikely, we chose to compute a rolling average of the 4 previous observations. We believe that treating those observations as zero is less valid than using a rolling average. A company covered by 10 analysts in a normal situation would be considered well above what's normal, and we would therefore rank it somewhat similar in the following months.

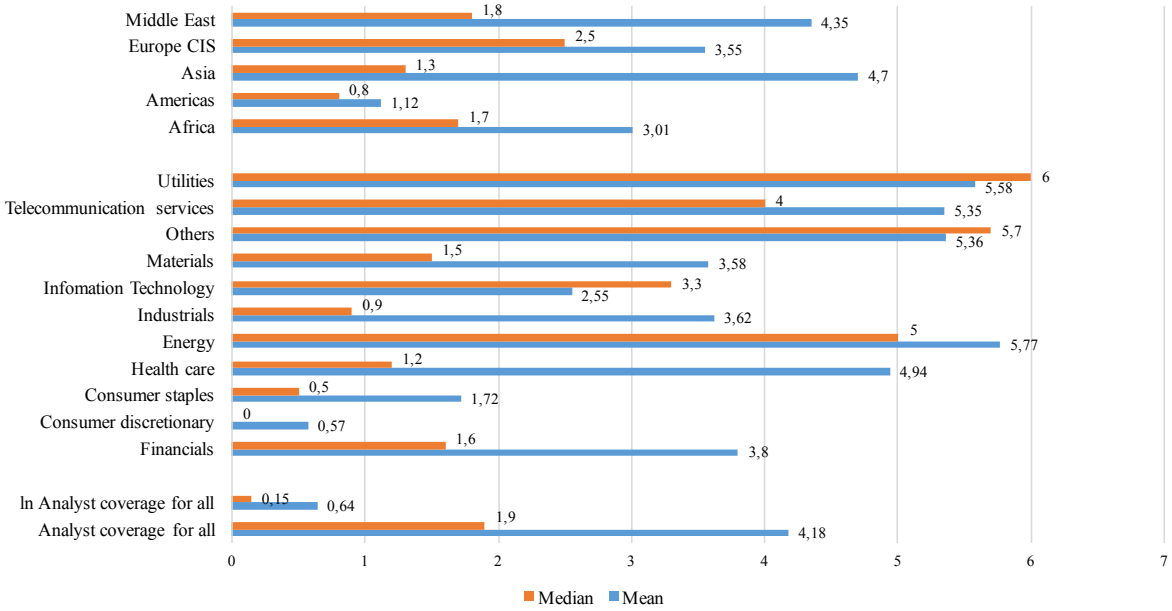
The rolling average is computed as follows:

$$A_{it} = 0{,}4A^i_{it} + 0{,}3A^i_{i,t-1} + 0{,}2A^i_{i,t-2} + 0{,}1A^i_{i,t-3} \quad (5\text{-}7)$$

where A_{it} = Analysts at time t for company i.

As observed, we put a high weight to the latest observations, as we assume that more recent observations are most representative for today's situation.

Figure 5-9: Average analyst coverage.

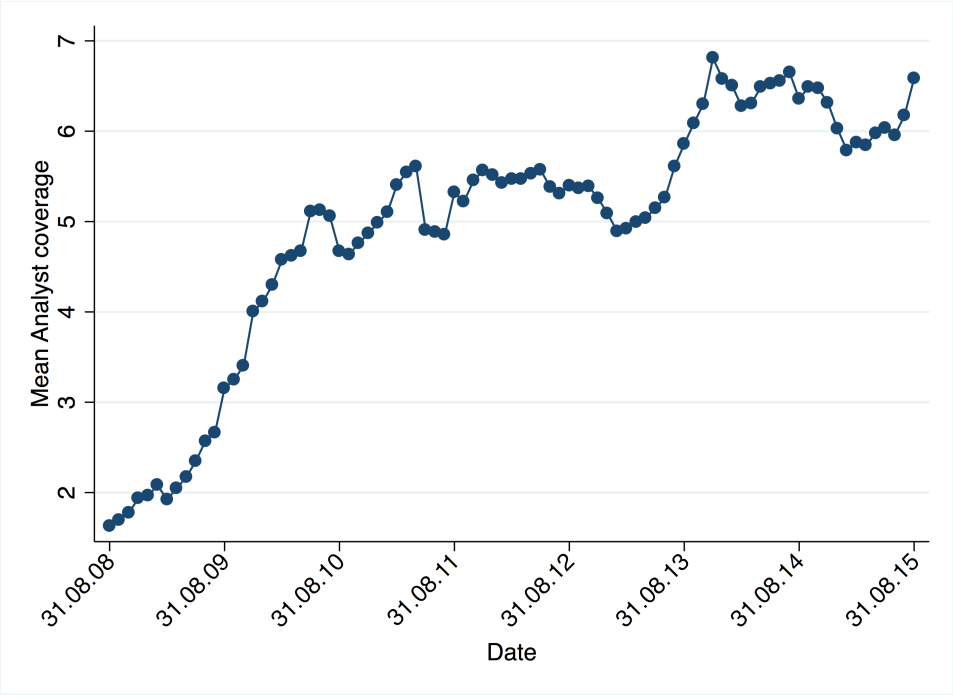


Shows the mean and median analyst coverage in our data sample, sorted by sectors and regions from August 2008 to August 2015.

On average we find 4,18 analysts covering each company. Compared to consensus, analyst coverage seems to have larger deviations among sectors and regions.

In figure 5-10, we see that the average number of analysts covering each company has increased significantly during our sample period. While the average number of analysts were close to 2 in August 2008, the number of analysts was close to 7 by the end of August 2015.

Figure 5-10: Average number of analysts per company.



The figure shows the average number of analysts from August 2008 until August 2015 for all companies included in our analysis.

Adjusted prices and forward returns

To calculate the total return of a stock, including both capital gains and dividends, we have used the same methodology as Yahoo Finance (2016). We started by calculate the adjusted close price in two steps:

First, we calculate a dividend multiplier for each firm i at each particular month t, DM_{it}:

$$DM_{it} = 1 - \frac{D_{i,t+1}}{P_{it}} \quad (5\text{-}8)$$

where $D_{i,t+1}$ is the distributed dividend on time t+1 for firm i, and P_{it} is the closing price at time t for firm i.

Secondly, the adjusted close price, AP_{it}, is calculated as:

$$AP_{it} = Close\ price_{it} * DM_{it} \quad (5\text{-}9)$$

When calculating returns it is important to note that each years' return is not independent of the previous return. For that reason, we based our formula for forward return, r_{it}^{z}, on the formula for geometric average:

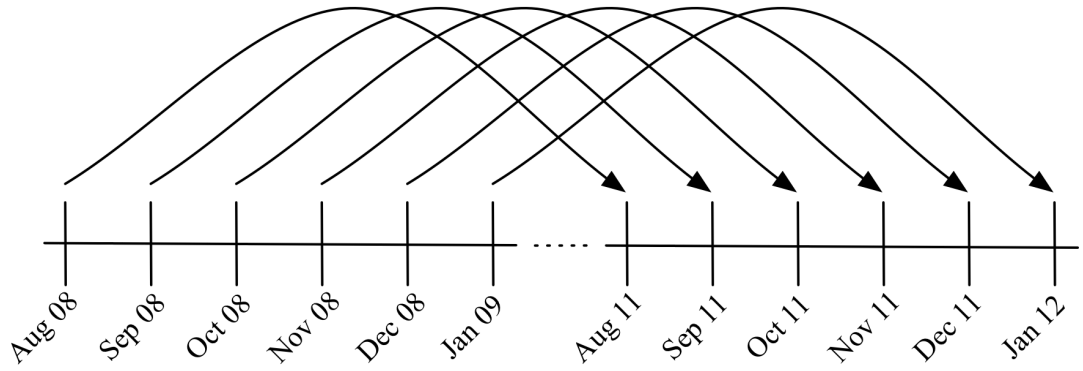
$$r_{it}^{z} = \left(\frac{AP_{i,t+(z*12)} - AP_{it}}{AP_{it}}\right)^{\frac{1}{z}} - 1 \quad (5\text{-}10)$$

where z is the holding period in years.

5.3 Choice of methodology

As the Fama-French three factor model use dynamic long-short portfolios, using these portfolios in practice will require a lot of trading and constant rebalancing. Because transactions costs in frontier markets are generally high, a simple long-term buy and hold strategy is more relevant for large investors. Rather than constantly measuring the relationship between short term returns and P/E, P/B, size, analyst recommendations and consensus, we have chosen to test for holding periods ranging from 1 to 5 years. More precisely, we will measure whether there exists a relationship between our explanatory variables by the end of each particular month and returns 1 to 5 years ahead. The strategy is illustrated in figure 5-11.

Figure 5-11: Empirical strategy



The figure illustrates our strategy in a case of 3 year holding periods. To test the predictable power of the independent variables we will measure the relationship between the observations for our independent variables and future returns by the end of each month throughout our data sample. In this way, we will be able to test whether observable values, such as P/E, affect future returns. As explained in the figure this means that we will look at simple observations of our independent variables with future returns as the dependent variable. This figure shows an example with t+36 future returns where for instance price-earnings in August 2008 will potentially explain returns from time August 2008 to August 2011.

The challenges in choice of methodology for this study mainly consist of three aspects:

1. Because our data sample covers a relatively short time period, we are forced to use overlapping returns. Because the observations on returns will be relatively similar from

one month to the next, overlapping returns create standard errors that are correlated over time. This effect, called serial-correlation, will increase when using longer holding periods. As we will see, this violates with one of the assumptions behind ordinary least square (OLS), thus creates downward biased standard errors. Consequently, we increase the risk for type I error, implying that we incorrectly reject the null hypothesis.

2. Previous research also argues that there are reasons to believe that residuals of given years are correlated across different firms (Petersen, 2009, p. 436). This effect, called cross-sectional dependence, leads to downward biased standard errors (Petersen, 2009). Similar to serial-correlation, this increases the risk for type I error.

3. It is natural to believe that stocks in certain companies, sectors or countries are relatively low priced due country risk or sector specific characteristics which affects book values, expectations about future returns etc. These effects, usually referred to as fixed effects, are common in panel data and need to be controlled for. By not controlling for these effects, we might get biased results.

To adjust for the potential biases from point 1 and 2, Petersen (2009) and Thompson (2011) suggest double clustering the standard errors by firm and time. Their approach is based on pooled OLS, which does not take fixed effects into account. To simultaneously control for fixed effects, cross sectional dependence *and* serial correlation, we have chosen to use dummy variable regressions and double cluster the standard errors. According to the research by Petersen and Thompson, this will give us the most accurate estimation of coefficient slopes and standard errors. In appendix B we have included an overview of alternative approaches and their effect on estimators and standard errors.

In the following, we present our methodology. In a step by step approach, we start by presenting OLS on time-series data, including the assumptions behind this method, and how violations can be avoided. As we use panel data, consisting of observations on several firms over time, we will extend this approach taking into account potential biases that might occur when analyzing several companies over time. Finally, we present the theory behind double clustering of standard errors, as presented in Thompson (2011).

5.4 Assumptions behind ordinary least squares (OLS)

In general, six different assumptions must hold to get valid confidence intervals and the best linear and unbiased estimators conditional on our independent variables. In time-series analysis, these can be formulated as (Wooldridge, 2014, p. 279-285):

1. Linear in parameters:
   The stochastic process $\{(x_{t1}, x_{t2}, \dots, x_{tk}, y_t)\colon \mathrm{t} = 1,2, \dots, \mathrm{n}\}$ follows a linear model:
   $$y_t = \alpha + \beta_1 x_{t1} + \cdots + \beta_k x_{tk} + u_t$$
   where α and β_1, β_2, …, β_k are unknown constant parameters of interest and $u_t\colon t = 1,2, \dots, n)$ is the sequence of errors or disturbances. n is the number of observations.
2. Collinearity:
   In the sample and the underlying times series process, none of the independent variables should be constant and there should not exist any perfect or close to perfect linear relationship between them.
3. Zero conditional mean:
   For each t, the error term, u_t, should have an expected value of zero given any values of the independent variables:
   $$E(u_t|X) = 0, t = 1,2, \dots, n$$
4. Homoscedasticity:
   Conditional on X, the error term, u_t, should have the same variance for all t: $Var(u_t|\mathrm{X}) = Var(u_t) = \sigma^2, t = 1,2, \dots, n$
5. No serial correlation:
   Conditional on X, the errors in two different time periods are uncorrelated: $Corr(u_t, u_s|\mathrm{X}) = 0$ for all $\mathrm{t} \neq s$
6. Normality:
   The errors u_t are independent on X, and are independently and identically distributed as Normal $(0, \sigma^2)$.

Following these assumptions, we have five important theorems (Wooldridge, 2014, p. 279-285):

1. Unbiasedness of OLS:
   Under assumption 1 to 3, the OLS estimators are unbiased conditional on X, thus are unconditionally as well: $E(\hat{\beta}_j) = \beta_j, j = 0,1, \dots, k$

2. OLS sampling variances:

   Under the assumption 1 to 5, the variance $\hat{\beta}_j$, conditional on X, is:

   $$Var(\hat{\beta}_J|\mathrm{X}) = \frac{\sigma^2}{\left[SST_j(1-R_j^2)\right]}, j = 1, \dots, k$$

   where SST_j is the total sum of squares of x_{tj}

3. Unbiased estimator of σ^2

   Under assumption 1 to 5, the estimator of $\hat{\sigma}^2 = \frac{SSR}{df}$ is an unbiased estimator of σ^2, where $df = n - k - 1$.

4. Under assumption 1 to 5, the OLS estimators are the best linear and unbiased estimators (BLUE) conditional on X.
5. Under assumption 1 to 6, the OLS estimators are normally distributed, conditional on X. Under the null hypothesis, each t-statistic has a t-distribution, and each F-statistic has an F-distribution. The construction of confidence intervals is also valid.

Using simple OLS on our data set leads to several violations of the assumptions above. In the following sections, we will present the main issues and how these are corrected for. Finally, we will sum up by arguing how our methodology produces the best linear and unbiased estimates conditional on our independent variables.

5.5 Adjusting for fixed effects in panel data

Panel data differs from time-series data as two or more objects are followed across time. A general panel data regression can be expressed as:

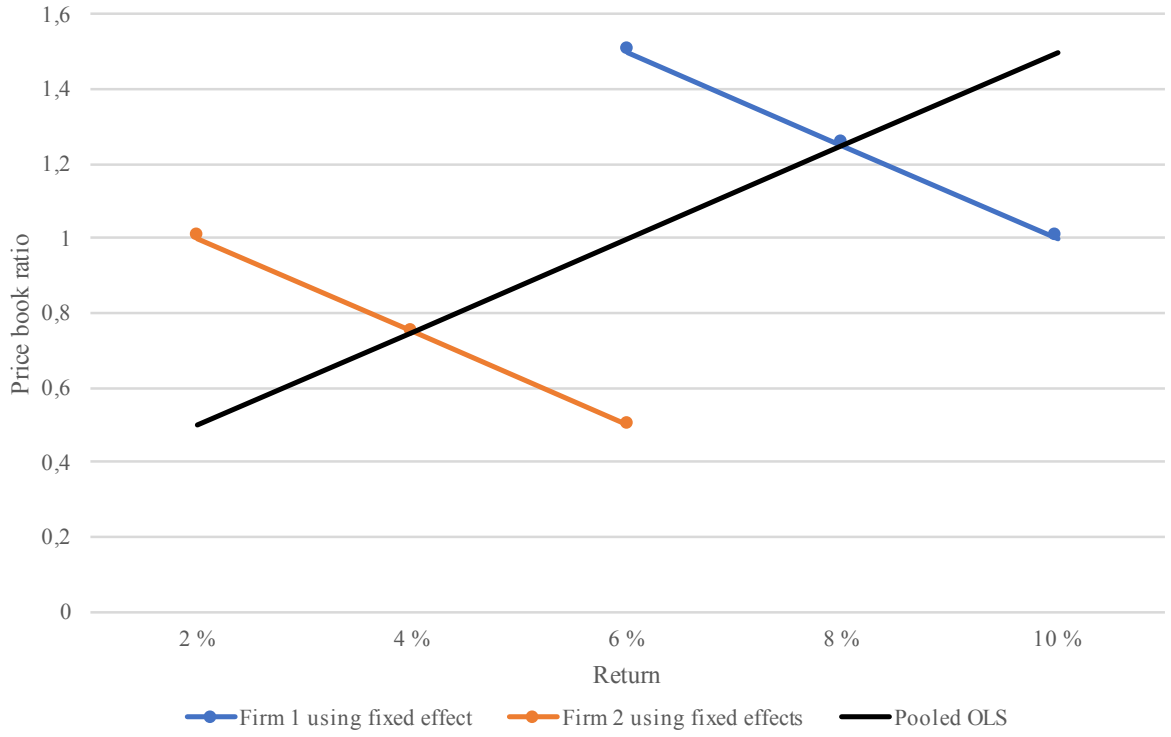
$$y_{it} = \alpha + \beta_1 x_{it1} + \cdots + \beta_k x_{itk} + v_{it} \quad (5\text{-}11)$$

Where $v_{it} = a_i + u_{it}$, i denotes the *i*'th firm, t denotes the time. a_i is a firm-specific unobserved fixed effect and u_{it} is the idiosyncratic, or time-varying error, representing unobserved factors that change over time an affect y_{it} (Wooldridge, 2014, p. 372). From assumption 6, we know that v_{it} should be uncorrelated with x_{it} for OLS to estimate consistent estimators, β_k (Wooldridge, 2014, p. 372). This means that pooled OLS is biased and inconsistent when a_i and x_{it} is correlated, even when we assume that x_{it} and u_{it} are uncorrelated (Wooldridge, 2014, p. 372).

In our case, it can be assumed that there exist firm-specific effects. For instance, some companies might be priced at a constantly lower P/B ratio reflecting firm-, sector- and country-specific risk. By ignoring this, we might get biased estimators.

This is illustrated in figure 5-12. Assume that we have observations over time for two separate firms, and that these observations are negatively correlated with returns. In such a case, regressions on each firm separately would lead to downward sloping trend lines, illustrated as the orange and blue lines in the diagram. We then find a negative relationship, which makes sense. On the other side, if all observations were pooled, we would get a positive and biased trend line, and the opposite conclusion.

Figure 5-12 Fixed effects.



Illustrates how fixed effects might lead to a biased estimate when using pooled OLS on panel data. Trend would be estimated as positive if not correcting for fixed effects.

The advantage with panel data, is that we can allow for constant unobserved effects, a_i. To show this, we consider a two-period model with object *i*:

$$y_{i2} = (\beta_0 + \alpha) + \beta_1 x_{i2} + a_i + u_{i2} \quad (5\text{-}12)$$

$$y_{i1} = \beta_0 + \beta_1 x_{i1} + a_i + u_{it} \quad (5\text{-}13)$$

By subtracting 5-13 from 5-12, we get rid of the unobserved effect, a_i:

$$(y_{i2} - y_{i1}) = \alpha + \beta_1(x_{i2} - x_{i1}) + (u_{i2} - u_{i1}) \text{ (5-14)}$$

$$\Delta y_i = \alpha + \beta_1 \Delta x_i + \Delta u_i \text{ (5-15)}$$

This method, called first-differencing, can also be applied to more periods. If for instance, T=3, we can subtract time period 2 from time period 3, and time period 1 from time period 2. To adjust for secular changes that are not being modelled, Wooldridge (2014, p. 381) recommends using time period dummies, d_t, when T is small relative to N. By including time dummies and differencing over 3 periods, we get:

$$\Delta y_{it} = \alpha_2 \Delta d_{t=2} + \alpha_3 \Delta d_{t=3} + \beta_1 \Delta x_{it1} + \cdots + \beta_k \Delta x_{itk} + \Delta u_{it} \text{ (5-16)}$$

for t= 2 and 3. Because there is nothing to extract from the t=1 equation, there is no differenced equation for this period.

Notice that equation (5-16) contains differences in differences in the year dummies, $d_{t=2}$ and $d_{t=3}$. For *t=2*, $\Delta d_{t=2}$ is equal to 1 and $\Delta d_{t=3}$ is equal to 0. For t=3, $\Delta d_{t=2}$ is equal to -1 and $\Delta d_{t=3}$ is equal to 1. Consequently, this model does not contain an intercept[5].

With more periods, things are similar:

$$\Delta y_{it} = \alpha_2 d_{t=2} + \alpha_3 d_{t=3} + \cdots + \alpha_T d_{t=T} + \beta_1 \Delta x_{it1} + \cdots + \beta_k \Delta x_{itk} + \Delta u_{it} \text{ (5-17)}$$

where we have T-1 time periods on each unit of the differenced equation.

5.6 Least squares dummy variable regression

While most research on panel data are performed using time-demeaned data, such as the fixed effects approach, another method that is easier implementable in combination with double clustering is to use dummy variables for each firm, i, and time, t (Wooldridge, 2014, p. 391). This allows for different firms and different points in time to have their own specified intercept. This method can be expressed as:

[5] This can, however, be included through a simple procedure, but this in irrelevant in our case. For more information, see Wooldridge (2014, p. 381).

$$y_{it} = \alpha_0 + \alpha_1 d_{t=1} + \cdots + \alpha_T d_{t=T} + \delta_1 d_{i=1} + \cdots + \delta_i d_{i=I} + \beta_1 x_{it1} + \cdots + \beta_k x_{itk} + u_{it} \quad (5\text{-}18)$$

where I is the total number of firms in our data set and T is total time periods.

This approach is usually referred to as least-square dummy variable regressions. It gives us the exact same estimates for β_j as regressions on time-demeaned data such as the fixed effects regression (Wooldridge, 2014, p. 391), but the explanatory power, R^2, becomes higher as much of the variation in long-term returns can obviously be explained by the time and firm dummies.

Fortunately, the explanatory power for each separate independent variable can still be calculated. By first finding the R^2 when all variables are included, and then finding the R^2 when only time and company dummies are included, we use the difference between the R^2's in these regressions to find the explanatory power of the non-binary variables separately.

5.7 Double clustering of standard errors

So far we have explained how to find the estimated coefficient and the explanatory power for each separate variable. However, as mentioned before, we already know that by using overlapping returns, we impose a high degree of serial correlation in our data sample, which violates with assumption 5. According to theorem 3, this might lead to biased standard errors. Obtaining unbiased standard errors are important in concluding whether or not to reject the null hypothesis that our estimators are equal to zero. Violations of these assumptions should therefore be treated seriously.

According to research conducted by Petersen (2009) estimation of standard errors in finance panel data varies widely in recent studies and are often incorrect. Petersen compares various approaches to estimating standard errors and shows that as much as 42 % of recent studies did not adjust standard errors for dependence in residuals.

Petersen (2009) argues that there are two common forms of dependence in panel data which will potentially lead to downward biased standard errors. This can be serial correlation, which is dependence over time in a particular firm, or dependence across the different firms in a particular point in time, so-called cross-sectional dependence. Petersen himself refers to these effects as "firm effects" and "time effects", respectively. According to his research the best

method to estimate standard errors in data sets with only a firm effect is to cluster standard errors by firm. For data sets with only time effects, the best method is to use Fama-MacBeth standard errors.

As we use factors dependent on stock data we have good reason to believe that there will be time effects in our data set (Petersen, 2009). Even though the regular OLS standard errors are biased, the OLS estimator is not necessarily unbiased as long as assumption 1 to 3 are not violated. With both time and firm effects, Petersen argue that to obtain unbiased standard errors one should cluster by two dimensions, e.g. by firm and time. By doing so, we capture both time and firm effects, but we assume that observations on different firms at different points in time are uncorrelated. See figure 5-13 for further explanations.

The procedure is described in Thompson (2009)[6]. According to his article, the estimated variance of the OLS estimator can be expressed as:

$$\widehat{Var_{2c}}(\hat{\beta}) = \widehat{Var}_{firm} + \widehat{Var}_{time,0} - \widehat{Var}_{white,0} \quad (5\text{-}19)$$

where $\widehat{\mathrm{Var}}_{\mathrm{firm}}$ is the regular estimated variance clustered by firm. This calculated as:

$$\widehat{Var}_{firm} = H^{-1} \sum_i \hat{c}_i \hat{c}_i' H^{-1} \quad (5\text{-}20)$$

where

$$H = \sum_{i,t} x_{it}\, x_{it}' \quad (5\text{-}21)$$

and

$$\hat{c}_i = \sum_t \hat{u}_{it} \quad (5\text{-}22)$$

$\hat{u}_{it} = \mathbf{x}_{it}\hat{\varepsilon}_{it}$ and $\hat{\varepsilon}_{\mathrm{it}}$ is the residual $y_{it} - \mathbf{x}_{it}'\hat{\beta}$, where $\mathbf{x}_{it}$ is the covariate vector.

$\widehat{Var}_{time,0}$ is calculated the exact same way as $\widehat{Var}_{firm,0}$, but clustered by time and not firm.

[6] The methodology in this thesis is presented in Thompson (2009). The stata codes that are used have been developed by Mitchell A. Petersen, and modified to adjust for fixed effects. The original codes are available at: http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm

$\widehat{Var}_{white,0}$ is the usual heteroscedasticity robust OLS variance matrix, calculated as:

$$\widehat{Var}_{white,0} = H^{-1} \sum_t \sum_i \hat{u}_{it} \hat{u}'_{it} H^{-1} \quad (5\text{-}23) \text{ (White, 1980)}$$

Double clustering by firm and time is also robust to heteroscedasticity (Petersen, 2009, p. 438). As mentioned in section 5.4, assuming homoscedasticity is one of the assumptions behind OLS.

Figure 5-13 illustrates the modified covariance matrix of the residuals. The green fields show the squared residuals known from regular OLS. As we adjust for correlation between residuals we add the blue and orange fields as well. The blue fields allow residuals of the same firm in different months to be non-zero, i.e. the time effect. In addition, the orange fields allow for different firms in the same month to be non-zero, i.e. the firm effect.

Figure 5-13: Double clustered covariance matrix.

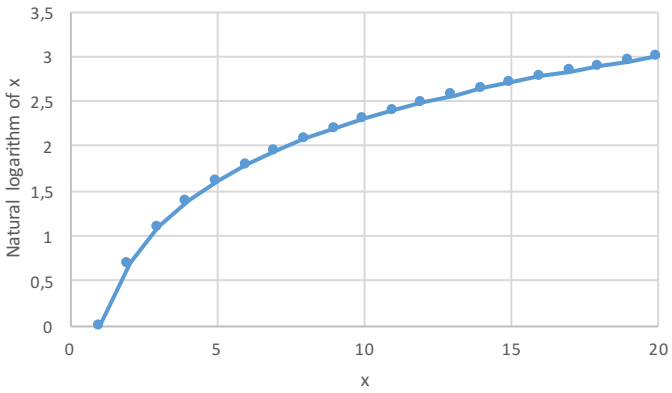
	Firm 1			Firm 2			Firm 3		
Firm 1	ε_{11}^2	$\varepsilon_{11}\varepsilon_{12}$	$\varepsilon_{11}\varepsilon_{13}$	$\varepsilon_{11}\varepsilon_{21}$	0	0	$\varepsilon_{11}\varepsilon_{31}$	0	0
	$\varepsilon_{12}\varepsilon_{11}$	ε_{12}^2	$\varepsilon_{12}\varepsilon_{13}$	0	$\varepsilon_{12}\varepsilon_{22}$	0	0	$\varepsilon_{12}\varepsilon_{32}$	0
	$\varepsilon_{13}\varepsilon_{11}$	$\varepsilon_{13}\varepsilon_{12}$	ε_{13}^2	0	0	$\varepsilon_{13}\varepsilon_{23}$	0	0	$\varepsilon_{13}\varepsilon_{33}$
Firm 2	$\varepsilon_{21}\varepsilon_{11}$	0	0	ε_{21}^2	$\varepsilon_{21}\varepsilon_{22}$	$\varepsilon_{21}\varepsilon_{23}$	$\varepsilon_{21}\varepsilon_{31}$	0	0
	0	$\varepsilon_{22}\varepsilon_{12}$	0	$\varepsilon_{22}\varepsilon_{21}$	ε_{22}^2	$\varepsilon_{22}\varepsilon_{23}$	0	$\varepsilon_{22}\varepsilon_{32}$	0
	0	0	$\varepsilon_{23}\varepsilon_{13}$	$\varepsilon_{23}\varepsilon_{21}$	$\varepsilon_{23}\varepsilon_{22}$	ε_{23}^2	0	0	$\varepsilon_{23}\varepsilon_{33}$
Firm 3	$\varepsilon_{31}\varepsilon_{11}$	0	0	$\varepsilon_{31}\varepsilon_{21}$	0	0	ε_{31}^2	$\varepsilon_{31}\varepsilon_{32}$	$\varepsilon_{31}\varepsilon_{33}$
	0	$\varepsilon_{32}\varepsilon_{12}$	0	0	$\varepsilon_{32}\varepsilon_{22}$	0	$\varepsilon_{32}\varepsilon_{31}$	ε_{32}^2	$\varepsilon_{32}\varepsilon_{33}$
	0	0	$\varepsilon_{33}\varepsilon_{13}$	0	0	$\varepsilon_{33}\varepsilon_{23}$	$\varepsilon_{33}\varepsilon_{31}$	$\varepsilon_{33}\varepsilon_{32}$	ε_{33}^2

The figure shows a sample covariance matrix of the residuals, $\boldsymbol{\varepsilon_{it}}$ using double clustering for firm i at time t.

5.8 Adjusting for non-normality in independent variables

As observed in figure 5-15, some independent variables violate the assumption of normality. P/E, P/B, analyst coverage and index weight are all skewed. To correct for this, we computed the natural logarithm of these variables.

Figure 5-14: Natural log of x.



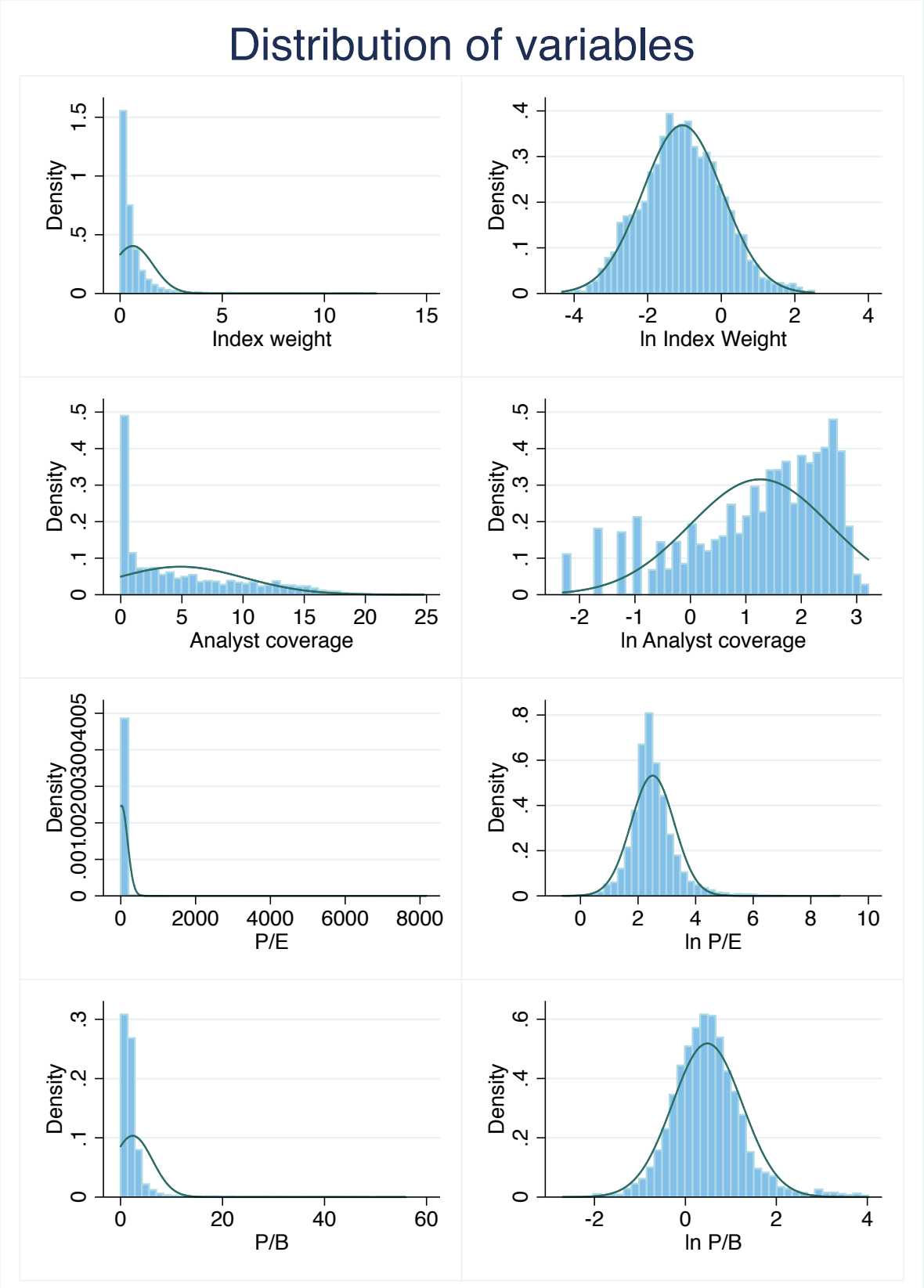
Y shows the natural logarithm of x.

We also have reasons to believe that these variables do not satisfy the assumption of linearity in parameters. For instance, this can be observed by the relationship between P/E and returns in figure 5-14. If we do not take the natural logarithm of this variable, we will for instance assume that an increase in the P/E ratio from 10 to 11 will have the same effect on returns as an increase from 100 to 101. Holding earnings constant, this would imply that a 10 and 1 % increase in price would have the same impact on future returns. As this does not make sense economically, we take the natural logarithm of this independent variable, thus change the way it is interpreted. Consequently, we get a linear-log model:

$$y_{it} = \alpha + \beta * ln\,(x_{it}) \quad (5\text{-}24)$$

In a regular linear-linear model a change of 1 unit in x would change the estimate y_{it} by β units. In our case, when we use a linear-log model, the interpretation is that a change of 1 percent in x will change our estimate, y, by $\beta/100$ units.

Figure 5-15: Distribution of variables.



Shows the density distribution of our variables before and after taking the natural logarithm. Overlaid with the corresponding normal distribution.

5.9 Collinearity between independent variables

According to assumption 2, there should be no perfect or close to perfect linearity between independent variables. Table 5-6 shows the correlation between our independent variables. As observed, there is some correlation between P/E and P/B. This is not surprising, as they have the same numerator. We also observe that the correlation between P/E and recommendation, and P/B and recommendations, are -0,36 and -0,26, respectively. This implies that companies with a high price relative to earnings and book values seem to attract more negative recommendations. Finally, we observe that analyst coverage and index weight are positively correlated, indicating that larger firms attract more analyst coverage.

Even though we find some correlation, this is not close to perfect, and we assume that the assumption holds.

Table 5-6: Correlation matrix of independent variables.

	ln P/E	ln P/B	ln Index weight	ln Analyst coverage	Recommendation consensus
ln P/E	1.0000				
ln P/B	0.3548	1.0000			
ln Index weight	0.0977	0.1878	1.0000		
ln Analyst coverage	-0.1280	0.0902	0.2899	1.0000	
Recommendation consensus	-0.3622	-0.2607	-0.0905	0.1815	1.0000

5.10 Summary of methodology

So far, we have described our empirical strategy and how our data sample has been constructed and modified to satisfy the necessary assumptions behind OLS.

We have seen that due to the characteristics of frontier markets, long holding periods will be used. We started by measuring the annualized returns 1 to 5 year ahead at the end of each month from August 2008 to August 2015. Our strategy is then to test the relationship between each variable of interest and the future returns on a monthly basis.

To test this, we use ordinary least square, which has been modified to satisfy the assumptions behind this method. Because we analyze panel data, we have to take firm- and time-specific fixed effects into account. By not doing so, we might violate assumption 6, which says that the errors should be independent on the independent variables. To account for these effects, we choose to include dummy variables for each time and firm, which produces the same coefficients as the regular fixed effects estimator.

Furthermore, we argue that serial- and cross-sectional dependence will violate assumption 5, thus produce downward biased standard errors. This might lead to type I error, meaning that we incorrectly reject the null hypothesis. To get robust estimators, we choose to double cluster the standard errors by firm and time. Clustered standard errors are also robust to heteroscedasticity, thus assumption 4 holds.

From assumption 1 and 6, we saw that OLS requires that the model is linear in its parameters and that the errors are normally distributed. To satisfy these assumptions we chose to take the natural logarithm of P/E, P/B, index weight and analyst coverage.

Finally, we observed some correlation between our independent variables. However, the correlation is far from perfect, such that assumption 2 holds. If we also assume that assumption 3 holds, then theorem 1 to 5 will hold. Consequently, our OLS produces the best linear and unbiased estimators (BLUE) conditional on our independent variables.

6. Results

In this part, we present the main results from our regressions based on equation (5-15) in section 5.6. This section is structured as follows. First, we present the results using different holding periods. As we will see, P/B and index weight are the only significant variables. Furthermore, we find the optimal holding period by comparing the effects over different time horizons. We find that most of the effects from changes in P/B and index weight diminish after 2 to 3 years. An extended analysis using 3-year holding periods is presented in section 6.3 and 6.4, where we also test the robustness of our results by running regressions on different sectors and regions.

As explained earlier, the analysis is performed using the dummy variable approach. However, because the dummy coefficients are not of direct interest, these are not reported in the tables. The regression tables are similar for all periods. In regressions (1) to (6), we systematically test each independent variable. Because we have observed some correlation among independent variables, we also chose to include regressions where some independent variables are combined. By not controlling for these variables, we might violate assumption 3. Consequently, we have included regressions (7) to (11) consisting of combinations of certain variables to make sure there are no biases. All p-values are reported for two-sided tests.

Note that more detailed regressions have been performed than reported in this section. These can be found in appendix A.

6.1 Regression results using different holding periods

The following regressions are performed on different holding periods. The regression results are similar for all holding periods. Except for 2-year holding periods, P/E shows varying degrees of significance, but the value effect is clearly better explained by P/B because P/E turns insignificant when P/B is included in the regression. Analyst coverage and the different consensus variables show little to no signs of significance. The only significance is observed for two years, where we find a positive relationship between returns and stocks with hold recommendations. However, as we do not see any systematic relationship or find an economic intuition behind this, we consider this as data mining. Index weight also show a significant effect and are consistent across all holding periods.

To summarize, we observe clear value and size effect as measured by P/B and index weight at a 99% confidence level. However, we cannot conclude that analyst coverage or consensus affect returns.

Table 6-1: Regressions using 1 year holding periods.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
VARIABLES	1y return	1y return	1y return	1y return	1y return	1y return	1y return	1y return	1y return	1y return	1y return
ln P/E	-0.0461*						0.0204				
	(-1.817)						(0.887)				
ln P/B		-0.408***					-0.416***			-0.320***	-0.321***
		(-9.275)					(-9.188)			(-5.964)	(-6.001)
ln Index Weight			-0.275***					-0.266***	-0.266***	-0.132***	-0.131***
			(-7.866)					(-6.381)	(-6.368)	(-3.273)	(-3.264)
ln Analyst coverage				0.00180				0.0122	0.0119		
				(0.105)				(0.490)	(0.465)		
Consensus					0.0206				0.0105		
					(1.183)				(0.597)		
Strong buy						0.0642		0.0438			
						(0.840)		(0.629)			
Buy						0.0589		0.0524		0.00946	
						(0.795)		(0.790)		(0.421)	
Hold						0.0822		0.0747		0.0397	
						(1.191)		(1.231)		(1.506)	
Sell						-0.00911		-0.00250		-0.0245	
						(-0.168)		(-0.0514)		(-0.701)	
Constant	0.274***	-1.005***	-1.245***	0.118	-0.461***	-0.422***	0.314***	-0.572***	-0.582***	-1.150***	-1.145***
	(3.094)	(-17.88)	(-15.58)	(1.558)	(-5.749)	(-5.057)	(3.627)	(-8.172)	(-6.470)	(-15.58)	(-15.68)
Companies	279	302	323	258	258	258	277	248	248	248	302
Observations	10,577	11,882	12,993	9,926	8,103	8,103	10,383	7,835	7,835	7,626	11,882
R-squared	0.003	0.077	0.052	0.000	0.001	0.003	0.080	0.050	0.048	0.104	0.086

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6-2: Regressions using 2 year holding periods.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
VARIABLES	2y return	2y return	2y return	2y return	2y return	2y return	2y return	2y return	2y return	2y return	2y return
ln P/E	-0.0302						0.0182				
	(-1.466)						(1.034)				
ln P/B		-0.338***					-0.347***			-0.270***	-0.233***
		(-10.50)					(-9.230)			(-5.670)	(-6.683)
ln Index Weight			-0.264***					-0.252***	-0.252***	-0.135***	-0.162***
			(-8.076)					(-5.808)	(-5.753)	(-3.662)	(-4.644)
ln Analyst coverage				-0.00158				0.00657	0.00734		
				(-0.102)				(0.292)	(0.321)		
Consensus					0.00453				-0.00290		
					(0.363)				(-0.250)		
Strong buy						0.0302		0.0274			
						(0.547)		(0.620)			
Buy						0.0322		0.0408		0.00712	
						(0.609)		(0.979)		(0.453)	
Hold						0.0559		0.0627		0.0398*	
						(1.075)		(1.557)		(1.721)	
Sell						0.00763		0.0295		0.0191	
						(0.189)		(0.860)		(0.657)	
Constant	0.353	0.350***	-0.180	-1.198***	-0.815***	-1.069***	0.379***	-1.417***	-1.360***	-0.286**	-0.0752
	(0.890)	(2.979)	(-0.553)	(-16.45)	(-15.85)	(-19.23)	(2.968)	(-18.33)	(-18.44)	(-2.023)	(-0.617)
Companies	268	288	310	241	249	249	266	235	235	241	288
Observations	9,152	10,349	11,374	8,514	6,909	6,909	8,975	6,674	6,674	6,489	10,349
R-squared	0.002	0.102	0.091	0.000	0.000	0.002	0.100	0.087	0.085	0.133	0.127

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6-3: Regressions using 3 year holding periods.

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return
ln P/E	-0.0246*						0.0103				
	(-1.651)						(0.805)				
ln P/B		-0.249***					-0.259***			-0.181***	-0.181***
		(-11.09)					(-9.435)			(-7.366)	(-7.376)
ln Index Weight			-0.188***					-0.178***	-0.178***	-0.107***	-0.106***
			(-8.061)					(-5.808)	(-5.739)	(-4.539)	(-4.518)
ln Analyst coverage				-0.00411				-0.00739	-0.00496		
				(-0.351)				(-0.440)	(-0.291)		
Consensus					0.00381				-0.00102		
					(0.388)				(-0.106)		
Strong buy						0.0384		0.0332			
						(1.037)		(0.936)			
Buy						0.0462		0.0476		0.00729	
						(1.318)		(1.427)		(0.831)	
Hold						0.0467		0.0447		0.00884	
						(1.338)		(1.412)		(0.762)	
Sell						0.0298		0.0398*		0.0123	
						(1.354)		(1.941)		(1.200)	
Constant	-0.548***	-0.237***	-0.674***	-0.550	-0.550	-0.547	-0.211***	-0.768***	-0.730***	0.0751	0.0751
	(-21.29)	(-8.604)	(-44.18)				(-6.294)	(-13.27)	(-12.08)	(1.204)	(1.200)
Companies	244	266	288	224	228	228	243	220	220	220	266
Observations	7,481	8,594	9,533	6,912	5,539	5,539	7,321	5,355	5,355	5,185	8,594
R-squared	0.003	0.100	0.078	0.000	0.000	0.001	0.107	0.073	0.071	0.152	0.119

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6-4: Regressions using 4 year holding periods.

VARIABLES	(1) 4y return	(2) 4y return	(3) 4y return	(4) 4y return	(5) 4y return	(6) 4y return	(7) 4y return	(8) 4y return	(9) 4y return	(10) 4y return	(11) 4y return
ln P/E	-0.0225**						0.00108				
	(-2.513)						(0.157)				
ln P/B		-0.177***					-0.181***			-0.136***	-0.136***
		(-10.79)					(-9.139)			(-7.514)	(-7.566)
ln Index Weight			-0.130***					-0.120***	-0.121***	-0.0647***	-0.0647***
			(-8.122)					(-6.593)	(-6.645)	(-4.296)	(-4.299)
ln Analyst coverage				-0.00301				-0.00944	-0.00784		
				(-0.335)				(-0.751)	(-0.615)		
Consensus					-0.000412				-0.00555		
					(-0.0560)				(-0.751)		
Strong buy						0.00521		-0.00250			
						(0.209)		(-0.107)			
Buy						0.0229		0.0159		0.0102	
						(0.960)		(0.751)		(1.594)	
Hold						0.0127		0.0103		0.00128	
						(0.554)		(0.539)		(0.170)	
Sell						-0.00165		0.00424		-0.00186	
						(-0.103)		(0.286)		(-0.213)	
Constant	-0.193***	0.0669***	-0.146***	-0.0857***	-0.280***	-0.422***	0.0231	-0.519***	-0.522***	-0.192***	-0.195***
	(-8.881)	(9.668)	(-17.04)	(-6.788)	(-6.100)	(-13.76)	(0.655)	(-9.419)	(-9.389)	(-7.966)	(-8.041)
Companies	226	248	270	207	209	209	225	203	203	201	248
Observations	5,946	6,902	7,773	5,485	4,409	4,409	5,798	4,252	4,252	4,094	6,902
R-squared	0.003	0.065	0.044	0.000	0.000	0.001	0.070	0.044	0.042	0.081	0.074

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6-5: Regressions using 5 year holding periods.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
VARIABLES	5y return	5y return	5y return	5y return	5y return	5y return	5y return	5y return	5y return	5y return	5y return
ln P/E	-0.0196***						-0.00201				
	(-2.755)						(-0.504)				
ln P/B		-0.147***					-0.156***			-0.111***	-0.111***
		(-11.03)					(-11.12)			(-6.816)	(-6.823)
ln Index Weight			-0.114***					-0.116***	-0.116***	-0.0593***	-0.0592***
			(-8.620)					(-6.969)	(-6.958)	(-4.351)	(-4.358)
ln Analyst coverage				-0.00409				-0.00617	-0.00555		
				(-0.808)				(-0.825)	(-0.713)		
Consensus					-0.00325				-0.00285		
					(-0.625)				(-0.619)		
Strong buy						-0.00858		0.00667			
						(-0.518)		(0.493)			
Buy						-0.00637		0.0106		0.000699	
						(-0.411)		(0.876)		(0.179)	
Hold						0.00681		0.0209*		0.00509	
						(0.471)		(1.808)		(1.065)	
Sell						-0.000677		0.0186		0.00567	
						(-0.0452)		(1.621)		(0.855)	
Constant	0.0500*	-0.266***	-0.489***	-0.0846***	-0.0269	-0.226	0.207***	-0.0595**	-0.0361	-0.359***	-0.359***
	(1.765)	(-35.08)	(-26.15)	(-6.436)	(-1.395)		(22.36)	(-2.314)	(-1.332)	(-15.59)	(-15.54)
Companies	213	223	257	191	195	195	212	190	190	187	223
Observations	4,472	5,228	5,922	4,044	3,198	3,198	4,350	3,068	3,068	2,943	5,228
R-squared	0.003	0.045	0.032	0.000	0.000	0.000	0.053	0.035	0.034	0.050	0.052

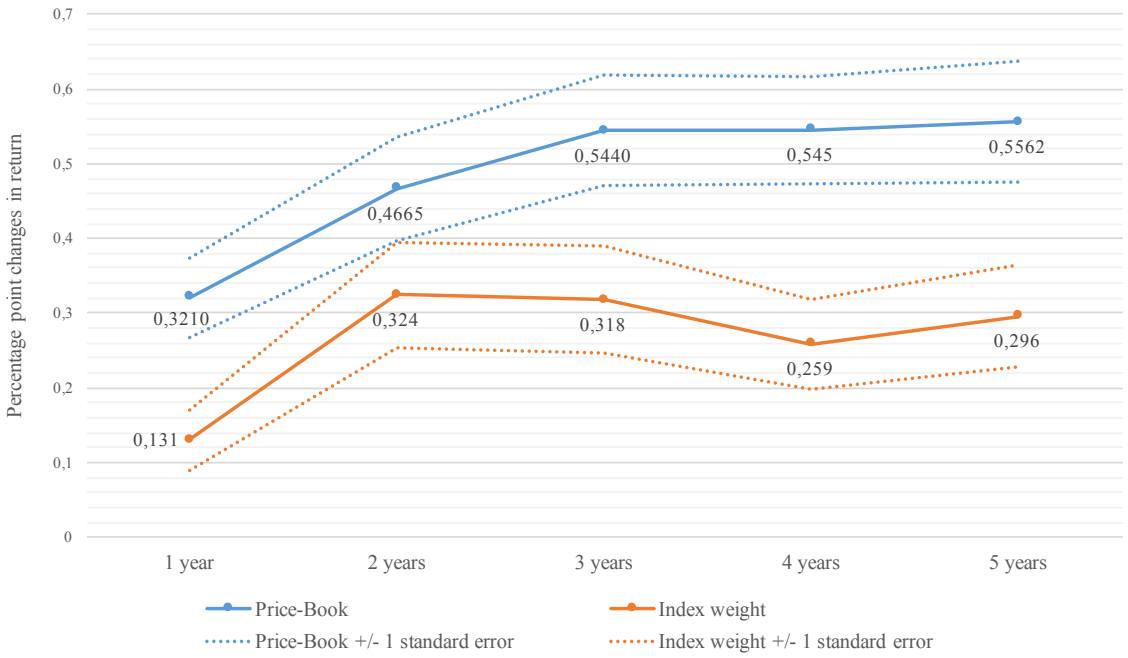
t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.2 Optimal holding period

Even though the effects are significant for all holding periods, coefficients diminish when the holding periods increase. This indicates that value and size effect diminish over time. To determine the most efficient holding period for further analysis we have estimated a term structure in figure 6-1.

Figure 6-1: Term structure.



Shows the estimated total changes in returns for different holding periods by reducing P/B and index weight by 1% with corresponding standard errors.

The structure indicate that P/B and index weight mainly affect returns 2 and 3 years ahead. More precisely, we observe that changes in P/B have little effect on returns after 3 years. For index weight, we only observe an effect in the first and second year. In third and fourth year, the effect is negative. Based on the term structure we suggest using a 3 year holding period as it captures what is mainly needed to fully capitalize on these factors. However, it can be discussed whether it might be more optimal to use shorter periods, as the strongest effects are observed in year 1 and 2.

By looking at the 1 standard deviation prediction interval, we also observe that the optimal holding period vary among companies. Due to less observations when longer periods are used, uncertainty around our estimates increases as holding periods are longer.

6.3 Interpretation of the results

We have already found statistically significant value and size effects. To illustrate our findings, we have computed what changes in these variables imply for expected future returns. Our interpretations can be found in table 6-6.

Table 6-6: Implied return changes.

Decrease with	P/B		Index Weight	
	Annualized	Total	Annualized	Total
1 %	0,181 %	0,544 %	0,106 %	0,318 %
10 %	1,907 %	5,831 %	1,117 %	3,388 %
50 %	12,546 %	42,557 %	7,347 %	23,701 %
One standard deviation	13,032 %	44,412 %	11,236 %	37,637 %

Illustrates how a decrease in P/B and index weight affect returns 3 years ahead. As observed, P/B and index weight have significant impact on future returns.

6.4 Robustness; regressions on sectors and regions

To test the robustness of our findings we have run regressions on different sectors and regions. The regressions include P/B and index weight, and are performed using 3 year holding periods. Regression tables including all variables can be found in appendix A.

Table 6-7: Sector regressions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
VARIABLES	Financials	Consumer discretionary	Consumer staples	Healthcare	Energy	Industrials	IT	Materials	Telecom	Utilities	Others
ln Index Weight	-0.0943***	0.0221	-0.217***	-0.0738	-0.316***	-0.124*	-0.440*	0.00196	-0.0655	-0.102**	-0.112**
	(-2.971)	(0.107)	(-2.877)	(-0.844)	(-4.928)	(-1.962)	(-1.702)	(0.0306)	(-1.318)	(-2.361)	(-2.256)
ln P/B	-0.214***	-0.0697	-0.0786	-0.0498**	-0.0417	-0.196***	-0.100	-0.310**	-0.271***	-0.0971**	-0.0724
	(-6.782)	(-0.903)	(-1.504)	(-2.557)	(-0.577)	(-2.938)	(-0.504)	(-2.361)	(-3.388)	(-2.447)	(-0.690)
Constant	-0.510***	0.0897	-0.397***	-0.0888	0.226***	0.153***	-0.888	-0.195	0.201***	0.306***	-0.525***
	(-18.21)	(0.135)	(-4.673)	(-1.537)	(11.25)	(6.812)	(-1.146)	(-0.822)	(2.795)	(5.406)	(-6.771)
Companies	127	9	21	4	20	26	2	21	19	14	3
Observations	4,047	174	521	139	825	818	57	679	868	324	142
R-squared	0.108	0.002	0.116	0.008	0.368	0.214	0.063	0.099	0.140	0.030	0.008

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regression results from all different sectors when regressed on P/B and index weight.

As observed in table 6-7, index weight and P/B are not significant in each sector. The most notable violations may be for consumer discretionary and materials as they show opposite size effects. However, most coefficients have negative signs, which indicates that value and size effects exist. In general, the number of companies in each sector is relatively low. This might explain why we get insignificant results.

Table 6-8: Regional regressions

VARIABLES	(1) Africa	(2) Americas	(3) Asia	(4) Europe CIS	(5) Middle East
ln Index Weight	-0.133**	-0.114	-0.196***	-0.101***	-0.0839***
	(-2.045)	(-0.495)	(-4.885)	(-2.669)	(-2.741)
ln P/B	-0.125**	-0.217*	-0.142***	-0.179***	-0.169***
	(-2.425)	(-1.944)	(-3.053)	(-4.984)	(-3.966)
Constant	-0.647	0.356	-0.339***	-0.654***	-0.947***
			(-3.249)	(-9.673)	(-10.11)
Companies	39	9	58	53	107
Observations	1,088	291	1,711	1,566	3,938
R-squared	0.071	0.073	0.158	0.152	0.078

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regression results from all different regions when regressed on P/B and index weight.

Table 6-8 shows similar regressions on the different regions. We observe that all regions, except Americas, have significant coefficients for P/B and index weight. As Americas consist of only 9 companies there are probably too few observations to get significant results. However, the signs are still negative.

7. Discussion

In our results, we found significant value and size effects in frontier markets. By investing in small companies and companies with relatively low P/B ratios, investors were able to increase their returns during our sample period. These results seem robust as similar results are observed in different regions. We did not find the same systematic relationships across all sectors. This might be due to few observations for all sectors except for finance. However, we have seen that most coefficients are negative.

When P/B were controlled for, we did not find any significant relationships between returns and P/E. Consequently, P/B seems like the best measure for the relative value of a company. There might be two reasons for this. First, earnings are based on historical values. It can be thought that book values to some degree reflect the future earnings of a company's assets. This might explain why P/B seems to be a better predictor for future performance. Using forecasted earnings might therefore be a better approach. Secondly, when companies report periods with low earnings, this might result in extreme P/E-values. In such a case P/E will rise quite significantly while P/B might be reduced. P/B might therefore be a more consistent measure of value as the book value will remain relatively stable. Finally, it should be emphasized that P/B is often a more convenient way to measure value. As P/E is often negative, thus not reported, and P/B is in most cases positive, P/B leaves us with most observations.

Also for analyst coverage, we did not observe any effect on returns. One potential challenge with this variable is that analyst coverage has increased significantly during our sample period. However, because fixed time-effects are controlled for, this should not affect our results. The question is then whether our interpretation of analyst coverage as a contrarian factor is correct. Based on research showing that the great majority of analyst recommendations are positive, and upward revisions affect returns positively, we have tested whether increased coverage will lead to increased future returns. Alternatively, it could be argued that it is easier to find mispriced stocks among under-analyzed companies. Stocks might be priced both above and below fair value, such that using analyst coverage itself would be a poor predictor of future returns. To account for this, one could double sort portfolios by analyst coverage and a measure representing relative value, such as P/B. This could capture under-analyzed companies that are priced below fair value, and one could test whether these outperform stocks with opposite characteristics. We leave this to further research.

We also observe that consensus was insignificant for all time periods. As we have seen, neither the dummy variables nor the non-binary variable were significant, both used separate and combined with other independent variables. A crucial question is whether analyst consensus is a good proxy for popularity. For instance, it should be questioned whether consensus actually represents the analyst's opinions and are not affected by the investment banks' own commercial interests. Another potential issue is whether analyst consensus can be assumed to represent the broad market's view. A natural extension of our research would be to test for other variables that might work as proxies for popularity.

One such variable could be short sales relative to the total number of outstanding shares. If short-sellers help exaggerate a negative momentum, this may be exploited by long-term investors. This would, however, imply that short-sellers are momentum traders and not contrarian. However, obtaining reliable numbers on short sales might be difficult in frontier markets.

A second variable could be the amount of media coverage, as it can be thought that popular companies are more likely to attract attention in the media, and also more positive media coverage. The hypothesis could for instance be that stock prices overreact on negative news.

A final approach could be to test for momentum. In a contrarian perspective, we could test whether stocks that have performed poorly are likely to outperform in the future. Including the relative strength index (RSI) as an independent variable could be one way to perform such an analysis.

In addition to P/B, index weight was also significant for all periods. While interpreting the index weight, it is worth to emphasize that this variable is based on free float market capitalization and does not represent the total market capitalization of a company. A high ratio between free float market capitalization to total market capitalization probably indicate the share turnover is high relative to a company with a low ratio. Hence, it can be asked whether this variable also includes a liquidity effect. An extension to our analysis, could therefore be to control for liquidity. However, as size is not considered to be a contrarian factor, this is not relevant in this thesis.

In our analysis, we used 3 years as the optimal holding period. It is important to take into consideration that the optimal holding period will depend on direct and indirect transactions costs, which naturally will vary among different companies and sub-markets. Hence, one

should notice that this is just an indication of how long it will take to capitalize fully on each factor. The optimal holding period should therefore be considered independently for each investment.

Finally, we think it is important to note that MSCI has the smallest sample. MSCI ignores companies considered as small caps relative to frontier markets. As S&P and FTSE's indices consists of 500 and 328 companies, respectively, the smallest companies in our sample are large compared to the small companies in the other two indices. Financials are also heavily overrepresented, and so far, we have not seen the same effects in all other sectors. To conclude whether the results are robust in all sectors, we probably would need a larger sample. This is a good argument for doing similar analyses on other index providers like S&P and FTSE, given that enough observations can be obtained. However, in spite of a smaller sample, using MSCI provides us with the most observations on the different variables chosen. As MSCI also have the strictest requirements for inclusion, we believe it makes sense to use their index as it probably represents a more realistic investment universe for institutional investors with minimum liquidity requirements.

8. Concluding remarks

Skagen Funds is a contrarian investor, seeking under-valued, unpopular and under-analyzed companies. Based on their strategy and previous research, we have tested whether certain contrarian factors can be used to predict long-term stock returns in frontier markets. To identify under-valued companies, we have used price-book (P/B) and price-earnings (P/E). We use analyst coverage and analyst consensus for under-analyzed and unpopular, assuming that analysts represent the broad market's opinions. Due to potential violations of the assumptions behind OLS, we also control for free-float adjusted index weights, as a proxy for size.

The research makes use of data from 323 companies from 27 countries included in the MSCI Frontier Markets Index from August 2008 to August 2015. The thesis and the problems we try to answer can be divided into five different hypotheses and corresponding conclusions.

The first hypothesis is that there is a negative relationship between P/B and long-term returns, i.e. 1 to 5 years. We find a significant and negative relationship for all holding periods when regressions are run on the whole data sample, hence the corresponding null hypothesis is rejected at the 1 % significance level. By adding a term structure to our analysis, we find that the effects from changes in P/B are diminishing over time, and the strongest effects are observed during the first 3 years. Our results are robust across sectors and regions, as we also obtain coefficients with the same sign when regressions are run separately on these markets, using 3 year holding periods. However, coefficients are insignificant in a few sub-markets, but this might be due to a low number of observations.

The second hypothesis is that there is a negative relationship between price-earnings and long-term returns, i.e. 1 to 5 years. We do not find any systematic relationship between P/E and returns when P/B is controlled for. When P/B is ignored, P/E is significant, except for 2 year holding periods. However, because these measures share the same numerator, they naturally correlate. We therefore conclude that the returns are better explained by P/B. Consequently, we do not reject the null hypothesis.

The third hypothesis suggest that there is a negative relationship between index weight and long-term returns, i.e. 1 to 5 years. Similar to P/B, we find a significant negative relationship between index weight and returns. By adding a term structure, we find that the effect on returns

is diminishing over time, with the strongest effect observed in the first and second year. The null hypothesis is therefore rejected at the 1 % significance level.

Our fourth and fifth hypothesis is that there are negative relationships between 1 to 5 year returns, and consensus and analyst coverage, respectively. We do not find any significant relationships for these variables. Thus, both corresponding null hypotheses are retained. However, finding good proxies for popularity might be difficult. For further research, we therefore suggest testing for alternative proxies. This might for instance be the number of short sales for each particular stock, media coverage and momentum. Alternatively, one could test for different combination of the explanatory variables included in our thesis. For instance, by testing future returns of the companies with lowest P/B conditional on the amount of analyst coverage or consensus level.

A short summary of hypotheses and conclusions can be found in table 8-1.

Table 8-1: Conclusion summary.

Hypothesis	Conclusion
1. P/B	Yes. We find a significant and consistent value effect as measured by P/B.
2. P/E	Partly. Usually significant when included alone, but not significant in combination with P/B.
3. Index weight	Yes. We find a significant and consistent size effect as measured by index weight.
4. Analyst coverage	No. We do not find any systematic relationship between analyst coverage and returns, but argue that mispricing among these may be easier to find for bottom-up investors.
5. Analyst consensus	No. We do not find any systematic relationship between analyst consensus and returns.

Summary of the 5 different conclusions tested in this thesis.

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Appendix A: Regressions on different sectors and regions

In this part we present regressions for each sector and region, except for Americas, Consumer Discretionary, Healthcare, IT and Others. These were not reported as too few observations were available to perform an extended analysis. The regressions including P/B and index weight are similar to those reported in section 6-4. Because the dummy coefficients are not of direct interest, these are not reported. Regression (1) to (9) are similar in each table in the sense that the same independent variables included. Regression (10) and onwards are different from each panel. The choice of variables in these regressions are based on the findings in regressions (1) to (9). We have also controlled for variables that we suspect will lead to violations of assumption 6 behind OLS.

Note that more regressions have been performed than actually reported. We have chosen to not report all results, because this would provide the reader with more information than we consider as relevant. However, our main findings, including significant coefficients are reported.

Regression panel I: Financials

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
VARIABLES	3y return	3y return	3y return	3y return	3y return	3y return	3y return	3y return	3y return	3y return	3y return	3y return	3y return	3y return
ln P/E	-0.00933		0.0207											
	(-0.572)		(1.503)											
ln P/B		-0.277***	-0.303***							-0.230***	-0.230***	-0.242***	-0.214***	-0.275***
		(-8.307)	(-7.514)							(-5.400)	(-5.471)	(-5.927)	(-6.782)	(-6.747)
ln Index Weight							-0.165***	-0.140***	-0.141***	-0.0613	-0.0625*	-0.0697*	-0.0943***	
							(-4.937)	(-3.252)	(-3.289)	(-1.620)	(-1.661)	(-1.833)	(-2.971)	
ln Analyst coverage				-0.0256**				-0.0334	-0.0338*			-0.0203**		
				(-2.246)				(-1.611)	(-1.661)			(-2.035)		
Consensus					-0.0131				-0.0188		-0.0228*			-0.0225*
					(-0.933)				(-1.402)		(-1.823)			(-1.766)
Strong buy						-0.0336		-0.0439		-0.0457*				
						(-0.744)		(-1.078)		(-1.774)				
Buy						-0.0221		-0.0292						
						(-0.538)		(-0.794)						
Hold						-0.00331		-0.0129						
						(-0.0819)		(-0.374)						
Sell						0.000149		-0.00655						
						(0.00428)		(-0.237)						
Constant	-0.169***	-0.298***	-0.250***	-0.0299	-0.540	-0.554	-0.622***	-0.743***	-0.615***	0.185	0.253	0.136***	-0.510***	0.0395
	(-3.957)	(-28.65)	(-4.291)				(-40.22)	(-5.028)	(-4.209)			(2.990)	(-18.21)	(0.651)
Companies	116	127	116	102	103	103	141	100	100	99	99	97	127	99
Observations	3,394	4,047	3,368	3,196	2,526	2,526	4,554	2,455	2,455	2,314	2,314	2,956	4,047	2,314
R-squared	0.702	0.769	0.795	0.675	0.672	0.672	0.747	0.725	0.725	0.760	0.761	0.769	0.786	0.754

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Regression panel II: Comsumer Staples

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return	(12) 3y return
ln P/E	-0.180***		-0.109*							0.0125		
	(-2.629)		(-1.723)							(0.402)		
ln P/B		-0.171***	-0.112***							-0.0151	-0.0323	-0.0786
		(-3.112)	(-2.621)							(-0.434)	(-0.716)	(-1.504)
ln Index Weight							-0.267***	-0.245***	-0.242***	-0.214***	-0.242***	-0.217***
							(-4.533)	(-5.221)	(-4.648)	(-3.040)	(-3.202)	(-2.877)
ln Analyst coverage				-0.0260				-0.0226	-0.0209			
				(-0.643)				(-0.982)	(-0.908)			
Consensus					0.0319				0.0358*	0.0393***	0.0118	
					(1.062)				(1.842)	(3.566)	(0.655)	
Strong buy						0.128		0.105				
						(1.337)		(1.413)				
Buy						0.0775		0.116*				
						(1.022)		(1.950)				
Hold						0.0566		0.0798				
						(0.780)		(1.423)				
Sell						0.0602**		0.0604*				
						(2.014)		(1.767)				
Constant	0.363	-0.0425	0.220	-0.104***	-0.230	-0.284*	-0.790***	-0.963***	-1.025***	-0.881***	-0.308	-0.397***
	(1.406)	(-0.546)	(1.041)	(-2.938)	(-1.253)	(-1.746)	(-4.281)	(-5.364)	(-4.961)	(-4.039)	(-0.973)	(-4.673)
Companies	20	21	21	17	18	18	22	17	17	18	18	21
Observations	503	521	456	424	332	332	630	317	317	254	283	521
R-squared	0.768	0.837	0.796	0.742	0.782	0.785	0.869	0.901	0.897	0.909	0.894	0.888

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Regression panel III: Energy

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return	(12) 3y return	(13) 3y return
ln P/E	-0.0949***		-0.0461								-0.0419*	-0.0438**	-0.0360*
	(-2.932)		(-1.261)								(-1.949)	(-2.050)	(-1.787)
ln P/B		-0.260***	-0.232***							-0.0452			
		(-4.316)	(-3.133)							(-0.601)			
ln Index Weight							-0.352***	-0.351***	-0.341***	-0.322***	-0.336***	-0.338***	-0.335***
							(-10.07)	(-12.12)	(-11.18)	(-4.995)	(-11.34)	(-10.40)	(-8.736)
ln Analyst coverage				0.0655**				0.00438	0.0110				
				(2.416)				(0.144)	(0.358)				
Consensus					0.0290				0.00421				
					(0.941)				(0.341)				
Strong buy						0.158		0.0476		0.0386	0.0334		
						(1.282)		(1.222)		(0.913)	(0.669)		
Buy						0.190		0.0691**		0.0581	0.0585		
						(1.562)		(1.974)		(1.418)	(1.325)		
Hold						0.174*		0.0268		0.0162	0.0260		
						(1.659)		(0.740)		(0.401)	(0.629)		
Sell						0.0307		0.0838**		0.0853**	0.0938**	0.0656**	
						(0.377)		(2.295)		(2.251)	(2.576)	(2.448)	
Constant	0.442***	0.0476	0.160	0.0749	-0.00369	-0.0941	-1.313***	-0.631***	-0.574***	-0.501***	-0.479***	-0.443***	0.389***
	(4.290)	(0.503)	(1.270)	(1.323)	(-0.0301)	(-0.618)	(-9.932)	(-8.416)	(-8.502)	(-3.078)	(-3.673)	(-3.352)	(54.01)
Companies	18	20	18	19	19	19	21	19	19	19	17	17	18
Observations	760	825	754	761	650	650	885	633	633	625	593	593	760
R-squared	0.470	0.654	0.654	0.487	0.454	0.481	0.768	0.805	0.797	0.810	0.817	0.813	0.777

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Regression panel IV: Industrials

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return	(12) 3y return
ln P/E	-0.00544		0.0335*							0.0238	0.0265*	
	(-0.160)		(1.893)							(1.286)	(1.838)	
ln P/B		-0.287***	-0.306***							-0.249***	-0.215***	-0.196***
		(-5.344)	(-5.097)							(-3.601)	(-2.751)	(-2.938)
ln Index Weight							-0.256***	-0.168*		-0.0925	-0.121*	-0.124*
							(-3.934)	(-1.743)		(-1.405)	(-1.776)	(-1.962)
ln Analyst coverage				-0.0249				-0.0461	-0.0527*	0.000428		
				(-1.544)				(-1.525)	(-1.955)	(0.0256)		
Consensus					-0.0112				-0.00999			
					(-0.570)				(-0.531)			
Strong buy						0.000977		0.00460				
						(0.0143)		(0.125)				
Buy						0.0202		0.0454				
						(0.332)		(1.396)				
Hold						0.0480		0.0413				
						(0.870)		(0.995)				
Sell						0.000655		0.0137				
						(0.0160)		(0.311)				
Constant	-0.0964	-0.251***	-0.160**	0.116***	-0.224	0.142	-0.940***	-0.350	0.124	-0.0934	-0.223***	0.153***
	(-0.868)	(-3.542)	(-1.964)	(3.636)	(-1.375)		(-5.602)	(-1.581)		(-0.473)	(-4.182)	(6.812)
Companies	25	26	25	22	22	22	26	20	20	20	25	26
Observations	727	818	725	555	415	415	836	404	404	522	725	818
R-squared	0.655	0.852	0.854	0.722	0.745	0.748	0.821	0.813	0.753	0.872	0.875	0.873

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Regression panel V: Materials

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return
ln P/E	-0.0381		0.0274							
	(-0.538)		(0.421)							
ln P/B		-0.308***	-0.321**							-0.310**
		(-2.868)	(-2.348)							(-2.361)
ln Index Weight							-0.118*	-0.126*	-0.125*	0.00196
							(-1.701)	(-1.737)	(-1.745)	(0.0306)
ln Analyst coverage				0.0369				0.0474	0.0509	
				(0.924)				(0.650)	(0.715)	
Consensus					0.0111				0.0178	
					(0.677)				(1.029)	
Strong buy						0.0509		0.0602		
						(0.900)		(0.782)		
Buy						0.0507		0.0673		
						(1.049)		(1.007)		
Hold						0.0465		0.0536		
						(1.020)		(0.784)		
Sell						0.0430		0.0212		
						(0.865)		(0.289)		
Constant	-0.190	-0.200***	-0.0902	-0.232	-0.486***	-0.474***	-0.632***	-0.927***	-0.927***	-0.195
	(-1.118)	(-2.817)	(-0.451)	(-1.482)	(-4.533)	(-4.671)	(-2.994)	(-3.821)	(-3.772)	(-0.822)
Companies	20	21	20	18	20	20	23	18	18	21
Observations	624	679	623	548	447	447	736	417	417	679
R-squared	0.602	0.719	0.697	0.675	0.690	0.690	0.670	0.720	0.720	0.719

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Regression panel VI: Telecommunication Services

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return
ln P/E	-0.0661		0.00466								
	(-1.317)		(0.114)								
ln P/B		-0.310***	-0.346***							-0.293***	-0.304***
		(-4.401)	(-6.954)							(-3.836)	(-3.933)
ln Index Weight							-0.140**	-0.171***	-0.156**	-0.0946**	-0.0734*
							(-2.517)	(-2.967)	(-2.551)	(-2.108)	(-1.667)
ln Analyst coverage				0.0676***				0.108***	0.123***	0.0842**	0.0409**
				(3.456)				(3.136)	(3.222)	(2.373)	(2.070)
Consensus					0.00344				0.00166		
					(0.123)				(0.0725)		
Strong buy						0.127**		0.0965**		-0.00716	
						(2.067)		(2.031)		(-0.231)	
Buy						0.133***		0.116***		0.0218	
						(3.241)		(3.872)		(0.655)	
Hold						0.179***		0.155***		0.0608**	
						(3.051)		(5.149)		(2.388)	
Sell						0.136***		0.132***		0.0573*	
						(3.401)		(4.094)		(1.833)	
Constant	-0.276*	-0.176***	-0.384***	0.276***	0.303**	0.125	-0.313**	0.0687	0.258*	0.821***	0.837***
	(-1.880)	(-19.57)	(-4.043)	(10.86)	(2.025)	(1.595)	(-2.132)	(0.562)	(1.785)	(4.625)	(3.973)
Companies	18	19	18	18	18	18	20	18	18	17	17
Observations	779	868	769	776	649	649	897	628	628	614	761
R-squared	0.618	0.668	0.732	0.629	0.595	0.618	0.612	0.740	0.721	0.768	0.734

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regression panel VII: Utilities

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return
ln P/E	-0.0397**		-0.0251*							-0.0214	-0.0133
	(-2.253)		(-1.807)							(-1.520)	(-1.083)
ln P/B		-0.142**	-0.0771*					-0.0892***	-0.0971**		-0.0528*
		(-2.442)	(-1.905)					(-2.925)	(-2.447)		(-1.966)
ln Index Weight						-0.135***	-0.0902***	-0.0832**	-0.102**	-0.112**	-0.100**
						(-3.083)	(-3.169)	(-2.265)	(-2.361)	(-2.187)	(-2.112)
ln Analyst coverage				0.0256			0.0626***	0.0168			
				(0.964)			(3.151)	(0.785)			
Consensus					0.00790		-0.00651				
					(0.268)		(-0.324)				
Constant	-0.177***	-0.0523	0.0386	0.0947*	-0.00279	-0.276**	-0.0667	-0.287***	0.306***	0.00129	0.0670
	(-4.935)	(-0.562)	(0.649)	(1.966)	(-0.0422)	(-2.031)	(-0.769)	(-2.996)	(5.406)	(0.00640)	(0.342)
Companies	10	14	10	12	12	15	12	12	14	10	10
Observations	219	324	219	229	216	367	200	228	324	219	219
R-squared	0.909	0.924	0.916	0.942	0.950	0.920	0.968	0.961	0.933	0.925	0.928

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regression panel VIII: Africa

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return	(12) 3y return
ln P/E	-0.0572		-0.0235									
	(-1.126)		(-0.568)									
ln P/B		-0.175***	-0.139**							-0.103**	-0.131**	-0.125**
		(-2.892)	(-2.135)							(-2.019)	(-2.229)	(-2.425)
ln Index Weight							-0.186***	-0.133**		-0.0977*		-0.133**
							(-3.137)	(-2.090)		(-1.712)		(-2.045)
ln Analyst coverage				-0.0699**				-0.0847	-0.113**	-0.0712***	-0.0767***	
				(-2.427)				(-1.588)	(-1.965)	(-2.642)	(-2.615)	
Consensus					0.00716				-0.00406			
					(0.295)				(-0.181)			
Strong buy						0.0531		0.0148				
						(0.740)		(0.205)				
Buy						0.0492		0.0317				
						(0.926)		(0.525)				
Hold						0.0611		0.0408				
						(1.216)		(0.724)				
Sell						0.0219		0.0261				
						(0.716)		(0.661)				
Constant	-0.507***	-0.417***	-0.388***	-0.684***	-0.0567*	-0.0562	-0.445***	-0.384***	-0.289***	-0.710***	-0.687***	-0.647
	(-3.090)	(-5.179)	(-2.664)	(-56.48)	(-1.905)		(-10.32)	(-6.131)	(-3.810)	(-3.463)	(-3.987)	
Companies	37	39	37	36	38	38	42	36	36	33	33	39
Observations	922	1,088	845	1,089	933	933	1,391	895	895	878	878	1,088
R-squared	0.752	0.767	0.774	0.795	0.781	0.783	0.792	0.833	0.809	0.821	0.806	0.793

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Regression panel IX: Asia

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return	(12) 3y return
ln P/E	-0.0662		0.0122									
	(-1.574)		(0.338)									
ln P/B		-0.275***	-0.329***							-0.176**	-0.187**	-0.142***
		(-5.340)	(-5.099)							(-2.211)	(-2.300)	(-3.053)
ln Index Weight							-0.280***	-0.264***	-0.265***	-0.172***	-0.164***	-0.196***
							(-7.847)	(-6.074)	(-5.978)	(-4.530)	(-4.056)	(-4.885)
ln Analyst coverage				0.00370				0.0312	0.0311	0.0206		
				(0.190)				(1.347)	(1.345)	(0.976)		
Consensus					-0.00795				-0.0135	-0.0160	-0.0161	
					(-0.582)				(-1.246)	(-1.375)	(-1.390)	
Strong buy						-0.0499		-0.0205				
						(-0.533)		(-0.339)				
Buy						-0.0594		-0.00560				
						(-0.645)		(-0.0963)				
Hold						-0.0321		0.00534				
						(-0.349)		(0.0944)				
Sell						-0.0216		0.0277				
						(-0.246)		(0.505)				
Constant	0.265	0.168***	0.0610	0.150**	-0.142***	-0.164***	-0.812***	-0.858***	-0.798***	0.434**	0.351*	-0.339***
	(1.391)	(2.847)	(0.473)	(2.133)	(-2.871)	(-4.017)	(-7.994)	(-7.178)	(-5.547)	(2.063)	(1.661)	(-3.249)
Companies	45	58	45	44	45	45	69	43	43	43	45	58
Observations	1,441	1,711	1,439	1,181	993	993	2,038	938	938	936	991	1,711
R-squared	0.621	0.779	0.767	0.639	0.602	0.604	0.805	0.746	0.745	0.766	0.750	0.818

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Regression panel X: Europe

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return	(12) 3y return	(13) 3y return	(14) 3y return	(15) 3y return
ln P/E	-0.0334		0.0268**							0.0223*	0.0226				
	(-1.332)		(2.171)							(1.709)	(1.629)				
ln P/B		-0.244***	-0.268***							-0.246***	-0.240***	-0.242***	-0.291***	-0.295***	-0.250***
		(-7.190)	(-7.614)							(-5.751)	(-5.299)	(-6.294)	(-9.973)	(-9.108)	(-6.347)
ln Index Weight							-0.171***	-0.152***	-0.153***	-0.0721**	-0.0672*	-0.0540			-0.0589*
							(-3.582)	(-2.921)	(-2.966)	(-2.002)	(-1.858)	(-1.646)			(-1.868)
ln Analyst coverage				0.0422*				0.0512**	0.0531**	0.0348**	0.0327*	0.0323*	0.0335*		
				(1.868)				(2.192)	(2.270)	(2.089)	(1.899)	(1.952)	(1.876)		
Consensus					0.0359*				0.0243		0.0267**	0.0202**	0.0217**	0.0218**	
					(1.845)				(1.235)		(2.554)	(2.247)	(2.128)	(2.018)	
Strong buy						0.143*		0.0960		0.0804**					
						(1.956)		(1.429)		(2.564)					
Buy						0.137**		0.0891		0.0478*					
						(1.968)		(1.290)		(1.686)					
Hold						0.107*		0.0592		0.0149					
						(1.836)		(1.198)		(0.527)					
Sell						0.0435		0.0443		0.0481***					
						(1.059)		(0.954)		(2.705)					
Constant	-0.235***	0.136	-0.571***	-0.396***	-0.329***	-0.323***	-0.787***	-0.846***	-0.861***	-0.812***	-0.842***	-0.763***	-0.248***	-0.277***	-0.266***
	(-4.562)		(-7.202)	(-7.093)	(-4.938)	(-3.850)	(-6.867)	(-6.890)	(-7.001)	(-13.36)	(-14.58)	(-12.09)	(-4.115)	(-5.097)	(-5.329)
Companies	49	53	49	47	49	49	58	47	47	39	39	43	43	44	44
Observations	1,310	1,566	1,296	1,396	1,111	1,111	1,762	1,062	1,062	767	767	914	914	949	949
R-squared	0.656	0.834	0.816	0.689	0.700	0.705	0.787	0.775	0.774	0.872	0.869	0.868	0.863	0.859	0.860

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regression panel XI: Middle East

VARIABLES	(1) 3y return	(2) 3y return	(3) 3y return	(4) 3y return	(5) 3y return	(6) 3y return	(7) 3y return	(8) 3y return	(9) 3y return	(10) 3y return	(11) 3y return	(12) 3y return	(13) 3y return	(14) 3y return
ln P/E	-0.00585		0.00477											
	(-0.344)		(0.294)											
ln P/B		-0.223***	-0.228***							-0.138***	-0.142***	-0.142***	-0.169***	-0.203***
		(-5.741)	(-4.995)							(-2.624)	(-2.773)	(-2.773)	(-3.966)	(-4.564)
ln Index Weight							-0.137***	-0.124***	-0.123***	-0.0801**	-0.0827**	-0.0827**	-0.0839***	
							(-4.682)	(-3.257)	(-3.205)	(-1.961)	(-1.979)	(-1.979)	(-2.741)	
ln Analyst coverage				-0.0131				-0.0314	-0.0298		-0.0365*	-0.0365*		-0.0167
				(-1.171)				(-1.639)	(-1.495)		(-1.854)	(-1.854)		(-1.550)
Consensus					-0.0231				-0.0208	-0.0208	-0.0198	-0.0198		
					(-1.463)				(-1.339)	(-1.279)	(-1.255)	(-1.255)		
Strong buy						-0.0547		-0.0322						
						(-1.061)		(-0.692)						
Buy						-0.0372		-0.0109						
						(-0.767)		(-0.259)						
Hold						-0.0227		-0.00570						
						(-0.475)		(-0.139)						
Sell						-0.00275		0.0106						
						(-0.0954)		(0.398)						
Constant	-0.0971**	-0.675***	0.161***	0.0180**	-0.208***	-0.227***	0.109***	-0.294***	-0.217***	-0.446***	-0.191	-0.191	-0.947***	0.0834***
	(-2.555)	(-16.98)	(3.018)	(2.303)	(-8.816)	(-3.715)	(6.240)	(-6.019)	(-2.867)	(-3.163)	(-1.463)	(-1.463)	(-10.11)	(2.783)
Companies	104	107	103	90	99	89	109	87	87	88	86	86	107	89
Observations	3,523	3,938	3,456	3,020	2,344	2,344	4,027	2,310	2,310	2,310	2,278	2,278	3,938	2,966
R-squared	0.680	0.733	0.745	0.644	0.634	0.633	0.719	0.682	0.683	0.691	0.705	0.705	0.747	0.696

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix B: Using different dummies and clusters

Regressions with different dummies

VARIABLES	(1) F&T	(2) F	(3) T	(4) ND
ln Index Weight	-0.106***	-0.0996***	0.0233**	0.0248***
	(-4.518)	(-4.299)	(2.454)	(2.599)
ln P/B	-0.181***	-0.196***	-0.00695	-0.0132
	(-7.376)	(-8.220)	(-0.520)	(-0.963)
Constant	0.0751	-0.630***	-0.0400***	0.0445**
	(1.200)	(-10.39)	(-3.379)	(2.294)
Observations	8,594	8,594	8,594	8,594
R-squared	0.771	0.720	0.124	0.018

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regressions are performed the whole data sample, using 3 years holding periods, and double clustered standard errors.

The regressions in the table above show the estimators and standard errors when different dummies are included. The regressions are performed on the complete data sample, using 3 years holding periods, and standard errors are clustered by firm and time.

Regression (1) includes firm and time dummies, thus takes both time and firm fixed effect into account. Regression (2) includes firm dummies only, thus accounting for firm fixed effects. Regression (3) includes time dummies only, thus takes into account time fixed effects. The final regression does not include any dummies, thus ignores all kinds of fixed effects.

As observed, controlling for both firm and time fixed effects, gives the most significant result for index weight. The index weight coefficient also shows the strongest effect on returns. We also observe that controlling for firm fixed effects has the strongest impact on our results. When firm effects are not included, we get an opposite sign for index weight.

The choice of dummies also affects the results for P/B. Similar to index weight, we observe that controlling for firm fixed effects has the strongest impact. Controlling for both firm and time fixed effects, gives less significant results than controlling for firm fixed effects only. However, the difference is small, thus seems negligible. When firm effects are not included, we do not get any significant results.

Regressions using different clusters

VARIABLES	(1) 2C	(2) TE	(3) FE	(4) NC
ln Index Weight	-0.106***	-0.106***	-0.106***	-0.106***
	(0.0234)	(0.0234)	(0.00596)	(0.00407)
ln P/B	-0.181***	-0.181***	-0.181***	-0.181***
	(0.0246)	(0.0241)	(0.00916)	(0.00488)
Constant	0.0751	0.0751	0.0751***	0.0751
	(0.0626)	(0.0638)	(0.0172)	(0.100)
Observations	8,594	8,594	8,594	8,594
R-squared	0.771	0.771	0.771	0.771

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The clustering method will only affect standard errors in our model. To show the effect of the different clusters we have included the table above. Regression (1) is our usual double-clustered model, regression (2) is only clustered by firms (time effect), regression (3) is clustered by time (firm effect) and regression (4) does not correct for any clusters.

The largest change in standard errors compared to no clustering is observed when we correct for firm effects. This is expected as the self-inflicted serial correlation will lead to underestimated standard errors.

Appendix C: Bloomberg codes

This table shows the Bloomberg codes related to the variables in our data set.

Name	Bloomberg code
Last price	PR005, PX_LAST
Dividends per share	IS151, IS_DIV_PER_SHR
Trailing EPS before XO items	RR819, Trail_12M_EPS_BEF_XO_ITEM
Basic EPS Before XO items	IS064, IS_EARN_BEF_XO_ITEMS_PER_SH
Book value	RR020, BOOK_VAL_PER_SH

Appendix D: Companies

This table lists all companies included in the MSCI index from August 2008 until August 2015.

Name	Sector	Country	Region	Bloomberg ticker
A'ayan Leasing & Investment Co KSCP	Financials	Kuwait	Middle East	AAYAN KK Equity
Aabar Investments PJSC	Energy	United Arab Emirates	Middle East	AABAR DH Equity
AB Bank Ltd	Financials	Bangladesh	Asia	ABBANK BD Equity
Abu Dhabi Commercial Bank PJSC	Financials	United Arab Emirates	Middle East	ADCB DH Equity
Abu Dhabi National Hotels	Consumer Discretionary	United Arab Emirates	Middle East	ADNH DH Equity
Access Bank PLC	Financials	Nigeria	Africa	ACCESS NL Equity
Adris Grupa DD	Consumer Staples	Croatia	Europe & CIS	ADRSPA ZA Equity
Aerodrom Nikola Tesla AD Beograd	Industrials	Serbia	Europe & CIS	AERO SG Equity
Agility Public Warehousing Co KSC	Industrials	Kuwait	Middle East	AGLTY KK Equity
Ahli Bank SAOG	Financials	Oman	Middle East	ABOB OM Equity
Ahli United Bank KSCP	Financials	Kuwait	Middle East	AUB KK Equity
AIK Banka AD	Financials	Serbia	Europe & CIS	AIKB SG Equity
Air Arabia PJSC	Industrials	United Arab Emirates	Middle East	AIRARABI DB Equity
Aitken Spence PLC	Industrials	Sri Lanka	Asia	SPEN SL Equity
Al Ahli Bank of Kuwait KSCP	Financials	Kuwait	Middle East	ABK KK Equity
Al Baraka Banking Group BSC	Financials	Bahrain	Middle East	BARKA BI Equity
Al Khalij Commercial Bank PQSC	Financials	Qatar	Middle East	KCBK QD Equity
Al Salam Bank-Bahrain BSC	Financials	Bahrain	Middle East	SALAM BI Equity
Al-Arafah Islami Bank Ltd	Financials	Bangladesh	Asia	ALARAB BD Equity
Aldar Properties PJSC	Financials	United Arab Emirates	Middle East	ALDAR DH Equity
Alia The Royal Jordanian Airlines PLC	Industrials	Jordan	Middle East	RJAL JR Equity
Aluminium Bahrain BSC	Materials	Bahrain	Middle East	ALBH BI Equity
Amlak Finance PJSC	Financials	United Arab Emirates	Middle East	AMLAK DB Equity
Apranga PVA	Consumer Discretionary	Lithuania	Europe & CIS	APG1L LH Equity
Arab Bank PLC	Financials	Jordan	Middle East	ARBK JR Equity
Arab Potash/The	Materials	Jordan	Middle East	APOT JR Equity
Arab Real Estate Development	Financials	Jordan	Middle East	ARED JR Equity
Arab Tunisian Bank	Financials	Tunisia	Africa	ATB TU Equity
Arabtec Holding PJSC	Industrials	United Arab Emirates	Middle East	ARTC DB Equity
Aref Investment Group Co KSCC	Financials	Kuwait	Middle East	AIG KK Equity
AS Tallinna Vesi	Utilities	Estonia	Europe & CIS	TVEAT ET Equity
Atlantic Grupa	Consumer Staples	Croatia	Europe & CIS	ATGRRA ZA Equity
Atlantska Plovidba DD	Industrials	Croatia	Europe & CIS	ATPLRA ZA Equity
Attijariwafa Bank	Financials	Morocco	Africa	ATW MC Equity
Azovstal Iron & Steel Works PJSC	Materials	Ukraine	Europe & CIS	AZST UZ Equity
Bahrain Islamic Bank BSC	Financials	Bahrain	Middle East	BISB BI Equity
Bahrain Telecommunications Co BSC	Telecommunication Services	Bahrain	Middle East	BATELCO BI Equity
Bamburi Cement Co Ltd	Materials	Kenya	Africa	BMBC KN Equity
Banca Transilvania SA	Financials	Romania	Europe & CIS	TLV RE Equity
Banco Macro SA	Financials	Argentina	Americas	BMA UN Equity
Bangladesh Export Import Co Ltd	Industrials	Bangladesh	Asia	BEXIMC BD Equity
Bank Audi SAL	Financials	Lebanon	Middle East	AUDI LB Equity
Bank Dhofar SAOG	Financials	Oman	Middle East	BKDB OM Equity
Bank for Foreign Trade of Vietnam JSC	Financials	Vietnam	Asia	VCB VM Equity
Bank for Investment and Development of Vietnam	Financials	Vietnam	Asia	BID VM Equity
Bank Muscat SAOG	Financials	Oman	Middle East	BKMB OM Equity
Bank of Beirut	Financials	Lebanon	Middle East	BOB LB Equity
Bank of Sharjah	Financials	United Arab Emirates	Middle East	BOS DH Equity
Bank PHB PLC	Financials	Nigeria	Africa	PLATINUM NL Equity
Bank Sohar SAOG	Financials	Oman	Middle East	BKSB OM Equity

Name	Sector	Country	Region	Bloomberg ticker
Banque Centrale Populaire	Financials	Morocco	Africa	BCP MC Equity
Banque de l'Habitat	Financials	Tunisia	Africa	BH TU Equity
Banque de Tunisie	Financials	Tunisia	Africa	BT TU Equity
Banque Internationale Arabe de Tunisie	Financials	Tunisia	Africa	BIAT TU Equity
Bao Viet Holdings	Financials	Vietnam	Asia	BVH VM Equity
Barclays Bank of Kenya Ltd	Financials	Kenya	Africa	BCBL KN Equity
Barwa Real Estate Co	Financials	Qatar	Middle East	BRES QD Equity
BBK BSC	Financials	Bahrain	Middle East	BBK BI Equity
BBVA Banco Frances SA	Financials	Argentina	Americas	BFR UN Equity
Benue Cement Co PLC	Materials	Nigeria	Africa	BCC NL Equity
Beximco Pharmaceuticals Ltd	Health Care	Bangladesh	Asia	BXPHAR BD Equity
BEXTEX Ltd	Consumer Discretionary	Bangladesh	Asia	BEXTEX BD Equity
BLOM Bank SAL	Financials	Lebanon	Middle East	BLOM LB Equity
BMCE Bank	Financials	Morocco	Africa	BCE MC Equity
Boubyan Bank KSCP	Financials	Kuwait	Middle East	BOUBYAN KK Equity
Boubyan Petrochemicals Co KSCP	Materials	Kuwait	Middle East	BPCC KK Equity
BRD-Groupe Societe Generale SA	Financials	Romania	Europe & CIS	BRD RE Equity
British American Tobacco Bangladesh Co L	Consumer Staples	Bangladesh	Asia	BATBC BD Equity
BSRM Steels Ltd	Materials	Bangladesh	Asia	BSRM BD Equity
Bukit Darah PLC/The	Consumer Staples	Sri Lanka	Asia	BUKI SL Equity
Bulgarian American Credit Bank JSCO	Financials	Bulgaria	Europe & CIS	5BN BU Equity
Bulgarian Telecommunications Co EAD	Telecommunication Services	Bulgaria	Europe & CIS	5BT BU Equity
Burgan Bank SAK	Financials	Kuwait	Middle East	BURG KK Equity
Byblos Bank SAL	Financials	Lebanon	Middle East	BYB LB Equity
Cairo Amman Bank	Financials	Jordan	Middle East	CABK JR Equity
Capital Bank of Jordan	Financials	Jordan	Middle East	EXFB JR Equity
CB First Investment Bank AD	Financials	Bulgaria	Europe & CIS	5F4 BU Equity
Centrenergo PJSC	Utilities	Ukraine	Europe & CIS	CEEN UK Equity
Ceylon Tobacco Co PLC	Consumer Staples	Sri Lanka	Asia	CTC SL Equity
Chimimport AD	Industrials	Bulgaria	Europe & CIS	6C4 BU Equity
Cie Generale Immobiliere	Financials	Morocco	Africa	CGI MC Equity
Ciments du Maroc	Materials	Morocco	Africa	CMA MC Equity
City Bank Ltd/The	Financials	Bangladesh	Asia	CITYBA BD Equity
Co-operative Bank of Kenya Ltd/The	Financials	Kenya	Africa	COOP KN Equity
Commercial Bank of Ceylon PLC	Financials	Sri Lanka	Asia	COMB SL Equity
Commercial Bank of Kuwait KPSC	Financials	Kuwait	Middle East	CBK KK Equity
Commercial Bank QSC/The	Financials	Qatar	Middle East	CBQK QD Equity
Commercial Facilities Co SAKP	Financials	Kuwait	Middle East	FACIL KK Equity
Commercial Real Estate Co KSC	Financials	Kuwait	Middle East	ALTIJARI KK Equity
Cresud SACIF y A	Financials	Argentina	Americas	CRESY UW Equity
Dalekovod DD	Industrials	Croatia	Europe & CIS	DLKVRA ZA Equity
Dana Gas PJSC	Energy	United Arab Emirates	Middle East	DANA DH Equity
Dangote Cement PLC	Materials	Nigeria	Africa	DANGCEM NL Equity
Dangote Sugar Refinery PLC	Consumer Staples	Nigeria	Africa	DANGSUGA NL Equity
DFCC Bank PLC	Financials	Sri Lanka	Asia	DFCC SL Equity
Dhaka Electric Supply Co Ltd	Utilities	Bangladesh	Asia	DESC BD Equity
Dhofar International Development & Inves	Financials	Oman	Middle East	DIDI OM Equity
Dialog Axiata PLC	Telecommunication Services	Sri Lanka	Asia	DIAL SL Equity
Diamond Bank PLC	Financials	Nigeria	Africa	DIAMONDB NL Equity
Distilleries Co of Sri Lanka PLC	Consumer Staples	Sri Lanka	Asia	DIST SL Equity
Doha Bank QSC	Financials	Qatar	Middle East	DHBK QD Equity
Douja Promotion Groupe Addoha SA	Financials	Morocco	Africa	ADH MC Equity
DP World Ltd	Industrials	United Arab Emirates	Middle East	DPW DU Equity
DTEK Zakhidenergo PJSC	Utilities	Ukraine	Europe & CIS	ZAEN UZ Equity
Dubai Financial Market PJSC	Others	United Arab Emirates	Middle East	DFM DB Equity
Dubai Investments PJSC	Financials	United Arab Emirates	Middle East	DIC DB Equity
Dubai Islamic Bank PJSC	Financials	United Arab Emirates	Middle East	DIB DB Equity
Dutch-Bangla Bank Ltd	Financials	Bangladesh	Asia	DUBA BD Equity
DZI Insurance PLC	Financials	Bulgaria	Europe & CIS	6D5 BU Equity
East African Breweries Ltd	Consumer Staples	Kenya	Africa	EABL KN Equity

Name	Sector	Country	Region	Bloomberg ticker
Ecobank Nigeria Ltd	Financials	Nigeria	Africa	ECOBANK NL Equity
Ecobank Transnational Inc	Financials	Nigeria	Africa	ETI NL Equity
Electrica SA	Utilities	Romania	Europe & CIS	EL RE Equity
Emaar Properties PJSC	Others	United Arab Emirates	Middle East	EMAAR DB Equity
Emirates NBD PJSC	Financials	United Arab Emirates	Middle East	EMIRATES DB Equity
Engro Corp Ltd/Pakistan	Materials	Pakistan	Asia	ENGRO PK Equity
Equity Group Holdings Ltd/Kenya	Financials	Kenya	Africa	EQBNK KN Equity
Ericsson Nikola Tesla dd	Information Technology	Croatia	Europe & CIS	ERNTRA ZA Equity
Erste & Steiermarkische Banka DD	Financials	Croatia	Europe & CIS	RIBARA ZA Equity
Export Import Bank of Bangladesh Ltd	Financials	Bangladesh	Asia	EXIM BD Equity
Fatima Fertilizer Co Ltd	Materials	Pakistan	Asia	FATIMA PK Equity
Fauji Fertilizer Co Ltd	Materials	Pakistan	Asia	FFC PK Equity
FBN Holdings Plc	Financials	Nigeria	Africa	FBNH NL Equity
FCMB Group Plc	Financials	Nigeria	Africa	FCMB NL Equity
Ferrexpo Poltava Mining OJSC	Materials	Ukraine	Europe & CIS	PGOK UZ Equity
Fidelity Bank PLC	Financials	Nigeria	Africa	FIDELITY NL Equity
First Gulf Bank PJSC	Financials	United Arab Emirates	Middle East	FGB DH Equity
First Investment Co KSCP	Financials	Kuwait	Middle East	ALOLA KK Equity
Flour Mills of Nigeria PLC	Consumer Staples	Nigeria	Africa	FLOURMIL NL Equity
Forte Oil PLC	Energy	Nigeria	Africa	FO NL Equity
FPT Corp	Information Technology	Vietnam	Asia	FPT VM Equity
Galfar Engineering & Contracting SAOG	Industrials	Oman	Middle East	GECS OM Equity
GFH FINANCIAL GROUP BSC	Financials	Bahrain	Middle East	GFH BI Equity
Global Investment House KPSC	Financials	Kuwait	Middle East	GLOBAL KK Equity
Gorenje dd	Consumer Discretionary	Slovenia	Europe & CIS	GRVG SV Equity
GrameenPhone Ltd	Telecommunication Services	Bangladesh	Asia	GRAM BD Equity
Grupo Financiero Galicia SA	Financials	Argentina	Americas	GGAL UR Equity
Guaranty Trust Bank PLC	Financials	Nigeria	Africa	GUARANTY NL Equity
Guinness Nigeria PLC	Consumer Staples	Nigeria	Africa	GUINNESS NL Equity
Gulf Bank KSCP	Financials	Kuwait	Middle East	GBK KK Equity
Gulf Cable & Electrical Industries Co KS	Industrials	Kuwait	Middle East	CABLE KK Equity
Gulf Cement Co PSC	Materials	United Arab Emirates	Middle East	GCEM DH Equity
Gulf General Investment Co	Financials	United Arab Emirates	Middle East	GGICO DB Equity
Habib Bank Ltd	Financials	Pakistan	Asia	HBL PK Equity
HAGL JSC (ny ticker i feb 2016??)	Financials	Vietnam	Asia	HAG VM Equity
Halyk Savings Bank of Kazakhstan JSC	Financials	Kazakhstan	Europe & CIS	HSBK KZ Equity
Hatton National Bank PLC	Financials	Sri Lanka	Asia	HNBNV SL Equity
Hoa Phat Group JSC	Materials	Vietnam	Asia	HPG VM Equity
Hrvatski Telekom dd	Telecommunication Services	Croatia	Europe & CIS	HTRA ZA Equity
HSBC Bank Oman SAOG	Financials	Oman	Middle East	HBMO OM Equity
Hub Power Co Ltd/The	Utilities	Pakistan	Asia	HUBC PK Equity
IFA Hotels & Resorts-KPSC	Consumer Discretionary	Kuwait	Middle East	IFAHR KK Equity
INA Industrija Nafte DD	Energy	Croatia	Europe & CIS	INARA ZA Equity
Indus Motor Co Ltd	Consumer Discretionary	Pakistan	Asia	INDU PK Equity
Industries Qatar QSC	Industrials	Qatar	Middle East	IQCD QD Equity
Institut IGH DD	Industrials	Croatia	Europe & CIS	IGHRA ZA Equity
Intercontinental Bank PLC	Financials	Nigeria	Africa	INTERCON NL Equity
International Financial Advisors KSC	Financials	Kuwait	Middle East	IFA KK Equity
Interpipe Nizhnedneprovsky Tube Rolling	Materials	Ukraine	Europe & CIS	NITR UZ Equity
Invalda LT AB	Financials	Lithuania	Europe & CIS	IVL1L LH Equity
Investcorp Bank BSC	Financials	Bahrain	Middle East	INVCORP BI Equity
Investment Corp of Bangladesh	Financials	Bangladesh	Asia	ICB BD Equity
Investment Dar Co KSC	Financials	Kuwait	Middle East	TID KK Equity
IRSA Inversiones y Representaciones SA	Financials	Argentina	Americas	IRS UN Equity
Islami Bank Bangladesh Ltd	Financials	Bangladesh	Asia	ISLAMI BD Equity
Istrabenz DD	Financials	Slovenia	Europe & CIS	ITBG SV Equity
Ithmaar Bank BSC	Financials	Bahrain	Middle East	ITHMR BI Equity
Jahangir Siddiqui & Co Ltd	Financials	Pakistan	Asia	JSCL PK Equity
John Keells Holdings PLC	Industrials	Sri Lanka	Asia	JKH SL Equity
Jordan Ahli Bank	Financials	Jordan	Middle East	AHLI JR Equity

Name	Sector	Country	Region	Bloomberg ticker
Jordan Islamic Bank	Financials	Jordan	Middle East	JOIB JR Equity
Jordan Petroleum Refinery Co	Energy	Jordan	Middle East	JOPT JR Equity
Jordan Phosphate Mines	Materials	Jordan	Middle East	JOPH JR Equity
Jordan Telecommunications Co PSC	Telecommunication Services	Jordan	Middle East	JTEL JR Equity
Jordanian Electric Power Co	Utilities	Jordan	Middle East	JOEP JR Equity
K-Electric Ltd	Utilities	Pakistan	Asia	KEL PK Equity
Kazkommertsbank JSC	Financials	Kazakhstan	Europe & CIS	KKGB KZ Equity
KazMunaiGas Exploration Production JSC	Energy	Kazakhstan	Europe & CIS	RDGZ KZ Equity
KCB Group Ltd	Financials	Kenya	Africa	KNCB KN Equity
KCell JSC	Telecommunication Services	Kazakhstan	Europe & CIS	KCEL LI Equity
Kenya Electricity Generating Co Ltd	Others	Kenya	Africa	KEGC KN Equity
Khaleeji Commercial Bank BSC	Financials	Bahrain	Middle East	KHCB BI Equity
Khulna Power Co Ltd	Utilities	Bangladesh	Asia	KPCL BD Equity
KIDO Group Corp	Consumer Staples	Vietnam	Asia	KDC VM Equity
Kinh Bac City Development Share Holding	Financials	Vietnam	Asia	KBC VH Equity
Klaipedos Nafta AB	Energy	Lithuania	Europe & CIS	KNF1L LH Equity
Komercijalna Banka AD Beograd	Financials	Serbia	Europe & CIS	KMBN SG Equity
Kot Addu Power Co Ltd	Utilities	Pakistan	Asia	KAPCO PK Equity
Krka dd Novo mesto	Health Care	Slovenia	Europe & CIS	KRKG SV Equity
Kuwait Cement Co KSC	Materials	Kuwait	Middle East	KCEM KK Equity
Kuwait Finance House KSCP	Financials	Kuwait	Middle East	KFIN KK Equity
Kuwait Food Co Americana SAK	Consumer Discretionary	Kuwait	Middle East	FOOD KK Equity
Kuwait International Bank KSCP	Financials	Kuwait	Middle East	KIB KK Equity
Kuwait Projects Co Holding KSCP	Financials	Kuwait	Middle East	KPROJ KK Equity
Lafarge Africa PLC	Materials	Nigeria	Africa	WAPCO NL Equity
Lafarge Jordan Cement	Materials	Jordan	Middle East	JOCM JR Equity
Lafarge Surma Cement Ltd	Materials	Bangladesh	Asia	LAFCEM BD Equity
LafargeHolcim Maroc SA	Materials	Morocco	Africa	LHM MC Equity
Ledo dd	Consumer Staples	Croatia	Europe & CIS	LEDORA ZA Equity
Lesto AB	Utilities	Lithuania	Europe & CIS	LES1L LH Equity
Lucky Cement Ltd	Materials	Pakistan	Asia	LUCK PK Equity
Luka Koper	Industrials	Slovenia	Europe & CIS	LKPG SV Equity
Mabanee Co SAK	Financials	Kuwait	Middle East	MABANEE KK Equity
Mainstreet Bank Ltd	Financials	Nigeria	Africa	AFRIBANK NL Equity
Managem	Materials	Morocco	Africa	MNG MC Equity
Mariupolsky Metallurgical Zavod of Illic	Materials	Ukraine	Europe & CIS	MMKI UZ Equity
Maroc Telecom	Telecommunication Services	Morocco	Africa	IAM MC Equity
Masan Group Corp	Consumer Staples	Vietnam	Asia	MSN VM Equity
Masraf Al Rayan QSC	Financials	Qatar	Middle East	MARK QD Equity
Massy Holdings Ltd	Industrials	Trinidad & Tobago	Americas	MASSY TP Equity
Mauritius Commercial Bank Ltd/The	Financials	Morocco	Africa	MCB MP Equity
MCB Bank Ltd	Financials	Pakistan	Asia	MCB PK Equity
MCB Group Ltd	Financials	Morocco	Africa	MCBG MP Equity
Mercator Poslovni Sistem	Consumer Staples	Slovenia	Europe & CIS	MELR SV Equity
Middle East Complex for Engineering Elec	Consumer Discretionary	Jordan	Middle East	MECE JR Equity
Mobile Telecommunications Co KSC	Telecommunication Services	Kuwait	Middle East	ZAIN KK Equity
Motor Sich PJSC	Industrials	Ukraine	Europe & CIS	MSICH UK Equity
National Bank Ltd	Financials	Bangladesh	Asia	NBL BD Equity
National Bank of Abu Dhabi PJSC	Financials	United Arab Emirates	Middle East	NBAD DH Equity
National Bank of Kuwait SAKP	Financials	Kuwait	Middle East	NBK KK Equity
National Bank of Oman SAOG	Financials	Oman	Middle East	NBOB OM Equity
National Bank of Pakistan	Financials	Pakistan	Asia	NBP PK Equity
National Industries Group Holding SAK	Industrials	Kuwait	Middle East	NIND KK Equity
National Investments Co KSCP	Financials	Kuwait	Middle East	NINV KK Equity
National Mobile Telecommunications Co KS	Telecommunication Services	Kuwait	Middle East	OOREDOO KK Equity
National Real Estate Co KPSC	Financials	Kuwait	Middle East	NRE KK Equity
Nestle Nigeria PLC	Consumer Staples	Nigeria	Africa	NESTLE NL Equity
New Mauritius Hotels Ltd	Consumer Discretionary	Morocco	Africa	NMH MP Equity
Nigerian Breweries PLC	Consumer Staples	Nigeria	Africa	NB NL Equity
NIS AD Novi Sad	Energy	Serbia	Europe & CIS	NIIS SG Equity

Name	Sector	Country	Region	Bloomberg ticker
Oceanic Bank International PLC	Financials	Nigeria	Africa	OCEANIC NL Equity
Oil & Gas Development Co Ltd	Energy	Pakistan	Asia	OGDC PK Equity
Olympic Entertainment Group AS	Consumer Discretionary	Estonia	Europe & CIS	OEG1T ET Equity
Oman Cables Industry	Industrials	Oman	Middle East	OCAI OM Equity
Oman Cement Co SAOG	Materials	Oman	Middle East	OCOI OM Equity
Oman Telecommunications Co SAOG	Telecommunication Services	Oman	Middle East	OTEL OM Equity
OMV Petrom SA	Energy	Romania	Europe & CIS	SNP RE Equity
Ooredoo	Telecommunication Services	Oman	Middle East	ORDS OM Equity
Ooredoo QSC	Telecommunication Services	Qatar	Middle East	ORDS QD Equity
Padma Oil Co Ltd	Energy	Bangladesh	Asia	PADMAO BD Equity
Pakistan Oilfields Ltd	Energy	Pakistan	Asia	POL PK Equity
Pakistan Petroleum Ltd	Energy	Pakistan	Asia	PPL PK Equity
Pakistan State Oil Co Ltd	Energy	Pakistan	Asia	PSO PK Equity
Pakistan Telecommunication Co Ltd	Telecommunication Services	Pakistan	Asia	PTC PK Equity
Pakistan Tobacco Co Ltd	Consumer Staples	Pakistan	Asia	PAKT PK Equity
Petrobras Argentina SA	Energy	Argentina	Americas	PZE UN Equity
Petrobras Energia Participaciones SA	Energy	Argentina	Americas	3407942Q UN Equity
Petrol DD Ljubljana	Consumer Discretionary	Slovenia	Europe & CIS	PETG SV Equity
PetroVietnam Drilling & Well Services JS	Energy	Vietnam	Asia	PVD VM Equity
Petrovietnam Fertilizer & Chemicals JSC	Materials	Vietnam	Asia	DPM VM Equity
PetroVietnam Finance JSC	Financials	Vietnam	Asia	PVF VM Equity
PetroVietnam Gas JSC	Utilities	Vietnam	Asia	GAS VM Equity
Pha Lai Thermal Power JSC	Utilities	Vietnam	Asia	PPC VM Equity
Podravka Prehrambena Ind DD	Consumer Staples	Croatia	Europe & CIS	PODRRA ZA Equity
Pokrovske Mine Management PJSC	Energy	Ukraine	Europe & CIS	SHCHZ UZ Equity
Poulina Group	Industrials	Tunisia	Africa	PGH TU Equity
Power Grid Co of Bangladesh Ltd	Utilities	Bangladesh	Asia	POWERGRI BD Equity
Prime Bank Ltd	Financials	Bangladesh	Asia	PB BD Equity
Prime Finance & Investment Ltd	Financials	Bangladesh	Asia	PRIMEFIN BD Equity
Privredna Banka Zagreb dd	Financials	Croatia	Europe & CIS	PBZRA ZA Equity
Pubali Bank Ltd	Financials	Bangladesh	Asia	PUBALI BD Equity
PZ Cussons Nigeria PLC	Consumer Staples	Nigeria	Africa	PZ NL Equity
Qatar Electricity & Water Co QSC	Utilities	Qatar	Middle East	QEWS QD Equity
Qatar Gas Transport Co Ltd	Energy	Qatar	Middle East	QGTS QD Equity
Qatar Insurance Co SAQ	Financials	Qatar	Middle East	QATI QD Equity
Qatar International Islamic Bank QSC	Financials	Qatar	Middle East	QIIK QD Equity
Qatar Islamic Bank SAQ	Financials	Qatar	Middle East	QIBK QD Equity
Qatar National Bank SAQ	Financials	Qatar	Middle East	QNBK QD Equity
Qatar Navigation QSC	Industrials	Qatar	Middle East	QNNS QD Equity
Qatar Shipping Co SPC	Industrials	Qatar	Middle East	QSHS QD Equity
Qurain Petrochemical Industries Co KSC	Materials	Kuwait	Middle East	ALQURAIN KK Equity
Raiffeisen Bank Aval JSC	Financials	Ukraine	Europe & CIS	BAVL UK Equity
Raysut Cement Co SAOG	Materials	Oman	Middle East	RCCI OM Equity
Renaissance Services SAOG	Energy	Oman	Middle East	RNSS OM Equity
Republic Bank Ltd	Financials	Trinidad & Tobago	Americas	RBL TP Equity
ROMGAZ SA	Energy	Romania	Europe & CIS	SNG RE Equity
Rytu Skirstomieji Tinklai	Others	Lithuania	Europe & CIS	RST1L LH Equity
Safaricom Ltd	Telecommunication Services	Kenya	Africa	SAFCOM KN Equity
Saigon Securities Inc	Financials	Vietnam	Asia	SSI VM Equity
Saigon Thuong Tin Commercial JSB	Financials	Vietnam	Asia	STB VM Equity
Salalah Port Services Co SAOG	Industrials	Oman	Middle East	SPSI OM Equity
Sava DD	Consumer Discretionary	Slovenia	Europe & CIS	SAVA SV Equity
SBM Bank Mauritius Ltd	Financials	Morocco	Africa	SBM MP Equity
Securities House KSC/The	Financials	Kuwait	Middle East	SECH KK Equity
SEPLAT Petroleum Development Co Plc	Energy	Nigeria	Africa	SEPLAT NL Equity
SFBT	Consumer Staples	Tunisia	Africa	SFBT TU Equity
Shell Oman Marketing Co SAOG	Energy	Oman	Middle East	SOMS OM Equity
Solidere	Others	Lebanon	Middle East	SOLA LB Equity
Solidere	Others	Lebanon	Middle East	SOLB LB Equity
Sopharma AD/Sofia	Health Care	Bulgaria	Europe & CIS	3JR BU Equity

Name	Sector	Country	Region	Bloomberg ticker
Sorouh Real Estate Co	Financials	United Arab Emirates	Middle East	SOROUH DH Equity
South Ore Mining & Processing Plant	Materials	Ukraine	Europe & CIS	PGZK UZ Equity
Square Pharmaceuticals Ltd	Health Care	Bangladesh	Asia	SQUARE BD Equity
Sri Lanka Telecom PLC	Telecommunication Services	Sri Lanka	Asia	SLTL SL Equity
Stanbic IBTC Holdings PLC	Financials	Nigeria	Africa	STANBIC NL Equity
Standard Chartered Bank Kenya Ltd	Financials	Kenya	Africa	SCBL KN Equity
Sultan Center Food Products Co KSC	Consumer Staples	Kuwait	Middle East	SULTAN KK Equity
Summit Power Ltd	Utilities	Bangladesh	Asia	SUMITPOW BD Equity
Taameer Jordan Holdings PSC	Financials	Jordan	Middle East	TAMR JR Equity
Tallink Grupp AS	Industrials	Estonia	Europe & CIS	TAL1T ET Equity
Tallinna Kaubamaja Grupp AS	Consumer Staples	Estonia	Europe & CIS	TKM1T ET Equity
Tamweel PSC	Financials	United Arab Emirates	Middle East	TAMWEEL DB Equity
Tankerska Plovidba DD	Industrials	Croatia	Europe & CIS	TNPLRA ZA Equity
Telecom Argentina SA	Telecommunication Services	Argentina	Americas	TEO UN Equity
Telekom Slovenije DD	Telecommunication Services	Slovenia	Europe & CIS	TLSG SV Equity
Telia Eesti AS	Telecommunication Services	Estonia	Europe & CIS	ETLAT ET Equity
TEO LT AB	Telecommunication Services	Lithuania	Europe & CIS	TEO1L LH Equity
Titas Gas Transmission & Distribution Co	Energy	Bangladesh	Asia	TITASGAS BD Equity
Transelectrica SA	Utilities	Romania	Europe & CIS	TEL RE Equity
Transgaz SA Medias	Energy	Romania	Europe & CIS	TGN RE Equity
Ukio Bankas	Financials	Lithuania	Europe & CIS	UKB1L LH Equity
Ukrnafta PJSC	Energy	Ukraine	Europe & CIS	UNAF UZ Equity
Ukrsotsbank PJSC	Financials	Ukraine	Europe & CIS	USCB UK Equity
UkrTelecom PJSC	Telecommunication Services	Ukraine	Europe & CIS	UTLM UZ Equity
Unilever Nigeria PLC	Consumer Staples	Nigeria	Africa	UNILEVER NL Equity
Union Bank of Nigeria PLC	Financials	Nigeria	Africa	UBN NL Equity
Union National Bank PJSC	Financials	United Arab Emirates	Middle East	UNB DH Equity
Union Properties PJSC	Financials	United Arab Emirates	Middle East	UPP DB Equity
Unique Hotel & Resorts Ltd	Consumer Discretionary	Bangladesh	Asia	UHRL BD Equity
United Arab Investors	Financials	Jordan	Middle East	UAIC JR Equity
United Bank for Africa PLC	Financials	Nigeria	Africa	UBA NL Equity
United Bank Ltd/Pakistan	Financials	Pakistan	Asia	UBL PK Equity
United Commercial Bank Ltd	Financials	Bangladesh	Asia	UCB BD Equity
United Gulf Bank BSC	Financials	Bahrain	Middle East	UGB BI Equity
VietinBank	Financials	Vietnam	Asia	CTG VM Equity
Vietnam Dairy Products JSC	Consumer Staples	Vietnam	Asia	VNM VM Equity
Vinaconex Corp	Industrials	Vietnam	Asia	VCG VH Equity
Vingroup JSC	Financials	Vietnam	Asia	VIC VM Equity
Vodafone Qatar QSC	Telecommunication Services	Qatar	Middle East	VFQS QD Equity
Wafa Assurance	Financials	Morocco	Africa	WAA MC Equity
YPF SA	Energy	Argentina	Americas	YPF UN Equity
Zagrebacka Banka dd	Financials	Croatia	Europe & CIS	ZABARA ZA Equity
Zavarovalnica Triglav DD	Financials	Slovenia	Europe & CIS	ZVTG SV Equity
Zenith Bank PLC	Financials	Nigeria	Africa	ZENITHBA NL Equity

Appendix E: List of figures