EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 4, Issue 2, 2018
ISSN 2336-6494
www.ejobsat.cz

EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 4, Issue 2
2018

Mendel University in Brno
www.ejobsat.com

EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Editorial Office Address
EJOBSAT, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic

Registration number MK ČR E22009
The journal is published twice a year.
Typesetting Pavel Haluza, Jiří Rybička
First edition
Number of printed copies 100
ISSN 2336-6494

Number 2, 2018 was published on December 28, 2018 by Mendel University Press

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DOES THE FEDERAL CONSTITUTIONAL COURT RULING MEAN THE GERMAN FINANCIAL MARKET IS EFFICIENT?

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ABSTRACT

Following the landmark ruling by the German Federal Constitutional Court in Karlsruhe on 7th February 2014 in which they endorsed the efficient market hypothesis, we present evidence on the efficiency of the German financial market. Introducing a new variance bound test based on the Component-GARCH model of volatility to analyse the long- and short-runs effects on the efficiency of the German financial market, we test the price volatility of four markets: DAX stock index, German sovereign debt index as provided by Barclays and Bloomberg, Euro gold index by the World Gold Council and Euro currency index by the Bank of England. Our use of the Component-GARCH-T model highlight two key contributions, the first being the analysis of the efficiency of the market in the long and short runs. However, a more important contribution is the result of our variance bound test highlight the relatively strong acceptance of the efficient market hypothesis in both the short and long runs in all the observed financial markets. It must be stated our research is of importance to researches in both applied finance and portfolio management. The influencing question of what moves specific markets is crucial to market participants seeking market alpha for their investments strategies and portfolio optimisations.

KEY WORDS

EMH, volatility tests, C-GARCH-T, financial markets, gold market

JEL CODES

B13, B21, C12, G14, G15, H63

FAKHRY, Bachar, and RICHTER, Christian. 2018. Does the Federal Constitutional Court Ruling Mean the German Financial Market is Efficient?. *European Journal of Business Science and Technology*, 4 (2): 111–125. ISSN 2336-6494, DOI http://dx.doi.org/10.11118/ejobsat.v4i2.120.

1 INTRODUCTION

The question of what moves prices in the financial market is in itself not a new one. Recently, this debate gained new ground due to the recent financial crises which started in mid-2007. Therefore, the landmark ruling by the German Federal Constitutional Court in Karlsruhe on 7$^{\text{th}}$ February 2014 in which they endorsed the efficient market hypothesis per Winkler (2014) is interesting on many levels. In a way, this highlights the question does the ruling mean that the German financial market is efficient? Furthermore, it raises an issue if the efficient market hypothesis is the key explanation of the price movement in the financial market then are the criticisms, as noted by Ball (2009) and Fakhry (2016), in the aftermath of the crises justified? The main question of what moves financial markets is important for researchers in the field of applied finance and portfolio manager, due to it being the underlining factor in investment decisions and portfolio optimisation. One of the key reasoning is that it is crucial for market participants wanting alphas for their investments decisions and portfolio optimisations.

Perhaps an explanation of the efficient market hypothesis or EMH would be ideal at this point. The EMH was developed thru the contribution of prominence articles by Fama and Malkiel such as: Malkiel (1962), Fama (1965), Malkiel and Fama (1970). At the basic level, the EMH hypothesize, as proposed by Malkiel (1962) and Fama (1965), that the price of any asset must immediately reflect fundamental information regarding the asset. The assumption is that market participants behave in accordance with the theory of perfect competition which is based on an idealise world where market participants are rational, risk averse and profit maximisers. Of course, recent events have illustrated that this is not always the case as Ball (2009) and Fakhry (2018) have shown. Therefore, there is a need to include behavioural finance in the pricing of any asset. The key argument underpinning behavioural finance is as put so elegantly by Thaler (2015, p. 4) market participants are homo sapiens and not homo economicus, hence as stated by Bernard Baruch: *"What is important in market fluctuations are not the events themselves, but the human reactions to the events."* (Lee et al., 2002, p. 2277)

A key factor in the efficiency of the market is the differentiation between long and short run price volatility behaviour. As suggested by De Bondt (2000), the price tends to deviate from the fundamental value in the short run. However, the price usually reverts to the fundamental value in the long run. This is more obvious during an asset price bubble; as hinted by Blanchard and Watson (1982) and Barlevy (2007). Essentially an asset price bubble is a rapid upwards pressure on the price, eventually causing systematic downwards pressure to correct the price. Often leading to a crash in the prices where the price is under massive downwards pressure. In the long run, the market could return to the fundamental price and hence be "efficient" or it could collapse. The price movements are driven by market participants' reaction to events and information which differ and may be asymmetric in the short-run and long-run.

In order to analyse the different impacts from the short and long run on the efficiency of the German financial market, we change the variance bound tests of Fakhry and Richter (2015, 2016a, 2016b) and Fakhry et al. (2017) to use an asymmetrical variant of the C-GARCH model proposed by Engel and Lee (1999). This will allow us to distinguish between the long and short run efficiency. We also contribute by using the Euro currency index and German All Maturity sovereign debt index obtained from the Bank of England and Barclays Bank plc respectively. In addition, we use the DAX stock index. Since Germany has the second largest gold reserve and is the fourth biggest consumer of gold according to the World Gold Council, we also use the Euro gold index obtained from the World Gold Council.

Our findings indicate that unlike previous studies conducted using the variance bound test e.g. Fakhry and Richter (2015, 2016a), we found evidence suggesting that the German financial market is efficient. All four observed German markets: equity, gold, sovereign debt and foreign exchange were efficient in both the long and short runs. This suggests that the differentiation between the short and long run is limited in the case of the German financial market. However, another possible explanation is the stability state argument of Fakhry (2016). Fakhry (2016) hints that during large observations containing both high and low volatile periods, the periods could cancel each other out leading to the market appearing to be stable and efficient. This is usually the case in the long run as argued by De Bondt (2000). However, as argued Engle and Lee (1999), in the short run the market is more volatile and reactive; thus should reflect an inefficient market. There is a clue in the previous statement, a reactive market can sometime lead to a false state of stability which gives the impression of an efficient market, especially over a long period of observation.

Our two key contributions is that we use the component GARCH-T to analyse the long and short run efficiency of the market. Thus leading to our main contribution, namely that the results defy the conventional wisdom in that we found that the German financial market seems to be efficient in both the long and short runs.

Furthermore we also contribute via the data we use. although previously many have used stock and FX indices to observe the efficiency of the financial markets, yet the use of sovereign debt and gold market indices has been limited in the area of financial econometrics in general. The second contribution is that we analyse the efficiency of the Euro currency index as obtained from the Bank of England which have also been limited.

This article is structured in the following way. Firstly, we will briefly and critically review the recent empirical literature on the EMH, behavioural finance theory and component GARCH model. This will lead to the methodology which will describe specification of the variance bound test and underlying asymmetrical component GARCH models. Sections four and five presents the data and empirical results. Finally, section 6 concludes.

2 LITERATURE REVIEW

The Literature review is divided into three key subsections: a review of the empirical evident on the EMH, behavioural finance theory and the Component GARCH model. This article will not review the theories and tests underpinning the EMH and behavioural finance theory, see Fakhry (2016) and Fakhry (2018) for a critical review of the theories and tests. The crucial factor is the differentiation of the long run and short run on the price volatility which impact the efficiency of the market.

2.1 Review of the Efficiency of the Markets

The empirical evidence of the past few years have illustrated that markets are not efficient during a period of highly volatile and reactive environment as highlighted by recent studies in the sovereign debt market by Fakhry and Richter. In a series of studies into the efficiency of the sovereign debt market, see Fakhry and Richter (2015, 2016a, 2016b), they found that in general market participants reacted to events rather than fundamental information during the recent financial and sovereign debt crises. A similar point was illustrated by Fakhry et al. (2017). However, these studies also highlighted some evidence of efficiency during several periods in several markets. Conversely, although Fakhry and Richter (2015, 2016a) provided mixed evidence of the efficiency of the German Bund market. In truth, the evidence was pointing to an inefficient market in the general sense; since in theory any market cannot be partly efficient.

The evidence in the stock market is also mixed as illustrated by several recent studies (i.e. Borges, 2010; Panagiotidis, 2010; Onali and Goddard, 2011; Todea and Lazar, 2012; Sensoy and Tabak, 2015; Singh et al., 2015). Conversely, Borges (2010) found a split in the European stock markets with the Greek and Portuguese rejecting and the western European countries including Spain accepting the weak form EMH. Also finding that the German market does accept the weak form of the EMH. Interestingly, Sensoy and Tabak (2015) studying the impact of long-time memory on the efficiency of the European Union stock markets during the recent financial and sovereign debt crises found mixed evidence. This seem to be backing the evidence found in the sovereign debt market by Fakhry and Richter (2015, 2016a, 2016b) and Fakhry et al. (2017).

In a way, the recent evidence on the efficiency of the FX market is similar to the previous two markets in that it is mixed see (Ahmad et al., 2012; Lee and Sodoikhuu, 2012; Boboc and Dinică, 2013; Mele, 2015). Lee and Sodoikhuu (2012) analysed the impact of market strategies on the efficiency of the FX Market, finding that in general the three observed FX markets are efficient. Conversely, transaction costs do have a greater impact on the efficiency of the FX market. A key finding in accordance with our article is that the euro/dollar FX rate is efficient. Mele (2015) find that arbitrage opportunities do exist for longer periods in the FX market, therefore violating one of the fundamental rules underpinning the EMH: arbitrage opportunities don't exist for long periods. By default, this means that the FX market is inefficient. The results conflict with that of Lee and Sodoikhuu (2012) in illustrating that the leading FX markets, including the Euro, are inefficient.

Like the other markets, the limited recent empirical evidence for the efficiency of the gold market seem to be hinting at an inefficient market. Although the empirical evidence is not direct testing the EMH, the literature is concentrating on a weak form of efficiency by using two methods. The first is cointegration as use in Narayan et al. (2010) and Zhang and Wei (2010), the argument is if the market has a cointegration relationship with other markets than the market is regarded as inefficient. Narayan et al. (2010) found that the gold market has a cointegration relationship with the oil market. Zhang and Wei (2010) also found a strong relationship between the gold and oil markets. The second is multifractal as use in Wang et al. (2011), the argument is that if the trend in the market is unexplained by a single factor then the market is regarded as inefficient. However, Wang et al. (2011) seem to be hinting at a rather mixed evidence with the gold market appearing to be efficient during upward trending periods and inefficient during downward trending periods. Mali and Mukhopadhyay (2014) provide further evidence of the multifractal nature of the gold market in the Indian, Chinese and Turkish markets therefore these markets are regarded as inefficient.

2.2 Brief Review of the Alternative Theory of Asset Pricing: Behavioural Finance

As we have seen the recent empirical evidence on the efficiency of the market is not strong, Hence there is a need to include the behavioural finance theory for a complete picture of financial asset pricing. So we will analyse the empirical evidence on key behavioural factors in recent years.

In studies by Fakhry et al. (2017) and Masood et al. (2018), they found evidence of overreacting in the sovereign debt market. The Greek market is relatively small in comparison with the size of the eurozone market, hence the Eurozone crisis was based on overreacting market participants. Also as hinted by Fakhry (2018), during the financial crisis market participants fleeing from the equity markets and mortgage backed securities were underreacting in the sovereign debt market, there is a pattern of behaviour during any flight top safety that tend to lead to an underreaction. Conversely, as Ball (2009) points out there was a hint of underreaction to the information underpinning the mortgage back securities during the asset bubble of the mid-2000s.

Analysing the impact of the Tohoku Tsunami of 2011 on the Japanese financial market, Fakhry et al. (2017) found overreaction in the equity, FX and sovereign debt market during the immediate aftermath. This is in line with previous studies like Maierhofer (2011), Luo (2012), Parker and Steenkamp (2012) and Ferreira and Karali (2015) who found no impact other than in the immediate aftermath. Thus hinting that an overreaction is nearly always short lived during extreme events.

Another behavioural factor often observed is herding, Nofsinger and Sias (1999) characterized this phenomena as trading in the same direction by a group of investors for a period of time. This is often the case during in extreme conditions such as bubbles as illustrated by Jiang et al. (2010), Sornette and Cauwels (2015) and Gerlach et al. (2018) and crashes as highlighted by Brunnermeier (2009) and Economou et al. (2011) during flights.

2.3 Review of Long/Short Run Volatility

As stated by Pastor and Stambaugh (2012), conventional wisdom dictates there is a different between the long and short run. Generally, markets are less volatile in the long run due to being less perceptive to shocks; hence they are increasingly stable. As Engle and Lee (1999) states volatility is greater in the short horizon than in the long horizon. This indicates a more rapid short run volatility mean reversion than in the long run as hinted by Engle and Lee (1999). Per Colacito et al. (2011), another important principle often made in economics is the existence of different long and short run sources affecting volatility. Additionally, as De Bondt (2000) hints the price reverts to the fundamental value in the long run. This means that the factors effecting the price and hence price volatility in the short and long runs are different. Effectively what De Bondt (2000), Pastor and Stambaugh (2012) and many others like Engle and Lee (1999) are hinting is the reaction of markets participants tend to deviate with time. Another factor, suggested by Engle and Lee (1999), is the different impact from the leverage effect and market risk premium on the market in the short and long run. In a paper written as part of a book in honour of Clive Granger, Engle and Lee (1999) extended the GARCH model to account for the permanent (long run) and transitory (short run) components of volatility deriving the component GARCH model (aka C-GARCH). In this section, we will review the empirical evidence on the C-GARCH model.

Recent empirical evident for the C-GARCH model seem to agree with the general conception that financial market volatility differentiate between long and short runs. Much of the literature is concern with the volatility in the stock market. Guo and Neely (2006) found evident consistent with Engle and Lee (1999) suggesting that long-run volatility better determines the international conditional equity premium than the short run volatility. Adrian and Rosenberg (2008) interprets the short-run volatility component as a measure of financial constraints tightness, while the long run volatility component is related to business cycle risks. However contrary to the accepted wisdom, Pastor and Stambaugh (2012) found that in accounting for predictor imperfection stock markets are more volatile in the long run. Du and Hu (2014) analysing the impact of the long run component in FX volatility on the stock market returns found that it does have explanatory power in determining the stock returns.

Analysing the Eurozone sovereign debt market, Sosvilla-Rivero and Morales-Zumaquero (2012) found a different between both volatility components. In general, the permanent component exhibited long memory while the transitory component exhibited short memory. They highlight that shocks are of higher importance than transitory shifts in the Eurozone sovereign debt market. Furthermore, they hint at a familiar split between the core and peripheral Eurozone countries in the transitory shifts with respect to the degree of policymakers' credibility and public finance's stability.

3 METHODOLOGY

The main aim of this paper is to extend the variance bound test of Fakhry and Richter (2015) and Fakhry and Richter (2016a) to analyse the efficiency of the markets in the long and short runs. We proposed a new variance bound test by extending Fakhry and Richter (2016a) using an asymmetrical C-GARCH, proposed by Engle and Lee (1999), variant of the variance bound test proposed by Shiller (1979, 1981). We use the 5% critical value F-statistics to test the efficient market hypothesis. As with Fakhry and Richter (2015, 2016a, 2016b) and Fakhry et al. (2017), we follow the pre-requisite steps advocated by Shiller (1979, 1981).

1. As illustrated by Shiller (1981), the key factor underlying any variance bound test is the variance calculation. We model the datasets in our test as a time varying lagged variance of the price using equation 1. We used the 5-lagged system, as oppose to the 20-lagged system advocated by Fakhry and Richter (2015).

$$\lim_{t\to T} \operatorname{var}(\text{Price}_t) = \frac{\sum_{q=1}^{Q} (\text{Price} - \mu)^2}{Q}. \quad (1)$$

2. The first order autoregressive model estimates the residuals in the econometric model underpinning the test as illustrated by equation 2 and 3:

$$\operatorname{var}(\text{Price}_t) = a + b_1 \operatorname{var}(\text{Price}_{t-1}) + \mu_t, \quad (2)$$

$$\mu_t = \tau \mu_{t-1} + \varepsilon_t. \quad (3)$$

3. Estimate the first order asymmetrical C-GARCH (1, 1) model to obtain the long run and short run volatility coefficients. It is worth remembering that the GARCH (p, q) model as proposed by Bollerslev (1986) is written as equation 4 where $h_t = \sigma_t^2$ and $k_t = \varepsilon_t^2$:

$$h_t = \omega + \alpha_p k_{t-1} + \beta_q h_{t-1}. \quad (4)$$

As suggested by Engle and Lee (1999), equation 4 can be slightly transformed into equation 5 where the dynamics of the structure of conditional variance can be illustrated:

$$h_t = \sigma^2 + (\alpha_p k_{t-1} - \sigma^2) + \beta_q h_{t-1} - \sigma^2). \quad (5)$$

The issue is that σ^2 represents the unconditional long run variance. However as argued by Engle and Lee (1999), at the heart of this equation is the question of whether the long run volatility is truly constant over time. Surely, a more flexible specification where the long run volatility is allowed to evolve lowly in an autoregressive manner is a more appropriate model of volatility, given the empirical evidence on time varying and mean reverting volatility as stated by Engle and Lee (1999). A more flexible model would be equation 6 whereby σ^2 is represented by m_t, a time-varying long run model of volatility.

$$m_t = \omega + \rho_p m_{t-1} + \varphi_q (k_{t-1} - h_{t-1}), \quad (6)$$

$$\begin{aligned}(h_t - m_t) \quad &= \quad \sigma^2 + (\alpha_p k_{t-1} - m_{t-1}) + \\ &\quad + (\beta_q h_{t-1} - m_{t-1}). \end{aligned} \quad (7)$$

Hence, equation 6 is a stochastic representatives of the long run volatility otherwise known as the trend in volatility and equation 7 is the difference between the conditional volatility and trend, i.e. the long run volatility. Essentially equation 7 is the short run or transitory volatility.

In essence, this means the dynamics of the volatility components can be interpreted as in three steps. Firstly, the short run volatility component is mean reverting to zero at a geometric rate of $(\alpha + \beta)$ under the condition of $0 < (\alpha + \beta) < 1$. Secondly, as highlighted previously the long run volatility component evolves over time in an AR process; conversely if $0 < \rho < 1$ then it will converge to a constant level of $\frac{\omega}{1-\rho}$. The third step is based on the assumption that the long run volatility component has a slow rate of mean reversion than the short run volatility component; simply put, the long run volatility component is the more persistent of the two components meaning $0 < (\alpha + \beta) < \rho < 1$.

We opt to use a single asymmetrical order one lagged C-GARCH model in our tests. Remember the short run volatility component is given by equation 7. The TARCH model as defined by Zakoian (1994) is given by equation 8. Taking equation 8, we could transform it to a single order asymmetrical C-GARCH model by subtracting the long run volatility from each term in the equation to give equation 9. Notice how if the asymmetrical effect is zero the basic model collapses to a CGARCH model as illustrated by equation 7. A key factor is that the asymmetrical effect is only added to the short run component of the C-GARCH model, see equation 9. This is mainly due to the short life of the asymmetrical effect.

$$h_t = \alpha k_{t-1} + \beta h_{t-1} + \gamma k_{t-1} I, \qquad (8)$$

$$\begin{aligned}(h_t - m_t) \quad &= \quad \sigma^2 + (\alpha_p k_{t-1} - m_{t-1}) + \\ &\quad + (\beta_q h_{t-1} - m_{t-1}) + \\ &\quad + \gamma(k_{t-1} - m_{t-1}) I, \qquad (9)\end{aligned}$$

where $I = \begin{cases} 0, & \varepsilon_t \geq 0, \\ 1, & \varepsilon_t < 0. \end{cases}$

As with Fakhry and Richter (2016a, 2016b), we also illustrate the impact of the asymmetrical effect on the efficiency of the market. The key is the γ coefficient in equation 9 where $\gamma \neq 0$ then there is an asymmetrical effect; if $\gamma > 0$ then there is a leverage effect meaning negative shocks have greater impact than positive shocks.

As noted by Engle and Patton (2001), there is a story within any member of the GARCH family of volatility models influenced by the coefficients in the transitory and permanent variance equations. Since as illustrated by Engle and Patton (2001), the market shocks and persistent are indicated by the coefficients α and β, respectively. Therefore, we can deduce that ϕ and ρ indicate the long run market shocks and persistent, respectively.

The coefficients of the Component-GARCH model of volatility are also key to our variance bound test. As mentioned earlier in this section, we derive our EMH test by using the f-statistics; for our observed samples, the f-statistics at the 5% level is 1.96. We calculate our test statistics using equation 10 and 11 as the short run and long run tests of efficiency respectively.

$$\begin{aligned}\text{EMH Test}_{\text{SR}} \quad &= \quad \frac{(\alpha + \beta + \gamma) - 1}{\text{std. dev. } (\text{var}(x))} \leq \\ &\leq \quad F\text{-statistics}, \qquad (10) \\ \text{EMH Test}_{\text{LR}} \quad &= \quad \frac{(\rho + \phi) - 1}{\text{std. dev. } (\text{var}(x))} \leq \\ &\leq \quad F\text{-statistics}. \qquad (11)\end{aligned}$$

By definition the market is efficient when the conditions as set in equations 10 and 11 are true. Theoretically, the market is only truly efficient when the EMH test statistics is equal to the f-statistic. Hence, we reject the null hypothesis for the EMH if the condition in equations are true but accept the null hypothesis of the market being too volatile to be efficient for anything else.

4 DATA DESCRIPTION

As stated previously, this paper analyses the three major German financial markets to establish whether the court ruling means they are efficient. With this in mind, we test the efficiency of the equity, FX and sovereign debt markets. As illustrated in, we opt to use the price on indices to reflect the German financial market. As with the norm, we choose to use a five-day week filling in the missing data with the last known price.

It must be noted that similar to all indices the four indices are based on weighted ratios of the components prices. The DAX consist of thirty of the largest listed companies on the German equity market each weighted by a given ratio. The Euro Currency Index[1] is calculated on a

[1]For a description of the index and how it is calculated see the following Bank of England website: `http://bankofengland.co.uk/statistics/pages/iadb/notesiadb/Effective_exc.aspx`.

daily basis by the Bank of England using the five major currencies with a weighted ratio: US Dollar, British Sterling, Japanese Yen, Swiss Franc and Swedish Krona. As hinted by the name, the German All Maturities Government Index consists of all the government bonds maturities weighted by a ratio. The Gold Price Index consist of all gold markets in the Eurozone indexed to 1st January 1999.

A key issue with our variance bound test was the standard deviation of the DAX Index and Gold market variances which caused a problem with the EMH test statistics. We tried several methods to resolve the issue, the best solution was to divide the daily index price by 100 and 10 for the DAX and Gold prices respectively before calculating the five-day variance.

5 EMPIRICAL EVIDENCE

As hinted earlier, the keys to the EMH test statistics are the coefficients to the variance equation of the volatility model and standard deviation of the observed dataset. Hence in essence the model of volatility estimated determines the statistics. In Fakhry and Richter (2015) and Fakhry et al. (2017), the estimated model was the GARCH. In Fakhry and Richter (2016a, 2016b), the model used was the GJR-GARCH. The GJR-GARCH had the influential factor of allowing for the analysis of the asymmetrical effect on the EMH. We continue to use the asymmetrical effect in this paper, however we also analyse the effect of long and short runs on EMH. For this reason, we use the C-GARCH with an asymmetrical factor in the estimation of the coefficients. We test for overall, long run and short run efficiency. We also analyse the behaviour of the German financial market volatility.

Tab. 2: Model Settings

Option	Setting
Optimisation Method	EViews Legacy
Legacy Method	Marquandt
Max Iterations	5,000
Convergence	0.0001
Coefficient Covariance Method	Ordinary
Starting Coefficient Values	EViews Supplied
Presample Variance	Backcast with parameter = 0.7
Derivative Method	Accuracy

In estimating the models, we used the settings in Tab. 2. However, with the error distribution, we used a different distribution model for each dataset to get the best estimation: Equity (Normal), FX (GED), Sovereign Debt (Student's t) and Gold (Student's t). Crucially, the system environment may influence the estimation: Our system is running EViews 9.5 on a Windows 10 Pro, 6 cores CPU and 24 Gigabytes RAM computer[2].

A general summarization is the observation of a different in the behaviour of price volatility between the long and short runs in all three financial markets. It is to be noted that the volatility seems to be more persistence in the long run than the short run. However as argued by De Bondt (2000), the evidence seem to suggest that the market is reverting back to the fundamental value in the long run. A key explanation is persistency in market volatility can only be observed in the long-run, since the persistent is based on long memory behaviour as hinted by Engle and Lee (1999). However, the markets seem to be highly reactive in the short run. This appears to be in accordance with the accepted wisdom of volatility being greater in the short run than the long run as argued by Engle and Lee (1999) and Pastor and Stambaugh (2012). This is to be expected, since behavioural theories dictate that market participants react with greater intensity to news in the short run as hinted by Engle and Lee (1999). In effect this means that the effect of the reaction of the German market participants on financial market volatility is deviating with time as suggested by Engle and Lee (1999), De Bondt (2000) and Pastor and Stambaugh (2012).

[2] We tested on a different environment got slightly different estimation results.

Tab. 1: Major German Financial Markets Indices

Market	Equity	Foreign Exchange	Sovereign Debt	Gold
Index	DAX	Effective Exchange Rate Index, Euro	German all Maturities Index	Gold Price Index, Euro
Source	investing.com	Bank of England	Barclay Risk Analytics & Index Solutions Ltd.*)	World Gold Council
Period	from 02/01/1981 to 31/12/2016	from 02/01/1975 to 31/12/2016	from 31/12/1997 to 31/12/2016	from 29/12/1978 to 30/12/2016
Observations	6,783	10,957	4,958	9,916

Note: *) It must be noted that on the 24th August 2016 the Barclay Risk Analytics and Index Solutions Ltd. was taken over by Bloomberg. So, the product is now known as Bloomberg Government bonds.

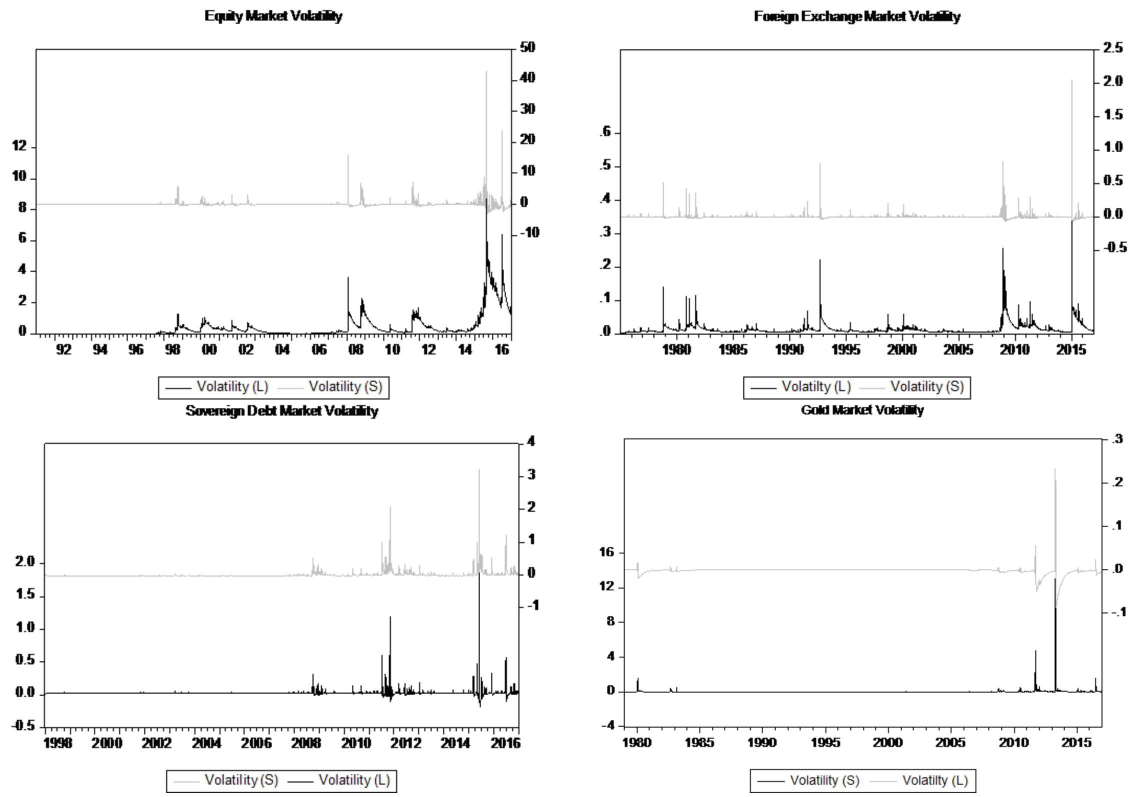

Fig. 1: German Financial Markets Volatility Components

The observed period is interesting because it highlights the different impact of major events on the long and short run volatility. Essentially, Fig. 1 highlights the impact from two key events on the German financial market, financial crises of late 2007 to 2016. Whichever way you look at it, the financial crises seem to have a strong effect on the three observed markets. Conversely, the Brexit vote on 23rd June 2016 extended the volatile period. Of cause the introduction of the Euro on 1st January 1999 is of significant interest to the German financial market, yet the evident from Fig. 1 seem to hint at a slight impact on the equity and FX markets but none on the sovereign debt and gold markets. However, it is worth remembering that these two markets are regarded as safe havens and the introduction of the euro was not regarded as a risk. Another possible explanation is due to the large impact of the financial and sovereign debt crises on these two markets, the volatility in these two markets deviated away. Remember a key theory of the GARCH/ARCH models as intended by Engle (1982) and Bollerslev (1986) is that volatility deviates over time, so a highly volatile event in the past becomes less influential with time on the observed dataset. The other major event is the aftermath of the re-unification of Germany in 1990 which seem to be highlighted in the FX market but not in the equity and gold markets. However, a key factor during that period could be the impact from Black Wednesday on 16th September 1992 and the effect it had on the European Exchange Rate Mechanism (ERM).

The high ρ coefficients in Tab. 2 seem to be indicating the presence of highly persistent permanent volatility in the equity and FX markets. On close inspection of Fig. 1, the reasoning becomes clear, both markets were at the heart of periods of constant highly volatile environment as illustrated in the previous paragraph. Market participants are highly reactive to events such as these. The second factor is the long-run effects of the introduction of the Euro and the recent financial and sovereign debt crises which contributed to the high persistent of volatility. It would seem that the recent crises were also a relevant contributory for the high persistency in the gold market. Conversely, Fig. 1 also explains the low volatility persistence in the sovereign debt market as illustrated by the ρ coefficient of the market in Tab. 3. In comparison to the other three observed markets, the sovereign debt market seemed to be relatively stable until the recent crises with only a few minor hikes in volatility. A possible explanation is generally during a period of economic and financial market upturn like the early to mid-2000s, market participants are less reactive and thus market volatility is less persistent. This leads to another explanation, during a period of increasing asset prices, market participants look for high return risky markets, in simple terms acting irrationally leading to a bubbled market. The sovereign debt market is generally regarded as a risk-free low earning market, especially the German market. As explained earlier, the short run volatility persistent tends to be generally low, a point in case are the observed β coefficients of all four markets in Tab. 3. The coefficients seem to be hinting at very low volatility persistency in all four markets with coefficients of not greater than 0.708.

As implied by Engle and Lee (1999), theory dictates over a long-time horizon market shocks tend to decay in ferocity. Thus, meaning that in the long run the effect of any event inducing high market shocks on prices become less relevant. This is observed in the equity, gold and FX markets as illustrated by Tab. 3 with the φ coefficients pointing to a lower market shock in the long run. In effect the φ coefficients are under 0.1 for all three markets hinting at a low sensitivity to market shocks. As Fig. 1 illustrates, all three markets suffered a significant hike in price volatility during the recent crises period plus the Brexit vote and the coefficients, greater than 0.2, seem to be reflecting this hike. Mainly due to the timing and severity of a combination of events (i.e. the recent Eurozone sovereign debt crises and Brexit vote) and the German sovereign debt market status as the safe haven and liquid market in the Eurozone, the long run effect of the shocks in the sovereign debt market did not decay away given the time horizon as illustrated by the φ coefficient at 0.186334. In the short run, the high coefficient of 0.312428 is a sign of the market during the crises period.

A key observation made in Fakhry and Richter (2016a, 2016b) is that the asymmetrical effect has an impact on the efficiency of the market. As illustrated by Tab. 3, we observed a low γ coefficient for all four markets with absolute value of no greater than 0.09 observed in the gold market. This does mean that there is a limited asymmetrical effect in each of the markets. The equity and gold markets display a negative γ coefficient which means that negative shocks to the market have greater impact than positives shocks in the short run. As hinted by Black (1976), a key observation often made in the equity market is the negative correlation between returns and volatility. The limited leverage effect is a hint of this observation. The key word in there being limited, for an

Tab. 3: Statistics for Variance Bound Test using Asymmetrical C-GARCH model

Equations:

(6) $m_t = \omega + \rho_p m_{t-1} + \varphi_q(k_{t-1} - h_{t-1})$

(9) $(h_t - m_t) = \sigma^2 + (\alpha_p k_{t-1} - m_{t-1}) + (\beta_q h_{t-1} - m_{t-1}) + \gamma(k_{t-1} - m_{t-1})I$

(10, 11) $\text{EMH Test} = \dfrac{\sum \text{coefficients} - 1}{\text{std. dev. (var(Price))}}$

Market	**Equity**	**Foreign Exchange**	**Sovereign Debt**	**Gold**
Mean Equation				
a	0.071782*	0.009607*	0.020584*	0.005543*
	(0.002136)	(0.000192)	(0.000678)	(8.41E-06)
b	0.716483*	0.736035*	0.691017*	0.719573*
	(0.006919)	(0.003483)	(0.006640)	(0.001878)
μ	0.507201*	0.306194*	0.377432*	0.375839*
	(0.013024)	(0.006653)	(0.015129)	(0.000891)
Volatility Equation				
ω	7.480590*	0.029847	0.026859	−2.37E-05
	(0.384085)	(0.033685)	(0.003366)	(2.16E-06)
Long-run Price Volatility				
ρ	0.999998*	0.998977*	0.847473*	0.987450*
	(6.43E-08)	(0.001167)	(0.023697)	(9.24E-04)
φ	0.039161*	0.087957*	0.186334*	0.008243*
	(0.000976)	(0.022952)	(0.022307)	(0.002056)
Short-run Price Volatility				
α	0.213435*	0.359580*	0.312428*	0.453493*
	(0.003626)	(0.019467)	(0.017036)	(0.020139)
γ	−0.019528*	0.062521*	0.012089*	−0.092895*
	(0.005517)	(0.007920)	(0.001591)	(0.015680)
β	0.707345*	0.577842*	0.675722*	0.646091*
	(0.005470)	(0.025604)	(0.017817)	(0.008971)
Model Statistics				
Log Likelihood	1,374.877	20,161.730	7,075.928	28,617.290
R^2	0.719687	0.712889	0.725742	0.751854
DW-Statistics	2.156971	1.625504	1.575250	1.686794
ARCH Effects	0.339560	0.028096	0.018395	0.526407
Jarque-Bera	434,325.400	22,946,634.000	491,035.900	3,280,997.000
σ^2	1.193893	0.166384	0.317139	0.233287
Efficiency Tests				
Long-run Efficiency				
EMH Statistics	0.032799	0.522490	0.106600	0.018462
Efficiency	Accept	Accept	Accept	Accept
Short-run Efficiency				
EMH Statistics	0.082711	0.000343	0.000754	0.028673
Efficiency	Accept	Accept	Accept	Accept

Notes: The numbers in brackets are standard errors, *** indicated 10% significance level, ** is 5% and * is 1%.

explanation we need to look at the observed German equity and gold markets. It is highly possible that during the period before the onslaught of the recent global financial crises, both markets experienced one type of asymmetrical effect. However, the onslaught of the recent global financial crises changed the asymmetric effect. The positive and negative effects may have counter-balanced each other, hence leading to the near zero impact. Conversely, due to the timing and ferocity of the negative impact on the markets during the recent global financial crises, there is a limited leverage effect. The two remaining markets point to a limited positive asymmetrical effect hinting at positive shocks to the market having a greater impact than negative shocks in the short run. An explanation for the observations of positive asymmetrical effects could be found in a combination of the global status of both markets and the recent global financial environment. This added to the reversed of the combination effect underpinning the explanation of the observed limited leverage effect in the equity and gold markets means that the FX and sovereign debt markets exhibit slight positive asymmetrical effects.

A key measure of risk factors in the market is the standard deviation, essentially defined as the dispersion of the observed market prices around the expected market price. The standard deviation statistics from Tab. 3 seem to be hinting at a large dispersion from the expected price variance in the equity market with a σ^2 of approximately 1.194. A clue is in Fig. 1, both the long and short run volatilities hint at a large hike in the equity market during the recent financial crises which gives the impression of a large dispersion in the equity market. The FX market has a low standard deviation of approximately 0.166, this is to be expected since the euro did not deviate from the expected value by much. Even during the Eurozone crises, the movement against the benchmark currencies was not that great in both the long and short runs, as hinted by Fig. 1. The sovereign debt market suffered from spikes in the volatility during the Eurozone crises which is indicated by the low standard deviation of 0.317 and the level of volatility in Fig. 1. It must be noted that the German sovereign debt market is regarded as the risk-free benchmark market in the Eurozone, so the movement in the market was mainly due to runs in the Eurozone markets leading to upward pressures on the German sovereign debt market. And as the age old saying by Isaac Newton goes: *"what goes up must come down"* eventually, hence the normalisation of the sovereign debt market towards the fundamental long run value may have also been a factor in the moderate standard deviation. The same could be said about the gold market, remember the gold market is the global safe haven market. In essence, the gold market, similar to many other commodity markets, suffered a bubble reaction during the global financial crises. However, the low dispersion is a sign that the impact of the global financial crises did not impact the overall observation.

Essentially, our variance bound test is saying that for a market to be efficient it must be efficient in the short and long runs. As illustrated by Tab. 3, the significant of the variance bound test is the results seem to be hinting at the acceptance of the EMH in all the observed markets in both the short and long runs. The statistics are damming for behavioural finance with EMH statistics not greater than 0.6, it must be remembered that these are well within the bound of 1.96.

6 CONCLUSION

In this paper, we extended the work done by Fakhry and Richter in recent years to analyse the efficiency of the German financial market in the short and long runs. We differed from previous work by Fakhry and Richter in using a five-day variance calculation and the key indices of the German market. We used a Component GARCH including a threshold to obtain the short and long runs' volatility and coefficients for our EMH tests.

Our results show that the German financial market is efficient in both the short and long runs. The results seem to be a damming rejection of the behavioural finance theory and an endorsement of the court ruling. However, as is the case with any test there are a number of factors to account for. The first and foremost is the observational period in all the market, if the period was based around the financial and sovereign debt crises then the results may have been different. The second is the volatility model, i.e. Component GARCH, underpinning our volatility tests could be a key factor in the acceptance of the EMH. It would be interesting to see if the German financial market was efficient around the crises period of the late 2000s to early 2010s. Given that the results of Fakhry and Richter (2015, 2016a, 2016b) did found that the German market is generally inefficient during the crisis period.

Our main contribution, the methodology, is relevant in analysing the long and short run efficiency of the market and therefore making the optimal investment decision be it in an asset or as part of a portfolio. The results of our empirical study are important for researchers in the fields of applied finance and portfolio management. Additionally, the paper can be useful for portfolio managers and market participants in making investment decisions or portfolio optimisation.

In concluding, the results seem to suggest that the court case was right to endorse the EMH. However, we urge caution on rejecting the behavioural finance theory due to past empirical evidence suggesting that the German market is not always efficient.

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READY FOR CHANGES? THE INFLUENCE OF GENERAL SELF-EFFICACY AND RESISTANCE TO CHANGE ON MANAGERS' FUTURE COMPETENCE REQUIREMENTS

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EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 4 Issue 2
ISSN 2336-6494
www.ejobsat.com

ABSTRACT

With this study, we will test the interrelations between the psychological concept of self-efficacy of managers and its influences on the resistance to change. The results show that it makes a qualitative difference, if change in competences occurs in a positive or a negative direction and that there is a clear predisposition of managers concerning change. Both results have to be taken into account in designing changes processes.

KEY WORDS

competence management, self-efficacy, resistance to change

JEL CODES

M100, O100

1 INTRODUCTION

For more than a hundred years, the topic of what tasks a manger has to fulfil and what the manager of the future will look like has been much reflected on. While in earlier days the main emphasis was on the analysis of the job and functional aspects such as planning, coordinating and organising, management discourse changed drastically with the introduction of post-bureaucratic reforms and the rise of the competence movement (McClelland, 1973). Instead of the workplace, the focus is now on the persons themselves as well as their abilities, knowledge and skills. Subsequent studies proposed several competences managers should possess, including interacting with people, presenting, organizing and executing. Because of current trends such as globalisation and the increasing amalgamation of occupational and private life (Ford and Collinson, 2011), managers are furthermore expected to act effectively in unforeseeable and complex situations. In other words, managers should have a range of competences that enables them to act in a self-organised manner (Erpenbeck and von

MÜHLBACHER, Jürgen, and SIEBENALER, Tom. 2018. Ready for Changes? The Influence of General Self-Efficacy and Resistance to Change on Managers' Future Competence Requirements. *European Journal of Business Science and Technology*, 4 (2): 126–142. ISSN 2336-6494, DOI http://dx.doi.org/10.11118/ejobsat.v4i2.131.

Rosenstiel, 2003) – even in a rapidly changing business environment. As a direct consequence of these new changes, companies were more and more looking for “managers of the future, not of the present” (Woodruffe, 1993, p. 34).

However, despite their importance, future-oriented competences in competence research have been greatly neglected (e.g. Robinson et al., 2007). A main reason is that competence assessment methods such as the critical behaviour interview largely focused on a manger’s past performance. Competence requirements were thus in the best case present-oriented and in the worst case derived from past events. Only recently, both past and future competences have been analysed to a greater extent (e.g. Campion et al., 2011; Mühlbacher, 2007). Scholars such as Robinson et al. (2007) proposed several methodological principles (e.g., including a time horizont) and more recent studies empirically examined the future significance of managerial competences required by healthcare executives and commercial kitchen chefs (e.g. Giousmpasoglou et al., 2016).

According to Woodruffe (1993), there are two options for looking into “the future”: the focus of analysis is either on change competences, which are required in order to deal with unforeseeable situations, or on changing competences, which represent future competence requirements. The former group – competences of “changeability” (Woodruffe, 1993, p. 35) – has been extensively studied (e.g., Paton and McCalman, 2008) and often presented in the form of lists. On the other hand, previous works on “competency life cycles” (e.g., Sparrow and Boam, 1992) clearly differentiate between emerging and maturing competencies and point toward the changing nature of competences. Recent developments such as constantly changing requirements at work, high expectations from managers, and increasing competition (Tripathi and Agrawal, 2014) strengthen the demand for a better understanding of future competence requirements which are therefore the subject of this study.

Empirically, it can be shown that managers greatly differ in their competence requirements (e.g., Lakshminarayanan et al., 2016). Some perceive an increasing demand for competences of a particular class, while others detect a fall. In other words, not all managers respond in the same way to the idea of changing competences (e.g., Boyatzis and Saatcioglu, 2008; Dierdorff et al., 2009). The question why managers see different requirements and what factors explain this difference in perception has not been addressed in the literature so far. Thus, this study aims at closing this research gap and at identifying potential predictors that explain the rise and fall in competence requirements.

It can be argued that the concept of the self is the starting point for every change process that affects a person’s actions, habits or competences (Boyatzis, 2006; Taylor, 2006). Besides competence research, the psychology of the self hence is a theoretical basis for this study. Competences are seen as prerequisites for self-organised behaviour, which allow managers to act even in unforeseeable situations (Erpenbeck, 2011; Erpenbeck and von Rosenstiel, 2003). Knowledge of one’s own self is often formulated in a so-called theory of the self which assumes that people aim for a better understanding for themselves and rely on their self-knowledge when making decisions (Oyserman et al., 2012). The best known such theory is the theory of cognitive dissonance (Festinger, 1957), which postulates that people generally strive to be consistent in their behaviour and act in line with their self-concept. In case of a discrepancy, on the other hand, people experience discomfort and a certain state of tension, also called dissonance. They are subsequently motivated to either change their attitude or behaviour in order to appear reasonable in their decisions.

A further important component is the dispositional perspective. It presumes that people have certain psychological predispositions towards changes (Holt et al., 2010). Accordingly, personal characteristics should play a crucial role in the perception of a change as a benefit or a threat (Vakola et al., 2013). More specifically, several authors argue that the perceived ability as well as a person’s will to accept changes have a strong influence on how changes are dealt with (e.g. Holt et al., 2010). In the following study, the perceived ability is operationalised through the use of the personality trait of general self-efficacy (Judge et al., 1998), which captures the generalized belief of individuals to possess the resources required to fulfil task demands (Chen et al., 2001). On the other hand, the willingness to accept changes is operationalised by means of a person's resistance to change (Oreg, 2003), which can be defined as a predisposed inclination of an individual to avoid change. Studies have shown that both personality traits are connected with how changes are dealt with (e.g. Judge et al., 1999; Oreg, 2006). For this reason, these were then tested as predictors of rising or falling competence requirements.

The research model suggested can thus be seen as an answer to the criticism of competence research to neglect future-oriented competences. By including not only current and future competences, but also potential predictors of competence requirements, the study additionally aims to find an answer to the question of what factors predict a rise or fall in competence requirements. Competence research, the theory of the self, and the dispositional perspective of change management thus build the theoretical foundation to answer the following research question: what influence do personality traits – in the form of general self-efficacy and resistance to change – have on the increase and decrease in competence requirements?

2 THEORETICAL BACKGROUND

The theoretical background of this study is based on competence research, the theory of the self and the dispositional perspective in change management.

2.1 Competence Research

The most important objectives of occupational competence development are the establishment and promotion of professional behavioural competence. The main focus is put on the integration of cognitive, emotional-motivational, volitional and social aspects of human behaviour in work situations (Heyse, 1997, p. 6). An early differentiation was provided by Jacobs (1989, p. 36), who distinguishes between "hard and soft competencies". Hard competences refer to, for instance, analytical and organisational abilities, while creativity and sensitivity are part of soft competences. From this, Jacobs derives the assumption that hard competences result in observable behaviour and, at the same time, the invisible but controlling soft competences are underlying elements.

This distinction was later differentiated into four types of competence, which meet both theoretical and pragmatic requirements (Heyse, 1997, p. 6). A concise overview of these four competence classes can be found in Sonntag and Schaper (1999, p. 411ff). They include professional competence, method competence, social competence as well as self- and personal competence. This classification was then reworked itself. In more recent classifications, particularly professional and method competences have been fused, due to their similarities and a desired construction of a general competence model, while self- and personal competence are sub-divided further. The aim is to enable a differentiated observation of dispositions and self-organised behaviour.

The concept by Erpenbeck and von Rosenstiel (2003) – though working on a more abstract level – provides a current classification. It also comprises four general competence classes, but their differentiation is based on the idea that mental or physical behaviour always represents subject-object or subject-subject relationships. Self-organised behaviour can (1) reflexively relate to the acting person itself or (2) relate to the professional-methodical recognition and change of the concrete environment. It can be (3) oriented towards the social environment and thus to other persons and groups or it (4) more closely characterises the activity and willingness component of the actor (Erpenbeck and von Rosenstiel, 2003, p. XV). From this, generally the following competence classes can be derived (Erpenbeck and von Rosenstiel, 2003, p. XVI): (1) personal competences, (2) professional-methodical competences, (3) social-communicative competences and (4) activity- and implementation-oriented competences.

Although this classification is a general taxonomy, the authors themselves remark that allocating individual and sub-competences to these classes might lead to problems. This holds particularly true for the difficult demarcation of the class of activity- and implementation-oriented competences, which in fact only refers a person's ability to implement – and thus a combination of his or her professional-methodical and social-communicative competences. Further problems might arise in allocating traits (such as ambition, diligence or persistence) that might belong to either the first or the fourth class (Erpenbeck and von Rosenstiel, 2003, p. XVI).

Therefore, this study mainly focuses on the general differentiation between professional and method competences on the one hand and social competences on the other. Although the state of the art is reduced, this makes a connection to the central leader-manager differentiation possible (Bennis, 1989). According to this, "managers" are executives, who put an emphasis on control, prefer orderly proceedings and are rather professionally competent. "Leaders", in contrast, think for the long term, want to convey a vision and have social-communicative competences (Bennis, 1989).

2.2 Theory of the Self

As it can be argued that individuals cannot evaluate their own competences and future competence requirements without taking recourse to their own self-concept (Crocker and Canevello, 2012, p. 263), the self plays an important part. A person's self influences all their behaviour, habits and competences and can be interpreted both as the starting point (e.g. Boyatzis, 2006, p. 613; Taylor, 2006) and the subject of change processes. In addition, the self, in the form of self-organisation theory, is closely connected with competence research (Erpenbeck and Heyse, 1999; Erpenbeck and von Rosenstiel, 2003). Psychological theories of the self can therefore bring new insights regarding rising and falling competence requirements.

The theory of cognitive dissonance (Festinger, 1957) is regarded as one of the most influential theories of the self (e.g. Nail et al., 2004) and postulates that people strive to act consistently and to make rational decisions vis-à-vis the outside world. If there is a discrepancy between one's own values (e.g. healthy lifestyle), cognition (e.g. seeing oneself as a sportsperson) and behaviour (e.g. smoking), individuals experience an inner tension, also called dissonance. The greater the discrepancy, the stronger the desire to release this tension. The self-affirmation theory (Steele, 1988), a variant of dissonance theory, assumes that people generally are motivated to maintain a positive image of self-integrity. Thoughts, events or behaviour that threaten this image of self-integrity are perceived as a psychological threat (Cohen and Sherman, 2014).

In order to counter this threat, people tend to emphasise their individual strengths and thus to newly define success. An important mechanism is to have access to several existing identities and therefore have different sources of integrity available (Steele, 1988). By means of self-affirmation it is thus possible to compensate for perceived mistakes by being successful in other areas relevant for the self (e.g. a specific competence, a certain hobby). In other words, self-affirmation allows for a constant reinterpretation of events that are important to maintain one's own self-image by placing the focus of attention on successful characteristics.

2.3 Dispositional Perspective in Change Management

As rising and falling competence requirements can be perceived as either a positive or negative change by the managers (e.g. Bouckenooghe, 2010), the research field of change management also is a theoretical foundation for this study. The dispositional perspective in change management is particularly important in this context, as a number of studies have pointed out the influence of personality traits in the change process (e.g. Herold et al., 2007). Judge et al. (1999), for instance, identified a total of seven personality traits (e.g. general self-efficacy, locus of control) that are related to tackling changes. The dispositional perspective thus assumes that individuals are predisposed to react to changes in a certain manner and regard these as either threatening or useful (e.g. Oreg et al., 2011; Vakola et al., 2013). It is further argued that the willingness to change requires both the will to accept changes and a certain degree of self-confidence or self-efficacy to successfully cope with the changes to come.

General self-efficacy was conceived on the basis of Bandura's (1977) concept of self-efficacy, which describes a person's conviction to be able to deal successfully with even difficult situations in their own right (Łuszczyńska et al., 2005). Originally conceived as a situation-specific construct, self-efficacy includes a perceived feeling of control with which people can change their behaviour. Also empirically, a connection between persons' self-efficacy and their willingness to accept changes has been found (e.g. Amiot et al., 2006).

In order to record the influence of how convinced people are of their own self-efficacy irrespective of the situation, Bandura's original concept was conceived as a personality trait (Judge et al., 1998). The concept of general self-efficacy developed from this describes the personal assessment of one's own competences to tackle challenges in various situations. Several studies have shown that people evaluate changes depending on their general self-efficacy (e.g. Hornung and Rousseau, 2007). One explanation for this connection is the existence of a self-reinforcing mechanism (Judge et al., 1998). Persons with a high general self-efficacy, for example, increase their chances for success, which in turn reinforces them in their competences. On the other hand, it is argued that a high degree of general self-efficacy in different situations tempts people into acting proactively and flexibly. For these reasons, it is presumed that general self-efficacy has an influence on rising and falling competence requirements:

H_1: *General self-efficacy influences rising and falling competence requirements.*

The component of willingness is operationalised using the concept of resistance to change. Research into the question why certain people are negatively disposed towards changes and actively resist them goes back all the way to the year 1948, when Coch and French (1948) analysed the phenomenon empirically. Over the years, a multitude of definitions emerged with a common negative focus on changes (Bouckenooghe, 2010). This traditional point of view, which generally related changes to stress, was more and more criticised at the beginning of the 2000s (e.g. Piderit, 2000). The argument was that the majority of studies on this topic relied too much on the behavioural level (what do people do to resist changes) and, in turn, the cognitive (what do people think of changes) and emotional (what do people feel in view of changes) components were neglected.

Responding to this criticism, Oreg (2003) has suggested conceptualising resistance to change as a personality trait that includes cognitive, affective and behavioural elements. Resistance to change in this sense is described as a predisposed tendency to avoid changes. A person with a high level of resistance to change thus perceives changes as rather negative, more frequently associates them with negative feelings and generally integrates fewer changes in his or her daily life. In a comprehensive survey article on the subject of reactions to changes covering a period of 60 years, Oreg et al. (2011) describe resistance to change as a predictor of changes. Similarly, several authors argue that resistance to change is one of the main reasons for differences in people's willingness to change (e.g., Oreg and Sverdlik, 2011). For these reasons it is assumed that resistance to change also has an influence on rising and falling competence requirements:

H_2: *Resistance to change influences rising and falling competence requirements.*

3 METHODOLOGY AND DATA

Constructs that cannot be measured directly – such as personality traits or competence requirements – often manifest in a culture-specific form (e.g., Fischer and Schwartz, 2011). As a review of several guidelines for cross-cultural adaptation "could not bring out a consensus" (Epstein et al., 2015, p. 435) on how to limit possible cultural biases, the following study was conducted in a culturally diverse environment: The Grand Duchy of Luxembourg. As a founder member of the European Economic Community (EEC), the tranquil Grand Duchy is the seat of several EU institutions (e.g. European Court of Justice, European Court of Auditors, European Investment Bank) and is seen, besides Brussels and Strasbourg, as an EU capital. Its international orientation is also reflected in its population figures: in 2016, the percentage of foreigners living in Luxembourg was 46.71% (STATEC, 2016). Resident foreigners also account for 71% of the working population (Luxembourg for Finance and Luxembourg for Business, 2015). The more than 170 nationalities, numerous commuters and the phenomenon of multilingualism further characterise Luxembourg's cultural diversity. Moreover, with a growth rate consistently above the EU average and a public debt at only 23.20% of the gross domestic product (Luxembourg for Finance and Luxembourg for Business, 2015), Luxembourg will remain attractive for foreigners from all over the world. For this reason, Luxembourg lends itself for a study of competence requirements, which are also needed internationally. The empirical survey was thus based on a self-selective sample of 274 Luxembourgish managers. The following method section provides more detail on the sample of participants, the variables collected, and data collection and analysis.

3.1 Sample

Data were collected between June 2015 and February 2016. In this stage, a total of 2,226 managers working in various sectors in Luxembourg with at least one direct employee were contacted. Of these, 274 managers replied, which is a response rate of 12.31%. According to Tabachnick and Fidell (2007) as well as Field (2013), this is a sufficient sample to calculate a robust regression model. During data collection, the participants were asked to state whether they were active in top, upper or middle management. The sample turned out to include 104 participants (37.96%) from top management, 75 (27.37%) from upper management, and 95 (34.67%) from middle management.

Of the 274 managers, 39 were women (14.23%) and 235 men (85.77%). The average age was 49 years (SD = 7.15), with 24 managers between 30 and 39 years (8.76), 100 between 40 and 49 years (36.50%), 135 between 50 and 59 (49.27%) and 15 older than 60 years (5.47%). In the sample, altogether 17 nationalities were represented, with a majority of the managers stating to be Luxembourg nationals (48.18%). Other large groups of managers were Belgian (16.79%), French (16.42%) and German nationals (8.03%). The sample thus reflects the multicultural environment of Luxembourg and underlines the influence of cross-border workers (Thewes, 2008). When asked for their mother tongue, most managers replied Luxembourgish (44.53%), French (34.31%) and German (10.58%). Regarding their education, 167 managers stated to have a master's degree (60.95%) and 54 a bachelor's degree (19.71%). A further 36 managers stated to have finished high school (13.14%) and 17 had a Ph.D. (6.20%). The majority of the managers studied business and economics (33.21%), followed by IT (25.91%) and engineering (24.09%).

On average, the managers participating had 15 years of work experience (SD = 8.02). They worked in organisations with an average of 727 employees (SD = 1010.27), with 71 managers (25.91%) working in small enterprises (1 to 49 employees), 99 (36.13%) in medium enterprises (50 to 499 employees) and 104 (37.96%) in large enterprises (more than 500 employees). The majority of the managers stated to work in Finance (34.31%), followed by telecommunications (25.91%) and the public sector (8.76%).

3.2 Variables Collected

In this section, all variables (criterion variables, predictors and demographic variables) are explained that were collected for testing the hypotheses. Because of Luxembourg's multicultural environment, where more than 170 nationalities can be found (Luxembourg for Finance and Luxembourg for Business, 2015), all measuring instruments were available in German, English and French.

3.2.1 Rising and falling competence requirements

The rising and falling competence requirements were calculated for the classes of professional-methodical and social-communicative competences. In a first step, the participants were asked to answer the following open questions: what competences do you need in your position today in order to meet the current requirements? What competences will be necessary in your position in the future to successfully meet the demand for adaptation in the next 3–5 years? In addition, participants were to weight the importance of the named competences using a percentage rate so that the sum adds up to 100%. The participants' answers represent competence manifestations (e.g. learning Chinese), which were allocated to competences (e.g. multilingualism) using a coding scheme (Mühlbacher, 2007), which in turn were grouped into competence classes (e.g. social-communicative). In order to address the basal leader-manager differentiation (Toor, 2011) properly, this study mainly focuses on the professional-methodical and social-communicative competences.

Subsequently, the competence requirements were determined through the difference between current and future competences. For calculating rising demand for professional-methodical or social-communicative competences, exclusively positive values (0 to 100) were then used, while for calculating falling demand only negative values (−100 to 0) were taken into consideration. The advantage of this open approach is that participants were able to answer freely and thus sheltered from potential interference through pre-formulated answering options. Due to the open approach, a reliability analysis by means of Cronbach's Alpha was not possible. Descriptive statistics showed the following means and standard deviations for the criterion variables:

- rising demand for professional-methodical competences: M = 16.71; SD = 17.36;
- falling demand for professional-methodical competences: M = −21.87; SD = 20.85;
- rising demand for social-communicative competences: M = 7.15; SD = 10.52;
- falling demand for social-communicative competences: M = −10.47; SD = 12.59.

3.2.2 General self-efficacy

In order to measure general self-efficacy, a questionnaire designed by Schwarzer and Jerusalem (1995) was used. This is a well-established measuring instrument with 10 items, which had already been tested in several countries and cultural spheres (e.g. Scholz et al., 2002). The items include statements relating to the successful accomplishment of general tasks, such as "If a problem approaches, I usually have several ideas how to solve it" or "Whatever happens, I will manage". It is a 4-point Likert scale with a Cronbach Alpha of $\alpha = 0.85$, which is satisfactory (Bortz and Döring, 2006). The participants achieved a mean of 3.36 (SD = 0.38) and the test values were in a range from 2.40 to 4. The questionnaire had already been translated into German (Schwarzer and Jerusalem, 1999) and French (Dumont et al., 2000).

3.2.3 Resistance to change

In order to measure resistance to change, a questionnaire designed by Oreg (2003) was used. This is a well-established measuring instrument with 17 items, which had been tested in a large-scale study in more than 19 countries (e.g., Oreg et al., 2008). The items include statements on the perception of changes such as "I generally think changes are negative" or "If I am informed about changes to plans, I feel more tension". It is a 6-point Likert scale with a Cronbach Alpha of $\alpha = 0.81$, which is satisfactory (Bortz and Döring, 2006). The participants achieved a mean of 2.71 (SD = 0.52) and the test values were in a range from 1.35 to 4. The questionnaire had already been translated into German (Oreg et al., 2008). For translation into French, an experienced translator was hired.

3.2.4 Demographic variables

Data on the industry (e.g. finance, public sector) and relating to the number of employees in the organisation were recorded. As in other studies (e.g. Schminke et al., 2002), the figures given on the number of employees were log-transformed in order to reduce skewness. Moreover, the participants' age, sex, nationality, mother tongue, educational achievement, field of studies, position in the organisation and current line of work were recorded.

3.3 Data Collection and Analysis

The data were collected by means of an online survey, which is a typical approach for quantitative research designs (Frippiat and Marquis, 2010, p. 285). The survey was compiled using LimeSurvey 1.92 (`www.limesurvey.org`), an open-source survey tool, and included the two open questions for recording competences, the two standardised measuring instruments to record general self-efficacy and resistance to change, as well as the demographic variables. The questionnaire was offered in German, English and French and it took 15–20 minutes to fill in. After completion, the data were imported into an Excel file and analysed using IBM SPSS Statistics 20.

For testing the hypotheses, multiple regression models (Cohen et al., 2013) were calculated. The influence of the demographic variables of age, sex, educational achievement and experience as a manager was controlled. As Type I and Type II errors become more probable if certain requirements of regression analyses are violated (e.g. Williams et al., 2013), these were tested in the present study. As all requirements were met (e.g. suitable sample size, outliers, multicollinearity), the multiple regression models were calculated without problems.

4 EMPIRICAL RESULTS

The results section consists of two parts. In a first step, the results of the coding procedure (Mühlbacher, 2007) will be displayed in the form of a competence profile encompassing the identified competences. Then, the result of the multiple regression model is presented, by means of which the influence of personality traits on falling and rising competence requirements was tested.

4.1 Professional-methodical and Social-communicative Competences

The participants in the study were asked in two open questions to list competences that are on the one hand relevant for their current job and on the other hand will become so in the future. The participants' answers were then allocated to a total of 14 professional-methodical and 9 social-communicative competences. The class of professional-methodical competences includes solution-oriented and job-related behaviours and abilities. In Tab. 1, the means of all current and future professional-methodical competences are shown.

The class of social-communicative competences refers to abilities that are required for social interaction. In Tab. 2, the means of all current and future social-communicative competences are shown.

Calculating the difference between current and future professional-methodical competences gives the individual demand for professional-methodical competences for each participant. For calculating the individual rising demand for professional-methodical competences, only positive values (0 to 65) are taken into account. Similarly, for calculating the individual falling demand for professional-methodical competences, only the negative values (−85 to 0) are used. The averaged values then become the criterion variables of the rising demand for professional-methodical competences (M = 16.71; SD = 17.36) and the falling demand for professional-methodical competences (M = −21.87; SD = 20.85). For the social-communicative competence class the rising (M = 7.15; SD = 10.52) and falling (M = −10.47; SD = 12.59) demand was calculated in the same manner.

4.2 Testing the Hypotheses

In this part of the results section, all the main results that are required to find an answer to the hypotheses are listed. The correlation table (Tab. 5 in the annex) contains all variables relevant to the study and points out any significant connections. A significantly negative correlation can be found between the rising demand for professional-methodical competences and the falling demand for social-communicative competences ($r = -0.42$, $p < 0.01$). At the same time, it can be seen that a rising demand for social-communicative competences shows a significantly negative correlation with the falling demand for professional-methodical competences ($r = -0.38$, $p < 0.01$). Both findings suggest that managers who reported a high demand for change in one of the two competence classes also perceived a high demand for change in the other.

It also becomes apparent that general self-efficacy positively correlates with a falling demand for professional-methodical competences ($r = 0.16$, $p < 0.05$). This proves a connection between a personality trait and the competence requirements. As expected, there is furthermore a negative correlation between the two personality traits general self-efficacy and resistance to change ($r = 0.39$, $p < 0.01$), which has also been detected in earlier studies (e.g. Armenakis et al., 1993). As regards the demographic variables, it can be seen that age is negatively correlated with general self-efficacy ($r = -0.19$, $p < 0.01$). Thus, the younger a manager is, the higher his degree of general self-efficacy tends to be.

Tab. 1: Professional-methodical competences identified

Competences	Time	M	SD
Accounting / Financial management	Current	5.43	11.01
	Future	2.93	9.04
Analytical thinking	Current	3.11	8.48
	Future	1.82	6.72
Corporate development	Current	2.86	7.34
	Future	2.95	8.13
Change management	Current	2.23	7.13
	Future	4.39	12.24
Decision-making ability	Current	1.80	6.40
	Future	1.35	5.75
Personnel management	Current	1.26	5.44
	Future	1.13	4.82
IT knowledge	Current	6.88	15.58
	Future	8.47	18.13
Legal competence	Current	2.61	8.70
	Future	1.86	7.41
Marketing / Sales	Current	2.95	8.01
	Future	2.97	9.69
Professional knowledge	Current	4.08	10.84
	Future	2.47	10.06
Project management	Current	2.17	6.29
	Future	1.24	5.99
Risk management	Current	1.03	3.99
	Future	0.55	3.56
Strategic management	Current	5.32	9.74
	Future	6.52	13.35
Technical understanding	Current	3.45	9.48
	Future	3.03	10.79

Tab. 2: Social-communicative competences identified

Competences	Time	M	SD
Communication	Current	3.46	7.29
	Future	3.13	8.15
Conflict management	Current	0.89	3.82
	Future	0.95	4.69
Customer relationship management	Current	1.81	6.53
	Future	1.93	7.59
Active listening	Current	1.05	3.98
	Future	0.53	3.19
Multilingualism	Current	5.52	9.23
	Future	2.76	6.95
Negotiating skills	Current	1.81	6.11
	Future	1.65	6.45
Network skills	Current	1.73	5.99
	Future	1.66	6.42
Teamwork	Current	1.00	4.91
	Future	0.90	4.20
Reporting	Current	1.15	4.39
	Future	0.76	4.95

As expected, the age of the managers correlates positively with their experience ($r = 0.67$, $p < 0.01$). In addition, the number of employees in the organisation shows a positive correlation with the falling demand for social-communicative competences ($r = 0.16$, $p < 0.05$) and a negative correlation with the rising demand for social-communicative competences ($r = -0.22$, $p < 0.01$). In larger organisations, therefore, social-communicative competences were rated as less important. Moreover, a negative correlation between the number of employees and general self-efficacy ($r = -0.15$, $p < 0.05$) was detected.

Tab. 3: Multiple regression model to predict rising and falling demand for professional-methodical competences

	Rising demand for professional-methodical competences[a]			**Falling demand for professional-methodical competences**[b]		
Predictors	β	R^2	ΔR^2	β	R^2	ΔR^2
Step 1:		0.01	0.01		0.03	0.03
Age in years	−0.11			−0.16		
Sex	−0.01			0.04		
Educational achievement	−0.06			−0.07		
Experience as a manager in years	0.12			−0.03		
Step 2:		0.01	0.00		0.09	0.06**
Age in years	−0.10			−0.12		
Sex	−0.01			0.07		
Educational achievement	−0.06			−0.11		
Experience as a manager in years	0.12			−0.08		
General self-efficacy	0.02			0.26**		
Resistance to change	0.01			0.21*		

Notes: [a]$n = 150$, [b]$n = 161$, *$p < 0.05$, **$p < 0.01$.

Calculating the multiple regression model showed that general self-efficacy ($\beta = 0.26$, $p < 0.01$) and resistance to change ($\beta = 0.21$, $p < 0.05$), with an R^2 of 0.09, are significant predictors of the falling demand for professional-methodical competences (Tab. 3). In contrast, it can be seen that the rising demand for professional-methodical competences cannot significantly be predicted by either general self-efficacy ($\beta = 0.02$, $p = 0.88$) or resistance to change ($\beta = 0.01$, $p = 0.90$). The control variables of age, sex, educational achievement and experience as a manager do not play any role at all.

Tab. 4: Multiple regression model to predict the rising and falling demand for social-communicative competences

	Rising demand for social-communicative competences[a]			**Falling demand for social-communicative competences**[b]		
Predictors	β	R^2	ΔR^2	β	R^2	ΔR^2
Step 1:		0.04	0.04		0.01	0.01
Age in years	−0.16			0.02		
Sex	−0.09			0.05		
Educational achievement	−0.09			0.10		
Experience as a manager in years	0.21			−0.03		
Step 2:		0.04	0.01		0.05	0.04*
Age in years	−0.19			−0.03		
Sex	−0.11			0.06		
Educational achievement	−0.09			0.11		
Experience as a manager in years	0.23*			−0.01		
General self-efficacy	−0.08			−0.20*		
Resistance to change	−0.07			−0.19*		

Notes: [a]$n = 155$, [b]$n = 200$, *$p < 0.05$.

A similar result emerged when calculating the regression model to predict rising and falling demand for social-communicative competences (Tab. 4). Again, it becomes apparent that general self-efficacy ($\beta = -0.20$, $p < 0.05$) and resistance to change ($\beta = -0.19$, $p < 0.05$), with an R^2 of 0.05, are significant predictors of the falling demand for social-communicative competences. In contrast, it can be seen that the rising demand for social-communicative competences cannot significantly be predicted by either general self-efficacy ($\beta = -0.08$, $p = 0.37$) or resistance to change ($\beta = -0.07$, $p = 0.41$). Only experience as a manager predicts the rising demand for social-communicative competences ($\beta = 0.23$, $p < 0.05$). A possible explanation might be that managers with increasing work experience are more likely to be found in top or upper management and in this position have to communicate with a larger number of stakeholders. The other control variables – age, sex, and educational achievement – remained immaterial.

It thus becomes apparent that both in the case of professional-methodical and social-communicative competences it is falling competence requirements that are predicted by the two personality traits. This suggests that the two changes here are very different, with different underlying dispositions, and the quality of the change therefore plays an important part. The falling demand for professional-methodical and social-communicative competences is in addition influenced by the exact opposite form of general self-efficacy and resistance to change.

5 DISCUSSION

It was the aim of this study to identify predictors of rising and falling demand for professional-methodical and social-communicative competences – especially against the background of the much-used leader-manager differentiation. Based on the literature, particularly the influence of two personality traits, general self-efficacy and resistance to change, was analysed. The results of the multiple regression models have shown that the two personality traits predict the competence requirements, but always only falling and not rising demand for professional-methodical and social-communicative competences. Therefore, hypotheses 1 and 2 were only confirmed for falling competence requirements. Furthermore, it was shown that the predictors influenced the falling demand for the two competence classes in exactly opposite directions. On the one hand, executives (= leaders) with a high level of general self-efficacy and resistance to change perceive a falling demand for professional-methodical competences. On the other hand, executives (= managers) with a low level of general self-efficacy and resistance to change report falling demand for social-communicative competences.

As falling and rising competence requirements rest on different personality traits, it can be argued that there are two different forms or types of change connected to two different change personalities, leaders and managers (Yukl and Lepsinger, 2005, p. 361). According to this, fundamental differences between managers and leaders can be found deep in their psyche or personality (Zaleznik, 1977). This underlines the complexity of the many-faceted phenomenon of "change", much covered in the literature, which the people involved can perceive very differently depending on very different characteristics. Caldwell et al. (2004), for instance, in their study discuss the importance of the extent of changes and whether these are to be interpreted as useful or threatening. Compared to a change in small steps, a massive change has a much greater potential to disturb the sensitive balance between the requirements and one's own competences. The expected risks (e.g. loss of control) compared to the desired advantages of a change (e.g. better chances in the labour market) thus reflect a negative and a positive focus (Oreg et al., 2011).

Rising and falling competence requirements can also be evaluated according to different characteristics. This indicates that the quality of changes is very important and that people contemplate what consequences change might have for them (Brockner and Wiesenfeld, 1996). Assessing changes such as the future competence requirements can have both work-related (e.g. for work performance or behaviour) and personal consequences (e.g. for personal development or health) (an overview of potential consequences can be found in Oreg et al., 2011).

How changes are perceived is hence a very subjective assessment and strongly depends on one's own self-concept. Some authors even argue that the self-concept is always involved when people assess their own competences or a future scenario (Crocker and Canevello, 2012). In order to be able to interpret one's own environment better, people take recourse to their experiences and knowledge about themselves, which are often formulated in a theory of the self (Oyserman et al., 2012). As the variables collected are self-appraisals and therefore cognitive variables, the theory of cognitive dissonance (Festinger, 1957), with its focus on cognitive aspects of the self, and particularly the self-affirmation theory (Steele, 1988) can be used for interpreting the results.

If a manager has the impression that his or her current competences strongly diverge from the competences required in the future, this can result in cognitive dissonance. In this specific case, this implies a departure from professional-methodical competences of leaders (Lunenburg, 2011), who, although they are trying to break new ground, run the risk of getting lost in unknown territory due to a lack of pertinent knowledge. On the other hand, managers unfortunately often deal with crises by perceivably reducing the social-communicative component (Daft, 2014), which results in additional uncertainty and disorientation of the employees. A certain change, such as rising or falling competence requirements and their consequences, can so be perceived as negative, damaging or threatening, depending on the extent of the cognitive dissonance produced. The theory of cognitive dissonance, however, also postulates that people do not simply passively remain in a state of cognitive dissonance, but attempt to resolve it (Silvia and Gendolla, 2001). Managers that assess their own competences as unsuitable to tackle future challenges are therefore eager to maintain a positive self-image and to reduce the dissonance they feel (Nail et al., 2004).

Self-affirmation is a mechanism to reduce dissonance which is intended to re-interpret changes that otherwise are a psychological threat assailing a person's identity (Cohen and Sherman, 2014). Reporting future competences that do not match his or her own would endanger the self-image of an effective manager. In order to protect themselves, it is therefore conceivable that managers who excel in professional-methodical competences see a falling demand for social-communicative competences. By focusing on one's own existing strengths, self-affirmation thus acts as a buffer against a potential threat to the self-image. By explicitly devaluing a certain competence class (falling competence requirements), managers are able to newly define success and orientate this towards their own strengths. Consequently, managers who have problems in communicating with clients will possibly rather emphasise their professional competences in order to compensate for this perceived weakness. This perceived inconsistency is trivialised (Wakslak and Trope, 2009) by explicitly devaluating a certain competence class and so separating the threat from the self-image. Rising and falling competence requirements can thus be interpreted as the result of a self-affirmation technique with the aim to reduce dissonance.

6 CONCLUSION AND OUTLOOK

This paper combines competence research with psychological literature and adds further insights into future competence requirements. The insight that personality traits, which are also reflected in the self-selected role perception, are connected with the assessment of competence requirements, however, also has several practical implications. First, organizations have a strong interest in accurately identifying competences that enable their executives to be successful in the future and act in a self-organised manner, even in unforeseeable situations. A comprehensive competence management system often serves as the "basis for effective recruitment, selection, and development of high-performing managers and employees" (Bücker and Poutsma, 2010, p. 832). However, as the findings of this work show, factors such as personality traits might affect the accuracy of competence assessments. Especially as the critical incident technique, which aims to identify critical situations in the past from which competences can be inferred, is still one of the most commonly employed approaches to analyse competences. To create competence profiles for core staff employees, managers, experts and project managers (in case of a professional and project management career path) HR or Learning and Development experts are thus often interviewing a handful of higher ranked managers. However, the perception of managers regarding their competence requirements can be distorted in the way that their level of general self-efficacy and resistance to change result in a devaluation of either professional-methodical or social-communicative competences. Personality traits should thus be taken into account when assessing competences by selecting a variety of different managers. As an example, to create the competence profile of a vice president, HR should not only conduct interviews with extrovert, HR-friendly vice presidents but also with the more reserved ones. In this sense, it can be argued that the inclusion of personality traits may increase the objectivity of competence assessment methods.

Second, the findings underpinning the manager-leader distinction in terms of psychological dispositions and preferred competence classes can be interesting for the design of a career path model and appropriate training measures. As the role of a leader includes challenging the status quo, innovating, and focusing on people and is thus fundamentally different from the role of a manager who relies on control, creates rules, and uses formal authority (Bennis, 1989), it could be argued that HR experts should design separate career paths. In the career path for managers, participants receive the opportunity to further develop competences such as time management, project management, and organizational skills. Instead, the career path for leaders could include topics such as strategic thinking and transformational leadership style. As both roles incorporate opposite responsibilities and skills they could act as a team with complementary competences.

As a third practical implication, the findings reflect the difficulty to identify so called "change leaders". Some scholars argue that organizations, which are planning to undergo change, should rely on dispositional factors such as resistance to change in order to create readiness profiles and identify change agents (Vakola, 2013). However, the current study showed that, independently of their level of resistance to change, both – leaders and managers – perceived competence requirements to change. The quality of the perceived change (falling demand of social-communicative or methodical-professional competences) played an important role to them. On the other hand, the conclusion that executives with a high level of resistance to change are not perceiving any change would be incorrect. Therefore, individual readiness profiles based on dispositional traits should not be used as a decision making tool or basis for a training programme.

The present study has identified two predictors of future competence requirements and in several respects shows the limits of rational decision-making. On the one hand, it was shown that the quality of change plays an essential part, as rising or falling competence requirements are determined by different personality traits. The subjective assessment of risks and advantages of changes, as well as their expected consequences, are taken into account in decision-making, as is people's own self-concept. Self-affirmation in the form of explicit devaluation of certain competence classes is therefore used to release the tension induced by cognitive dissonance. More importantly, the present study has discovered a new path for future research by demonstrating that the perception of which competences will be relevant in the future does not exist in a "void", but is partly based on psychological predispositions.

Future studies could test the influence of additional personality traits, such as internal locus of control (Judge et al., 1998), as predictors of competence requirements. Another objective of further research might be to identify specific predictors of rising competence requirements. Using a qualitative research design, it could be analysed what exactly the difference between the assessment of rising and falling competence requirements is and which main characteristics (Oreg et al., 2011) play the most important part.

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8 ANNEX

Tab. 5: Descriptive statistics and intercorrelations of study variables

Variables	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Fd. p-m	−21.87	20.85	1								
2. Rd. p-m	16.71	17.36	a	1							
3. Fd. s-c	−10.47	12.59	0.15	−0.42**	1						
4. Rd. s-c	7.15	10.52	−0.38**	0.13	a	1					
5. GS	3.36	0.38	0.16*	0.03	−0.11	0.00	1				
6. RtC	2.71	0.52	0.09	0.00	−0.10	−0.05	−0.39**	1			
7. Age	49.30	6.99	−0.15	−0.04	0.00	−0.04	−0.19**	0.05	1		
8. Exp	15.36	7.87	−0.13	0.04	0.00	0.07	−0.04	−0.02	0.67**	1	
9. Emp	5.26	2.02	0.10	−0.10	0.16*	−0.22**	−0.15*	0.11	−0.03	−0.12	1

Notes: *$p < 0.05$, **$p < 0.01$, a = can not be computed, Fd. p-m = Falling demand for professional-methodical competences, Rd. p-m = Rising demand for professional-methodical competences, Fd. s-c = Falling demand for social-communicative competences, Rd. s-c = Rising demand for social-communicative competences, GS = General self-efficacy, RtC = Resistance to change, Age = Age in years, Exp = Experience as a manager in years, Emp = Number of employees (log-transformed).

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THE FINANCIAL ACCELERATOR IN EUROPE AFTER THE FINANCIAL CRISIS

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EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 4 Issue 2
ISSN 2336-6494
www.ejobsat.com

ABSTRACT

This paper investigates the mechanism of a financial accelerator. In particular, it examines the procyclicality of credit margins in Europe after the financial crisis, with an additional split into small, medium and large-sized banks. The empirical analysis is in contrast with contemporary authors because it approves that the financial accelerator is not present on the European market after the financial crisis. It could be caused by multiple factors, for example structural changes during the financial crisis, a change in the behaviour of commercial banks or extremely low interest rates. We tested our hypothesis on a dataset that consists of a data panel with annual data for the period 1998–2015 and includes 2,489 banks from 36 European countries from the Bankscope database. We also provide robust empirical proof that such behaviour was not occurring during the financial crisis or after the financial crisis in the European banking system.

KEY WORDS

credit cycle, financial accelerator, interest margin

JEL CODES

C23, E51, G21

1 INTRODUCTION

The financial accelerator theory, which originated in the 1990s, was described in the studies of Bernanke and Gertler (1989) and Bernanke et al. (1996). Kiyotaki and Moore (1997) also contributed to the financial accelerator theory and procyclical change in the value of collateral assets. The financial accelerator was empirically tested before the financial crisis and after a financial crisis and confirmed in the USA (Aliaga-Díaz and Olivero, 2010), in Turkey (Turgutlu, 2010) and in Europe (Altunbaş et al., 2016). There is general agreement that the financial accelerator does not exist after a financial crisis. Our paper follows these studies

BAKOVÁ, Klára. 2018. The Financial Accelerator in Europe after the Financial Crisis. *European Journal of Business Science and Technology*, 4 (2): 143–155. ISSN 2336-6494,
DOI http://dx.doi.org/10.11118/ejobsat.v4i2.136.

and contributes to the current theory of the financial accelerator, which helps to explain the scale and persistence of the business cycle.

The methodology was based on the study of the behaviour of banks' price-cost margins as a proxy for the external finance premium that banks charge to firms. They identified the procyclical impact of credit margins in their results. Procyclical margins make bank loans more expensive during economic downturns and can cause the deepening of the business cycle.

The contribution of this paper is to identify the varied functioning of the financial accelerator after the financial crisis, with an additional split into small, large and medium-sized banks. The research is focused on the procyclical behaviour of interest margins on the European market. It influences the ability of borrowers to obtain loans from external sources. This paper provides robust empirical proof that such behaviour was not occurring in the European banking market during the financial crisis or after the financial crisis. In particular, it examines the relationship between credit margins, the economic cycle and other determinants.

The paper is organised as follows. Section 2 contains the literature review. A detailed overview of methods and data is provided in Sections 3. Section 4 presents the results of the econometric models and Section 5 presents a robustness analysis. Section 6 offers concluding remarks.

2 LITERATURE REVIEW

There is an extensive review of literature on the FA, especially during the 1990s. A financial accelerator can be described as a mechanism effect when the effect of relatively small impulses could lead to a persistent fluctuation in the economy due to the role of an endogenously procyclical credit margin in financial markets (Bernanke et al., 1996 and 1998). Due to imperfections in the credit market, the ability of borrowers to obtain credit from external sources is procyclically affected if the economy is hit by a shock that affects the net worth of borrowers (Bernanke and Gertler, 1989; Bernanke et al., 1996 and 1998). The effect may also have procyclical interaction between credit limits and asset prices. Durable assets are presented as factors of production, but also as collateral for loans (Kiyotaki and Moore, 1997).

We follow studies of the financial accelerator in the USA (Aliaga-Díaz and Olivero, 2010), in Turkey (Turgutlu, 2010) and in Europe (Altunbaş et al., 2016). These studies tested the existence of the financial accelerator on the case of cyclical banks' price-cost margins as the dependent variable. Therefore, we provide a brief overview about the history of the financial accelerator as well as the determinants of bank margins.

2.1 History of the Financial Accelerator

The financial accelerator theory is part of the theoretical and empirical literature about credit-market imperfections. The origin of the theory was in 1989 when Bernanke and Gertler (1989) and then Bernanke et al. (1996) studied how shocks may be amplified by endogenous developments in the financial markets. Bernanke and Gertler (1989) identified a condition of the borrower's balance sheet as a source of output dynamics. Their concept analyses the mechanism of net worth, which has an impact on agency costs. In short, when, for example, a positive shock occurs, the higher borrower net worth reduces the agency costs, so he can pay a lower premium on external finance because the risk of bankruptcy is lower. It causes an increase in investment. This mechanism amplifies the upturn and a relatively small shock could lead to a persistent shock in the economy.

The question of how credit constraints interact with aggregate economic activity over the business cycle was also studied by Kiyotaki and Moore (1997). They focused on amplifying shocks, the transfer through other sectors and their persistence. As an amplifier of business fluctuations, they identified the prices of the assets used as collateral. It interacts with an endogenously defined credit limit and can lead to a large and persistent shock. The theory is basically similar to that of Bernanke and Gertler (1989), but in this case, the change in net worth is due to the availability of credit, not the cost of credit.

In the paper "flight to quality", Bernanke et al. (1996), focused on the beginning position of borrowers. They suggest that borrowers facing relatively high agency costs in credit markets will bear the brunt of an economic downturn. When a shock occurs, they reduce spending, production, and investment and it worsens the effects of recessionary shocks. For high-agency-cost borrowers, small and medium-sized firms with a worse balance sheet are mainly considered. Their procyclical variability is higher and they should react earlier.

The financial accelerator has been studied in recent empirical works. Some of them were focused on the development of the bank interest margin. They assumed the Bernanke and Gertler hypothesis (1989), that the bank credit margin is a proxy for premium external funds, a key element of the model. This margin behaves procyclically and makes bank loans more expensive during economic downturns compared to an economy with constant margins.

The financial accelerator hypothesis was confirmed by Aliaga-Díaz and Olivero (2010) for US banks in the period 1984–2005. Turgutlu (2010) tested the theory in Turkey in the period 2001–2008. The impact of the financial accelerator has also been confirmed. Altunbaş et al. (2016) then studied the European banking system in the period 1989–2012. They found that margins in the European banking system are cyclical with respect to the output gap and total bank loans. Pancrazi et al. (2016) confirmed the existence of the financial accelerator mechanism, but with the addition that it is stronger than originally assessed.

The financial accelerator could be changed after the financial crisis. The impact of a lack of liquidity and a change in asset quality was different because of the heterogeneity in Europe (Fratzscher, 2012). The impact of the banking market structure was also explored by Brissimis and Delis (2010), who provided evidence that heterogeneity observed on the bank level can affect the response to changes in monetary policy. The heterogeneity can be observed through the banking channel before a financial crisis and after a financial crisis (Heryán and Tzeremes, 2017). The changing conditions in the economy also brought changes in monetary policy. The ECB decreased interest rates to a historical minimum. They also responded by increasing credit support and quantitative easing (ECB, 2010).

2.2 Determinants of Interest Margins

There are many studies focused on interest margins and their determinants. For example, Kapounek et al. (2017) present the development of interest margins spread as the most important indicator of credit growth. Higher interest rates are therefore associated with a lower supply of loans. Models for the interest margin spread are based on a model proposed by Ho and Saunders (1981). The model assumes banks to be risk averse and that their main contribution is to collect deposits and provide loans. The bank margin is influenced by the uncertainty of the transaction, the structure of the banking market, the degree of banking capitalization and the volatility of interest rates. The model was subsequently modified and supplemented, for example, by the possibility of portfolio diversification on the performance of the banking market (McShane and Sharpe, 1985) or the role of operating costs (Maudos and de Guevara, 2004).

Differences in interest margins and bank profitability are reflected in varying determinants, such as bank characteristics, macroeconomic conditions, regulation, and several legal and institutional indicators, as shown by Demirgüç-Kunt and Huizinga (1999) in their study.

The evolution of interest margins is divided according to the influence of monetary policy and banking regulation, the risks of firms that act as current or potential borrowers and the characteristics of the bank.

The influence of monetary policy and banking regulation is important to mention because the financial crisis and its consequences have led to changes in regulatory policy because the regulatory framework then proved to be inadequate for achieving financial stability. It was necessary to include unrecovered dimensions like liquidity and the risk of the transmission of shock resulting from various sources (Bank of England, 2011). The existing regulatory framework was also inadequate because it failed to prevent banks from over-risking (Dewatripont et al., 2010). Many central banks have not previously embedded the banking system into their models. They have not seen it as a potential source of friction in the transmission mechanism of monetary policy (Gambacorta and Marques-Ibanez, 2011). A new regulatory framework has been introduced, which is a set of macroprudential regulations to reduce systemic risks. A key element is the creation of a reserve for the accumulation of capital at a time when banks are doing well and the economy is growing and vice versa (Cincotti et al., 2012).

In case of a tightening of monetary policy, banks should respond by reducing the volume of credit, which also affects the amount of the credit margin. This mechanism and its functioning are influenced by the central bank's transmission mechanisms, which can operate in different ways. The change in the market interest rate due to the change in official interest rates is influenced by the confidence and expectations of future developments (Bank of England, 1999), the transparency of the central bank's monetary policy (Papadamou et al., 2015), credibility which increases the efficiency of the transmission mechanism (Levieuge et al., 2018), and the bank's access to alternative financing (Fungáčová et al., 2014). Access to alternative sources is determined by the characteristics of banks such as capital, capitalization and liquidity, but also the structure of the banking sector and the market power of individual financial institutions (Gambacorta, 2005; Matousek and Sarantis, 2009). Sanfilippo-Azofra et al. (2018) show that banks do not respond to monetary policy in countries with a less developed financial system. In countries with developed financial systems, the efficiency of the banking channel is proven after the financial crisis.

During the financial crisis, interest rates were almost zero and it caused the low efficiency of the banking channel in the transmission of monetary policy. The ability of monetary policy to affect banks' lending activity became very ineffective. At low-interest rates, a bank's expectations about future interest rates are changing significantly (Swanson and Williams, 2014; Apergis and Christou, 2015). Other studies suggest that the banking channel is less efficient in banking systems with large, more liquid and more profitable banks (Matousek and Sarantis, 2009; Gunji and Yuan, 2010; Hou and Wang, 2013). The negative impact of very low-interest rates on the profitability of banks' credit assets by reducing interest rate margins was also confirmed by Borio and Gambacorta (2017). Then Dell'Ariccia and Marquez (2013) also warn that it may have a negative impact on the bank's risk.

The literature bears witness to many papers defining factors which could influence a bank's activities and therefore bank loans. Kučerová and Kapounek (2015) identified the main determinants of bank lending activities in the sample of EU countries. They confirmed the significant impact of macroeconomic shocks, banking controls and institutional variables on European lending activities. Chakraborty and Ray (2006) also show similar results – the level of per capita GDP and investments is higher under the bank-based system compared to the market-based system.

Interest rate margins are also affected by the credit cycle. The lower willingness of banks to borrow during a crisis is caused by higher economic uncertainty, lower liquidity availability on interbank markets, and lower solvency due to weaker balances (Adams-Kane et al., 2015). Changes in credit capacity affect the activity of firms dependent on external financing. As mentioned above, banks also respond to the tightening of monetary policy (Kashyap and Stein (1995). Especially small and less liquid banks with low securities are more responsive to monetary policy shocks (Kashyap and Stein, 2000). This effect is amplified by endogenous changes in optimism and pessimism (animal spirits; see De Grauwe and Macchiarelli, 2015). Based on these changes, it is possible to observe the paradox of financial instability which was first presented by Borio and Drehmann (2009) and Borio (2011). The instability of the economy is paradoxically growing the most when an economy is at its peak. It's caused by the procyclicality of bank lending and firms' access to funds. Banks reduce credit standards in times of economic growth (Jiménez and Saurina, 2006).

Banks can also be influenced by asset price developments, which are used as collateral, and their reduction is accompanied by a reduction in the availability of credit to those using assets in this way (Jiménez and Saurina, 2006). Carvalho et al. (2015) identified bank distress in connection with a fall in share valuation and subsequent losses. These lead to a reduction in the investments of borrowers with the strongest credit relations with banks.

When examining the determinants of interest margins, the impact of the risk channel and the riskiness of the companies cannot be omitted. There were also changes in this sector after the financial crisis. A new risk channel has been defined which suggests that monetary policy can determine the level of risk in the economy. Too low-interest rates for a long time can cause systemic risk accumulation in the financial sector. This results in financial imbalances caused by reduced aversion to risk from banks and other investors (Borio and Zhu, 2012). Knowledge about the risk channel is still limited, but evidence of the risk channel has been proven in the Eurozone (Maddaloni and Peydró, 2011; Cappiello et al., 2010) or in the US investment-banking sector (Adrian and Shin, 2010). Altunbaş et al. (2010) also consider bank risk with the classic indicators (size, liquidity and capitalization) used to assess the ability and willingness of the bank to provide loans. In particular, it found that banks characterized by lower expected default rates are able to offer a larger amount of credit and to better isolate the supply of loans from monetary policy changes. Banks that include corporate risk are also affected by information asymmetries (Duran and Lozano-Vivas, 2015) followed by moral hazard (Antzoulatos and Tsoumas, 2014). Cincotti et al. (2012) confirmed that the state of affairs also affected the level of interest rates.

The last part of credit margins determinants includes bank characteristics. Gambacorta and Marques-Ibanez (2011) identified the characteristics of banks that have a significant impact on banks' credit activity. According to their results, the decline in credit activity during the crisis was strongest in banks with lower core capital, increased dependence on market liquidity and non-interest income sources. Markovic (2006) includes bank capital because more capitalized banks are more isolated from changes in monetary policy or other shocks, without changing credit activity. Similar results were shown by Borio and Gambacorta (2017).

Important determinants of interest rates and the ability to provide loans also include size, capitalization, efficiency and the liquidity of the bank (Guiso et al., 2002). Altunbaş et al. (2009) and Apergis and Christou (2015) place emphasis on characteristics such as liquidity and capitalization. The assumption that large, liquid and well-capitalized banks have more opportunities to expand their loan portfolio and are less sensitive to monetary policy shocks and policy changes to the interest rate has been confirmed by several other authors (Gambacorta and Mistrulli, 2004; Gambacorta, 2005; Jorge, 2009). We can also mention determinants like management efficiency, which can reduce costs, followed by interest margins (Angbazo, 1997; Hawtrey and Liang, 2008).

We include bank liquidity in our model because holding more liquid assets increases additional costs (Ho and Saunders, 1981). We also include bank specialization because we assume that banks more specialized in deposit react in a relatively less elastic manner and banks are able to separate money from exogenous economic shocks (Berlin and Mester, 1999). As another determinant, we include credit quality. If there is a higher credit default, banks need to increase their credit margins to compensate for the loss (Maudos and de Guevara, 2004). The last banking characteristic is capital because more capitalized banks can charge a higher margin, if we assume that liabilities are cheaper than equity. It can be caused due to tax optimization (Lown and Peristiani, 1996; Jorge, 2009; Adrian and Shin, 2010).

3 DATA AND METHODS

We use annual data from Bureau van Dijk – Bankscope for 2,489 banks across 36 European countries in the period 1998–2015. The Bankscope database provides detailed data including balance sheets and financial indicators of the banks. We mostly focus on bank margin and bank characteristics. We obtained data on macroeconomic fundamentals from the publicly available Eurostat database (Eurostat, 2017). The macroeconomics and institutional data set is merged with individual bank data.

Data are transformed using a chain index with a base period in 2007. The data are further adjusted for outliers in the 1% and 99% percentile. To eliminate the obliquity and accuracy of data, all data are transformed using logs. Descriptive statistics and a cross-correlation matrix are in Annex.

The financial accelerator was tested before the financial crisis and after the financial crisis, especially using interest margins. Changes in the financial market during the period 1998–2015 can have an impact on the financial accelerator, so we divide the period and then we will analyse the financial accelerator before the financial crisis and after the financial crisis. Specifically, this paper examines the relationship between interest margins, the economic cycle and other determinants. We focus on the European banking sector. Therefore, we deal with the determinants of interest margins in the economy dependent on the banking sector.

In the analysis, the panel regression model is used. Because of the specific conditions of a particular bank, a fixed-effects model is used. These specifics are not captured in the model and cannot be considered as random. Parameter estimates are calculated using the OLS method.

We assume the following regression:

$$\mathrm{IRmargins}_{i,t} = c + \sum_{m=1}^{M} \beta_1 \, \mathrm{mshocks}_{c,t} + \sum_{n=1}^{B} \beta_2 \, \mathrm{bcontrols}_{i,t} + \sum_{s=1}^{S} \beta_3 \, \mathrm{insti} + \theta_t + \mu_i + \varepsilon_{i,t} \tag{1}$$

In the equation (1), i and t are banks and time, $\mathrm{IRmargins}_{i,t}$ is the bank's net interest margin, $\mathrm{mshocks}_{c,t}$ are macroeconomics shocks in the country c and time t. It measures the business cycle through the development of GDP. GDP is the main explanatory variable, so we include it in the main model and in every sub-model. The set of variables $\mathrm{bcontrols}_{i,t}$ represents selected banking characteristics, including bank liquidity measured as a ratio of liquidity assets to total bank assets and bank specialization measured as the ratio of bank deposits to total bank assets. An additional banking characteristic is credit quality measured as a ratio of loan loss provisions to total loans. The last one is capital measured as the ratio of capital to total bank assets. The last set of variables, insti, includes determinants of the institutional environment. Finally, we include the time dummy variable, θ_t, bank fixed effects, μ_i (special characteristics with different impact for each bank), and a residual, $\varepsilon_{i,t}$.

The mechanism of the financial accelerator starts with a relatively small shock that causes a change in economic activity. Changes in economic activity are included in the model by GDP. When an adverse shock occurs, GDP decreases, it causes a slowdown in sales, a decline in cash flows and internal funds, increasing the amount that a firm must obtain from external financial resources to finance investment projects. Changes that have caused the decline in the net worth of the borrower further exert an external financial premium due to the asymmetry of information. An increase in the external financial premium due to the deterioration of the borrower's financial situation and the increase in its risk disrupts the access of businesses and households to credit. In addition, there is a reduction in the value of guarantees. It further reduces debtors' balance sheets, increases their risk, and thus reduces their ability to obtain credit. Firms are forced to reduce their investment, resulting in a negative impact on performance. The changes will also cause fluctuations in banks' credit activity, which again affects investment, expenditure and production, which in turn affects GDP. The result is an increase in the persistence of the original shock and the further deepening of the business cycle.

In the robustness analysis, we check the sensitivity of our analysis in two ways. Firstly, we included bank size criteria. Bank size, liquidity, and capitalization are the main criteria, which determine the interest margin (Guiso et al., 2002). Kapounek et al. (2017) show that the loans of large banks also depend strongly on demand factors like GDP, consumption or unemployment.

We analyse small, large and medium-sized banks (see Tab. 3) separately. We divided the model into these groups according to the percentile. The distinguishing criterion used is the indicator of the total assets of banks modified with respect to GDP to eliminate the impact of the size of the economy.

4 RESULTS

Tab. 1 presents OLS results for the bank interest margin. Our main model focuses on the interest margin, which is determined by the economic cycle, bank liquidity, specialization, bank equity and credit quality.

The results present the significant and negative effect of GDP on the interest margin. Thus, higher GDP is associated with a lower interest rate. In other words, the interest margins are higher during an economic downturn. This has a negative impact on firms, because it reduces their ability to obtain loans. It further deepen the economic downturn. We can conclude that interest margins are procyclical, so we can confirm the financial accelerator in the European banking system. Tab. 1 also presents the significant and negative effect of bank liquidity. This confirms our hypothesis of declining interest margins in liquidity growth due to the increase in the cost of holding liquid portfolios. The positive impact of capital (equity to assets) confirms the hypothesis that more capitalized banks can set higher interest margins.

On the contrary, an insignificant variable is the credit quality (loans loss reserve to gross loans), so we do not include it in further models.

In the second step, we divided the model by the period before the financial crisis (column 2), during the financial crisis (column 3) and after the financial crisis (column 4). Column 1 presents the undivided model, similarly to Tab. 1. As we mentioned, credit quality is omitted because it is not significant in the first model.

Our results show the financial accelerator is in the European banking system only until the financial crisis. Column (3) and (4) in Tab. 2 shows interest margins are determined by the business cycle, but the financial crisis changed their direction. After the financial crisis, the business cycle had a positive impact on bank interest margins. The business cycle is represented by GDP. Thus, the positive impact on bank interest margins means that when GDP grows, interest margins also increase and loans become more expensive for firms. It could reduce the growth of GDP. This is the main different between Tab. 1, where the business cycle is deepened by the negative impact of the business cycle, known as the financial accelerator.

When we compare the results of the model focusing on the period of the financial crisis (column 3) to the model after the financial crisis (column 4), we can see that the impact of GDP is higher during the financial crisis.

When we compare the results of the undivided model (column 1) to the divided model

Tab. 1: Analysis of interest margin determinants

	1	2	3	4	5	6
GDP	−0.183***	−0.225***	−0.195***	−0.106	−0.118	−0.131*
	(0.068)	(0.072)	(0.070)	(0.065)	(0.081)	(0.078)
Liquid assets to total assets		−0.030***				−0.033***
		(0.009)				(0.008)
Deposits to assets			0.220***			0.045*
			(0.032)			(0.024)
Equity to assets				0.272***		0.228***
				(0.025)		(0.027)
Loans loss reserve to gross loans					0.003	0.006
					(0.008)	(0.008)
Constant	0.849***	0.785***	0.643***	1.649***	1.021***	1.527***
	(0.026)	(0.033)	(0.021)	(0.078)	(0.051)	(0.087)
Observations	26,654	24,098	23,856	24,105	12,240	10,635
R^2	0.065	0.068	0.071	0.122	0.102	0.160
Number of banks	2,453	2,250	2,230	2,245	1,805	1,663
ll	−10,345	−7,975	−6,766	−7,615	−1,720	−741.9

Tab. 2: Financial accelerator analysed based on the period

	1998–2015	1998–2007	2007–2010	2008–2015
GDP	−0.120*	−0.240***	1.302***	0.476***
	(0.062)	(0.079)	(0.253)	(0.130)
Liquid assets to total assets	−0.029***	−0.011	−0.030	−0.022*
	(0.008)	(0.014)	(0.020)	(0.012)
Deposits to assets	0.070**	0.014	−0.120*	0.087
	(0.033)	(0.049)	(0.063)	(0.069)
Equity to assets	0.310***	0.342***	0.012	0.189***
	(0.023)	(0.036)	(0.049)	(0.032)
Constant	1.728***	1.792***	0.657***	0.974***
	(0.075)	(0.126)	(0.135)	(0.087)
Observations	23,748	9,597	3,044	11,217
R^2	0.148	0.148	0.058	0.034
Number of banks	2,219	1,560	1,612	2,061
ll	−5,488	655.3	930.6	−1,334

(columns 2–4 according to period), we can see that the impact of liquid assets and specialization is not significant throughout the period. However, the impact of bank liquidity is approximately similar to that of the original model.

5 ROBUSTNESS ANALYSIS

The results of the robustness analysis by the size of the banks shows that interest margins are procyclical only in the case of a large bank. The results are in line with the literature – large banks can better diversify, it leads to lower credit default and then lower credit costs and margins. Our robustness analysis results also confirm our previous results about liquid assets and capital, especially in the case of large banks.

Moreover, the impact of capital (equity to assets) is significant before the financial crisis and after the financial crisis and for all bank

Tab. 3: Results of robustness analysis by the size of the banks

	All banks	**Small banks**	**Medium banks**	**Large banks**
GDP	−0.120*	−0.275	−0.082	−0.187**
	(0.062)	(0.169)	(0.106)	(0.089)
Liquid assets to total assets	−0.029***	−0.009	−0.027**	−0.048***
	(0.008)	(0.014)	(0.012)	(0.014)
Deposits to assets	0.070**	0.015	0.045	0.034
	(0.033)	(0.043)	(0.043)	(0.022)
Equity to assets	0.310***	0.267***	0.352***	0.293***
	(0.023)	(0.045)	(0.037)	(0.037)
Constant	1.728***	1.295***	1.489***	1.232***
	(0.075)	(0.121)	(0.094)	(0.100)
Observations	23,748	5,860	8,818	7,438
R^2	0.148	0.161	0.157	0.175
Number of banks	2,219	632	695	595
ll	−5,488	−1,332	−2,085	−511.9

Tab. 4: Robustness analysis by country

	EU 36	**CEES**	**Eurozone**	**EU 5**
GDP	−0.120*	−0.058	0.467***	0.327**
	(0.062)	(0.160)	(0.063)	(0.157)
Liquid assets to total assets	−0.029***	−0.009	−0.044***	−0.046***
	(0.008)	(0.017)	(0.013)	(0.011)
Deposits to assets	0.070**	−0.073**	0.168**	0.130**
	(0.033)	(0.035)	(0.065)	(0.053)
Equity to assets	0.310***	0.259***	0.288***	0.279***
	(0.023)	(0.051)	(0.055)	(0.031)
Constant	1.728***	2.297***	1.294***	1.734***
	(0.075)	(0.194)	(0.152)	(0.101)
Observations	23,748	2,194	9,585	14,911
R^2	0.148	0.302	0.143	0.112
Number of banks	2,219	223	684	1,266
ll	−5,488	−456.8	374.1	−3,674

sizes. Thus, we can confirm the hypothesis that banks which are more capitalized can set higher interest margins for all banks almost independently of the size. The positive impact of bank capital is unchanged throughout.

Secondly, we check the sensitivity of our analysis according to the different groups of European countries – Central and Eastern European countries (CEES), the euro area and the 5 biggest countries (EU 5) in Europe according to GDP. Column 1 presents the undivided model, similarly to Tab. 1. The results of the robustness analysis by country confirm our previous results of the divided model. In the euro area and the 5 biggest countries, the economic cycle has a positive impact on interest margins. Therefore, we cannot prove the effectiveness of the financial accelerator.

6 DISCUSSION AND CONCLUSIONS

The contribution of this paper is to identify the varied functioning of the financial accelerator before the financial crisis and after the financial crisis and subsequently for the different sizes of banks. The paper is mainly focused on the relationship between interest margins, the economic cycle and other determinants such as bank liquidity or bank capital.

We show that our results of the first undivided model are in line with the current literature and confirm the presence of the financial accelerator in the European banking system. This means procyclical interest margins, which deepen the economic cycle. We also divided our model into 3 periods and according to this model, the financial accelerator is present in the European banking system only until the year 2007, when the financial crisis began. Consequently, economic activity has no procyclical impact on the interest margins after the financial crisis.

There are several reasons why the financial accelerator has not been proven in the European market since the financial crisis. During the crisis, there were many structural changes that led to changes in the instruments used by central banks, but also changes in the behaviour of commercial banks due to increased risk. Extremely low interest rates could have had an important impact. Banks and businesses could have played their role during the crisis. Besides the financial crisis, the banking system also weakened the transmission mechanism, due to deregulation, financial innovations and changes in bank business models. The effects on the financial accelerator may also have changes in the focus on macro-prudential policy or greater emphasis on risk measurement and understanding in the financial sector. In the context of risk control, several new institutions are also involved in monitoring systemic risk and issuing recommendations.

Finally, we presented a robustness analysis to identify the significant impact of the bank size on the financial accelerator in the European market. Our results show the presence of the financial accelerator in the European banking system only in the case of large banks. We also examined other characteristics and, for example, we can confirm the hypothesis that more capitalized banks can set higher interest margins for all banks almost independently of the size.

Then we examined the presence of the financial accelerator in different groups of countries – CEES, the euro area and the 5 biggest countries in Europe. We found a significant result in the case of the euro area and the 5 biggest countries in Europe and we did not find a procyclical impact of interest margins.

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8 ANNEX

Tab. 5: Descriptive statistics

Variable	Observations	Mean	Std. deviation	Min.	Max.
Interest margin	27,190	2.7265	10.128	−353.53	812.50
GDP	44,784	0.9242	0.1742	0.2706	1.6108
Liquid assets to total assets	24,685	0.2311	0.2233	−0.0509	1.0000
Deposits to assets	24,409	0.7981	0.1875	0.0000	1.8684
Equity to assets	24,741	0.1028	0.1204	−2.5062	1.0000
Loan loss reserve to gross loans	12,468	4.2432	6.7056	−0.3880	100.00

Tab. 6: Cross-correlation matrix

Variable	Interest margin	GD	Liquid assets to total assets	Deposits to assets	Equity to assets	Loan loss reserve to gross loans
Interest margin	1.000					
GDP	−0.131	1.000				
Liquid assets to total assets	−0.188	−0.098	1.000			
Deposits to assets	0.183	0.009	0.046	1.000		
Equity to assets	0.346	0.064	0.022	−0.130	1.000	
Loan loss reserve to gross loans	0.341	−0.039	0.130	0.053	0.162	1.000

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FACTORS INFLUENCING DIVIDEND POLICY IN BANGLADESH: SURVEY EVIDENCE FROM LISTED MANUFACTURING COMPANIES IN DHAKA STOCK EXCHANGE

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EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 4 Issue 2
ISSN 2336-6494
www.ejobsat.com

ABSTRACT

A firm considers various factors when approaching a dividend policy decision. To analyze the determinants of dividend policy in the context of Bangladesh, questionnaire survey has been done from financial decision makers of sample companies. The nonparametric test and factor analysis is used for interpreting results. The research finding exhibits that in the first stage, the economic related factor, legal constraint factor, capital market related factor, residual policy factor, capital source factor and clientele factors are considered in dividend decision making. Then in the second stage, the companies follow the preceding years' pattern of dividend payment. In the next stage, dividend decision is made mainly on the level of earnings and liquidity. The observed result reveals that present earnings and liquidity are the most likely factors for the firm in deciding the payout policy.

KEY WORDS

factor analysis, EPS, DPR, MM model, Lintner model

JEL CODES

A100, A110

1 INTRODUCTION

Over the past half-century, numerous researchers have attempted to identify different factors influencing the payment of dividends. For example, in his seminal study, Lintner (1956) reports that past dividends and current earnings are the primary determinants of current dividends and managers prefer to maintain stable dividends and make periodic adjustments toward a target payout ratio. In a recent study, Brav et al. (2005) benchmark their findings to Lintner. They found that the perceived stability of future earnings still affects dividend policy but the link between dividends and earnings is weaker. They also found that managers contin-

ISLAM, Mohammad Shahidul, and ADNAN, ATM. 2018. Factors Influencing Dividend Policy in Bangladesh: Survey Evidence from Listed Manufacturing Companies in Dhaka Stock Exchange. *European Journal of Business Science and Technology,* 4 (2): 156–173. ISSN 2336-6494, DOI http://dx.doi.org/10.11118/ejobsat.v4i2.132.

ued to make dividend decisions conservatively but that the importance of targeting the payout ratio was not as high. Dividend payers also tend to smooth dividends from year to year and alter the amount of dividends in response to permanent changes in earnings. In their review of the literature on dividend determinants since Lintner, Baker and Nofsinger (2010) concluded that managers tend to share some commonly-held beliefs about the factors that affect dividend policy. The evidence suggests that the key determinants that influence dividend policy appear to have remained fairly stable over more than 50 years. Some of the more important and consistent determinants of payout policy are the pattern of past dividends, stability of earnings or cash flows, and the level of current and expected future earnings. Such firm-specific factors appear to be first-order determinants in making dividend decisions.

Since Black (1976b) referred to the interest in dividends by shareholders and the practice of firms paying dividends as the 'dividend puzzle,' researchers have tried to understand the determinants of dividend policy. Dividend policy remains a topic of ongoing debate among financial economists (Baker and Wurgler, 2002). Although most studies focus on US firms, a growing body of evidences exists on dividend policy outside of the US. These studies generally rely on economic modeling approaches instead of obtaining direct evidence about how investors and managers behave and perceive dividends. Researchers cannot fully identify factors influencing dividend policy by merely modeling market data, but must also use interactive tools such as interviews and surveys. To resolve the dividend puzzle, Chiang et al. (2006) concluded that the cardinal thrust of academic research must turn toward learning about the motivation for making managerial decisions and the perceptions upon which this motivation is based.

The board of directors takes the dividend decision along with other financial decision. So, their consideration about dividend decision is important. The opinion of dividend decision makers is taken with survey. The survey findings reveal the factors which are considered in dividend decision. The choice of influencing factors for questionnaire survey is based on the previous studies and opinion of the corporate top level managers. We conducted this study separately (financial sector and nonfinancial sector) to identify the factors in respective sectors.

In first world economies, the payout decision has been taken very cautiously by both investors and the administration of the business entity (Glen et al., 1995). Many prominent research works such as Lintner (1956), Miller and Modigliani (1961), Baker and Powell (2000) on the subject of the payout policy has been carried out with pragmatic proof concerning the determinants of payout strategy. Still, there is absence of uniform and cohesive clarification on what factors stimulate the dividend policy. This is known as the dividend puzzle in finance literature (Black, 1976a). Many hypotheses have been developed to solve this dilemma but the challenge still exists.

The most key question regarding dividend policy is: what are the determining factors of dividend policy? Researchers have come out with several findings regarding the determinants such as Kania and Bacon (2005), Al-Malkawi (2007), Gill et al. (2012) exhibits firm's profitability, while Anil and Kapoor (2008) shows Liquidity position as a significant determinants. In reality, determining the suitable dividend policy it is often a strenuous task of harmonizing many contradictory forces. The vital elements are not complicated to recognize but the relations involving those elements are multifaceted and complex to explain (Ross et al., 2008). Researchers have mostly concentrated on developed economies; however, further focus into the payout policy debate can be gained momentum by an assessment of developing countries, like Bangladesh. This research planned to identify the determinants of dividends payout policy for manufacturing listed companies in Dhaka stock exchange (DSE) and to verify whether the potential determinants identified in the literature applies in an emergent stock exchange like DSE.

In developing countries like Bangladesh, intensive research in this area is rare. So, this gap inspires us to conduct the primary survey for identifying the factors which are considered in the time of dividend decision.

A number of prior studies have exhibits that dividend expenditure decision is subjective to various factors; it is sensible for the major stakeholders of a company to understand factors that influence company's dividend payout decisions. This research is projected to enhance conception of the stimulators of dividend payout within the manufacturing firms operating within the Bangladesh corporate environment.

In spite of ample amount of study, we still do not have any conclusive suggestion to the dividend dilemma (Baker et al., 2002).

There are considerable number of researches carried on the area of payout policy in context of different geography and industry but the definite driving force of dividend choice still remains inexplicable in corporate finance and advance investigation is essential to enhance the understanding of the subject (Baker and Powell, 1999). Hence lack of conclusive consensus resolution for the subject of dividend policy, result many researchers continuing to conduct investigate on this field in order to obtain a strong theoretical and pragmatic investigation on payout and solve this payout Dilemma.

Dividend distribution strategies for manufacturing companies listed at DSE differ significantly while operating under same business atmosphere. The questions how do the manufacturing companies decide on the rationality and rate of their payout impose the dilemma in dividend payout in Bangladesh context. These expose that there is no unified picture regarding dividend payout policy. Moreover it would also reasonable to argue that there are so many factors influence dividend policy and there is no certain rule of thumb for companies to decide on the rate of payout. In addition to that when pointing to the earlier experiential researches on dividend policy, most of them have been carried mainly on U. S. firms, developed countries, emerged market, Asia and western Africa but scarcely there is any proof has been recognized from Bangladesh perspective. So there is a need to observe the factors which determine the dividend payout policy for manufacturing companies listed at DSE, which may present additional insights for noteworthy factors to be evaluated.

The paper is structured as follow; the first section introduces about the dividend policy and its determinants. The second section represent the literature review (the contribution of previous researchers). The research methodology is clearly explained in Section 3. In the Section 4, analysis and its result are interpreted. The Section 5 and 6 represent conclusion and references respectively.

2 LITERATURE REVIEW

2.1 Empirical Evidence of Developed Countries

Lintner (1956) in his pioneering work on dividend policy interviewed managers from 28 enterprises and based on findings concluded that dividends are sticky, tied to long-term sustainable earnings, paid by mature enterprises, smoothed from year to year, and targeted a long-term payout ratio when determining dividend policy.

Baker et al. (1985) survey revealed that the first highly ranked determinant was the anticipated level of an enterprise's future earnings, the second factor was the pattern of past dividends and the third factor cited as important in determining dividend policy was the availability of cash. In particular, respondents were highly concerned with dividend continuity, and the respondents believed that dividend policy affects share value and dividend payments provide a signaling device of enterprise future prospects. Baker (2009) surveyed managements' views on stock dividends. The analysis was based on the responses of 121 responding enterprises. The major findings of the survey were that managers strongly agree on stock dividends which have a positive psychological impact, managers believe stock dividends enable them to express their confidence in the enterprise's future prospects, and the dominant motive for paying stock dividends is to maintain the enterprise's historical practice.

Baker and Powell (2000) investigated the views of corporate managers of major US enterprises about the factors influencing dividend policy. They concluded that the most important determinants of an enterprise's dividend policy were the level of current and expected future earnings and the pattern or continuity of past dividends.

Dalmácio and Corrar (2007) surveyed on management views on corporate dividend policy in Portugal. This paper focuses on the dividend policy of the companies listed on the Lisbon Stock Exchange (LSE), from the viewpoint of their managers. It takes as its starting point the results obtained from a questionnaire answered by the Chief Executive Office and the Chief Financial Officer. Following Lintner (1956), which were later confirmed by the empirical studies of Fama and Babiak (1968), Baker et al. (1985) and Partington (1989), they came to the conclusion that the most significant factors were the dividend stability and the shareholders' satisfaction. The importance of signaling and clientele effects was also significant. By using the factorial analysis and the principal component analysis in their study, they tried to identify new variables, which presented positive correlation with the dividend policy. Two factors, which explain about 56% of the total variance, were found. The results suggest that the managers of the listed companies determine the respective dividend policy as passive residual, though they show concern about the signaling of the prospective profit, the quotation stability and taxes. Besides that, they seem to be worried about the dividend stability and alterations, which can be reversible, and, also, with the current practice in the sector to which the company belongs. Also, the relative importance of the amount of shares in the hands of managers and controlling groups is relevant, which can be associated with the degree of capital concentration. Finally, they can say that the fact that it is easy to obtain external capital in the future also conditions the dividend policy.

Brav et al. (2005) surveyed 384 chief financial officers and treasurers to determine key factors that drive dividend and repurchase policy. The survey unveiled that, except under extraordinary circumstances, managers have a strong desire not to cut dividends. As a result, for enterprises that pay dividends tend to be smoothed from year to year and linked to sustainable long-run changes in profitability.

Baker et al. (2006) reported the results of a 2004 survey from managers of dividend-paying Norwegian firms listed on the Oslo Stock Exchange about their views on dividend policy. Specifically, they identified the most important factors in making dividend policy decisions and managers' views about various dividend-related issues. The most important determinants of a firm's dividend policy are the level of current and expected future earnings, stability of earnings, current degree of financial leverage, and liquidity constraints. No significant correlation exists between the overall rankings of factors influencing dividend policy between Norwegian and U. S. managers. Norwegian managers express mixed views about whether a firm's dividend policy affects firm value. Respondents point to the possible role of dividend policy as a signaling mechanism. No support exists for the tax-preference explanation for paying dividends.

Mizuno (2007) surveyed the views of corporate managers on payout policy of Japanese enterprises listed in Tokyo Stock Exchange. The analysis of the responses obtained from 69 enterprises revealed that on payout policy enterprises put higher emphasis on dividends than on share repurchases, enterprises attach more importance to stable dividends than to performance linked dividends, and corporate managers recognized the relationship between dividends and an enterprise's value.

Vieira (2011b), Archbold and Vieira (2010) and Vieira (2011a) reported the empirical results of a questionnaire survey about corporate dividend policy addressed to finance directors of UK and Portuguese listed firms. Similar to other studies for example, Brav et al. (2005) in the US and Dhanani (2005) in the UK, they surveyed 313 finance directors in the UK and 48 in Portugal to examine their views of and understanding about the dividend decision in order to compare practice with theoretical propositions to be found in the literature. Their survey results demonstrate similarities in the responses from the UK and Portugal, but also substantive differences, particularly in respect of the interaction between dividend and investment decisions and views about the signaling consequences of dividends.

Baker et al. (2011) surveyed on managers of firms listed on the Toronto Stock Exchange about their views on dividends. They found the perceptions of factors that influence dividend policy differ between managers of financial and nonfinancial firms. Industry classification also affects how managers view statements about the dividend pattern, dividend setting process, dividend policy and firm value, residual dividend theory, and explanations for paying dividends. However, they found weak, if any, multinational operations effect on manager perception of dividends. They concluded that researchers investigating dividends should partition the data by industry type and perhaps other firm characteristics to better understand the dividend puzzle.

2.2 Empirical Evidence of Developing Countries

Khurana (1985) surveyed the corporate dividend policy in India mailing structured questionnaire to the 215 enterprises. The survey and personal interviews, among others, revealed that dividend decision of enterprises was primarily governed by net profits and dividend paid in the previous year.

Manandhar (2002) surveyed the views of corporate executives on dividend policy and practice of corporate enterprises in Nepal. The major findings of the survey were that dividend decision was considered as discretionary decision, and lack of timely disclosure of relevant financial information and low rate of dividend payment were the major causes to the declining investors' confidence in the stock market.

Pradhan and Adhikari (2003) surveyed the views of financial executives of 50 large Nepalese enterprises. The survey findings, among others, revealed that major motive for paying cash dividends is to convey information to shareholders about favorable prospects of the enterprise and dividend decision is not a residual decision.

Deshmukh et al. (2013) analyzed the results of 2001 survey of 81 CFOs of bt-500 companies in India to find out the determinants of the dividend policy decisions of the corporate India. It uses factor analytic framework on the CFOs' responses to capture the determinants of the dividend policy of corporate India. Most of the firms have target dividend payout ratio and dividend changes follow shift in the long-term sustainable earnings. The findings on dividend policy are in agreement with Lintner's study on dividend policy. The dividend policy is used as a signaling mechanism to convey information on the present and future prospects of the firm and thus affects its market value. The dividend policy is designed after taking into consideration the investors' preference for dividends and clientele effect.

Basnet (2007) surveyed the views of managers on dividend policy of Nepalese enterprises listed at Nepal Stock Exchange Ltd. (NEPSE). The survey revealed that level of current and expected future earnings, liquidity constraints, projection about future state of the economy are the important factors in setting the enterprise's dividend policy in Nepal.

Adeyemi and Adewale (2010) studied on dividend policy. It is a pivot around which other financial policies rotate, hence central to the performance and valuation of listed firms. This is more because managers as decision makers are often confronted with the "dividend puzzle" – the problem of reconciling observed dividend behavior with economic incentives. This paper is motivated by the apparent dearth of empirical works on dividend policies and practices in Nigeria and hence aims to evaluate such policies and practices among selected Nigerian quoted firms. The result of the survey questionnaires shows that Nigerian investors' attitudes are consistent with those of the bird-in-the-hand theorists. Hence, Nigerian managers' beliefs are that dividend payouts have significant signaling effect both on share price and future prospects of a firm. Consequently, they strive to maintain a consistent and uninterrupted dividend payout policy.

Asghar et al. (2011) surveyed the views of 60 financial executives on practices of dividend policy in Nepal. The results revealed that among others, stability of earnings, level of current earnings, and pattern of past dividends were the three important factors in order of their importance determining dividend policy of corporate sector.

Adhikari (2013) analyzed the perceptions of managers on dividend policy by surveying the views of 125 Managers of 66 companies listed at Nepal Stock Exchange. This survey is motivated by the observation that much of dividend policy theory is implicitly based on a capital market perspective. Out of 66 listed enterprises surveyed, 16 were from banks and 50 were from nonbanks. To examine whether views of managers on dividend policy differ between banking group and nonbanking group, chi-square analysis was used. Spearman's rank correlation coefficient was calculated to find out the degree of relationship between the responses of banking group and nonbanking group and it was tested for significance at 5 percent level of significance. Median value of responses for each statement of observation on dividend policy was computed to highlight the significance of observation. The results of this study indicate that the most important determinants of dividend policy in order are growth rate of enterprise's earnings, patterns of past dividends, availability of investment opportunities; managers have more emphasis on the stable dividend policy; and dividend policy influences the value of the enterprise in Nepal.

Haleem et al. (2011) examined the perceptions of managers of dividend-paying firms listed on Karachi Stock Exchange (KSE) on factors influencing dividend policy, issues relating dividend policy and the corporate governance practices. The survey shows that the most important factors that affect dividend policy are: the level of current earnings, the projection about the future state of the economy, the stockholders characteristics, concerns about the stock prices, need of current stockholders. From a practical perspective, there is little discrimination among the top ranked factors. All the surveyed firms formulate their dividend policies according to the theoretical model of Lintner (1956). The survey also shows that there is no difference in responses about these factors with respect to various titles of the respondents such as chief financial officer or Chief Exceptive Officer. The survey also finds strong support for the life cycling theory followed by agency theory, signaling theory and the catering theory respectively. The survey also shows the presence of corporate governance practices in the surveyed firms.

Khan et al. (2011b) surveyed the opinions of finance directors of 60 foreign listed companies out of 105 foreign listed companies on Karachi stock exchange in order to visualize their view about the dividend decision. The survey resulted into some very important points to be noted that include: the firms give importance to the dividend as it was in past and the growth is considered at time of declaration of dividend; the dividend decision is influenced by the competitor policy and the fear of signaling of shortage of profitable investment; and the results demonstrate that foreign listed companies are more concerned with dividend policy.

Alshammari (2012) surveyed the corporate managers of 123 Kuwaiti firms listed in the Kuwait Stock Exchange (KSE) in order to look into what affects dividend policies in Kuwait. The questionnaire based survey with 52.58 percent response rate led some important findings. The major findings of the survey were that future earnings was a paramount factor that affects the level of current dividends and the level of current liquidity is another important factor affecting dividends in Kuwaiti listed firms.

Baker and Powell (2012) surveyed managers of dividend-paying firms listed on the Indonesian Stock Exchange (IDX) to learn their views about the factors influencing dividend policy, dividend issues, and explanations for paying dividends. Of the 163 firms surveyed, 52 firms responded, resulting in a response rate of 31.9 per cent. The evidence showed that managers view the most important determinants of dividends is the stability of earnings and the level of current and expected future earnings. The evidence also showed that managers of Indonesian firms perceive that dividend policy affects firm value.

Naser et al. (2013) surveyed the managers of the companies listed on Abu Dhabi Securities Exchange. The survey based on the responses obtained through 34 filled up questionnaires revealed, among others, that external factors related to the economic conditions together with the state of the capital market and lending conditions are all important factors in formulating dividend policy, and restrictions imposed on them by debt providers together with current financial market crises are the most important factors that affect their dividend policy.

Abor and Fiador (2013) surveyed the opinions of managers on factors influencing dividends decision in Nigerian listed firms. The survey revealed, among others, that pattern of past dividends, the level of current earnings, current degree of financial leverage, availability of alternative source of capital, liquidity constraints such as availability of cash, growth and investment opportunities have a significant influence on dividend decision in Nigerian firms.

John (2018) studied to examine the opinions of managers on factors influencing dividends decision in Nigerian listed firms. The study employs survey research design and obtained primary data from selected managers through the administration of questionnaire. The result of the study reveals that pattern of past dividends, level of current earnings, current degree of financial leverage, availability of alternative source of capital, liquidity constraints such as availability of cash, growth and investment opportunities have significant influence on dividend decision in Nigeria. The study recommends that future researchers should investigate the relationship between dividend payment and firms' value.

Naser et al. (2013) studied to explore the perception of managers of companies listed on Abu Dhabi exchange about dividend policy. Thirty-four out of fifty-nine managers of companies listed on Abu Dhabi Securities Exchange were asked to reflect their experience about different aspects of dividend policy. The bird-in-the-hand theory received the highest support. The study extends limited previous research based on questionnaire and survey related dividend policy. It thus provides new evidence from an emerging and fast growing economy.

The reviews of aforementioned surveys expose that there are various surveys on dividend policy mostly in the context of developed countries, and there are very few and less comprehensive surveys of managers with inconclusive results on dividend policy conducted in the context of Bangladesh. Thus, there is a need of conducting another survey of managers' views covering the divergent aspects of dividend policy in Bangladesh. Thus, there is a need of conducting another survey of managers' views covering the divergent aspects of dividend policy in Bangladesh. The important factors of dividend policy are past dividend, earnings, competitors' dividend, types of shareholders, liquidity level, tax, availability of external fund, legal rules and regulations, economic volatility etc.

2.3 Research Gap

In above paragraphs, review of literatures illustrate that the payout determinants have been well investigated and acknowledged in first world economies, emerging markets like Malaysia, India, Pakistan and Saudi Arabia and few in Africa like Nigeria, south Africa and Ghana but there is scarcity of experiential studies in Bangladesh context. Therefore the research essential to fill the knowledge gap sustaining by practically identifying the significant factors concerning payout policy in Bangladesh for the manufacturing companies listed at DSE. Besides, a range of research from different country, economy and business context have been carried out to sort out the dividend dilemma. But due to the difference in legal, the tax and the accounting policy among the countries and across industries with mixed characteristics, there is no cohesive means to set out dividend payout strategy. These implying that dividend dilemma still exist and require research regarding determinants of dividend payout policy for the manufacturing companies listed at DSE in Bangladesh. thus this study is modest input to resolve dividend dilemma.

At long last, most of existing research use multiple regressions but not panel data (cross sectional)/time series multiple regression. This study adopts panel data regression as well factor analysis in identifying the determinants of dividend payout policy for the manufacturing companies listed at DSE in Bangladesh.

This research has got substantial contribution in a number of ways. To begin with, it focuses on the decisive factors of managers while deciding on the dividend policy. The topic payout policy is very imperative as a lucrative and frequent corporate dividend policy followed by higher management would establish yardstick of the wellbeing of the firms thus more dividends can be dispersed to the equity holders while sustaining the inclusive wellbeing of the corporation. Secondly, the research exhibits a major part to existing academic and experiential facts concerning determinants of payout policy. Finally, the research may provide as an orientation and foundation for advance study on determinants of dividend payout policy actions in developing countries.

3 RESEARCH DESIGN

The present research is based on an empirical study of 108 listed firms from the DSE (Dhaka Stock Exchange) with the objective of identifying the determinants of dividend policy. The data have been collected through the primary mode using a structured questionnaire containing 28 statements based on 5 point likert scale where not important = 0, low important = 1, moderate = 2, important = 3, very important = 4. The respondents are asked to indicate the level of importance of the factors for determining their firm's dividend policy. The questionnaire has been prepared after reviewing the prior studies on dividend practices by decision maker. The survey follows the literature of Baker and Powell (2000), Brav et al. (2005), Baker et al. (1985) etc.

We have mailed the survey instruments to the chief financial officer (CFO) and Managing director, Chairman, Board of directors of each firm in September 2015. The mail included a cover letter and a stamped return envelope. The cover letter assured recipients that their answers would be confidential and released only in summary form. But we did not find satisfactory response. So, later, we went personally to the respondents of each firm. Finally, we have collected 108 respondents' opinion through questionnaire.

We have used a nonparametric test (χ^2 test) to determine whether the mean response for each of the 28 factors involving dividend policy differs significantly from 0 (not important). This study follows the test of Baker and Powell (2000), Baker et al. (1985) etc.

The factor analysis has been used to analyze the dividend determinants by decision maker. The Principal Components Analysis has been used to explore and confirm the interrelatedness between the occurrences of variables pertaining to dividend. The number of principal components to be retained has been decided based on Kaiser's criterion of Eigen value $>$ 1 and Bartlett's test. The Bartlett's test of significance led to acceptance of significant principal components. The PCA with varimax rotation method has been used to maximize the sum of squared loading of each factor extracted in turn. It explained more variance than the loadings obtained from any other method of factoring. The factors loaded by variables having significant loadings of the magnitude of 0.5 and above have been interpreted.

Tab. 1: Variables used in the study

No.	Factors	No.	Factors
X_1	Pattern of past dividend	X_{15}	Preference for dividends rather than risky reinvestment
X_2	Desire to maintain a constant payout ratio	X_{16}	Cost of raising external funds
X_3	The dividend policies of competitors or other companies in the same industry	X_{17}	Availability of profitable investment opportunities for the firm
X_4	Stability of earnings	X_{18}	Availability of alternative source of capital
X_5	Level of current earnings	X_{19}	Investors opportunities for investing in another projects
X_6	Anticipated level of future earnings	X_{20}	Concern that a dividend change may provide a wrong signal to investors
X_7	A sustainable change in earnings	X_{21}	The future state of the economy
X_8	Attracting institutional investors to purchase the stock	X_{22}	Inflationary Consideration
X_9	The influence of institutional shareholders	X_{23}	Concern about maintaining a target capital structure
X_{10}	Attracting individual investors to purchase the stock	X_{24}	Legal rules and constraints
X_{11}	Concern about the stock price	X_{25}	Contractual constraints such as dividend restriction in debt contracts
X_{12}	Liquidity level	X_{26}	Accessibility to capital market
X_{13}	Tax positions of shareholders	X_{27}	Dilution of control & dilution of earnings
X_{14}	Category of shareholders and their expectations	X_{28}	Internal rate of return consideration i.e. reinvestment rate

4 RESULTS AND DISCUSSIONS

4.1 Nonparametric Test

From the Tab. 2, it is seen that the variable 3 (the dividend policies of competitors or other companies in the same industry) and variable 19 (investors opportunities for investing in another projects) are statistically insignificant at χ^2 test and the more than 40 percent respondents gave their opinion as not important and low important variables on dividend determinants.

Among the significant variables, the variables 5 (level of current earnings), 12 (liquidity level), 1 (pattern of past dividend), 4 (stability of earnings), 2 (desire to maintain a constant payout ratio) are the top five significant determinants in dividend decision. These reveal the picture of dividend determinants in our country. The companies mainly consider the current earnings and liquidity position of the company. They also maintain to follow the pattern of previous years dividend payment by paying stable dividend payout ratio. Others factors are relevant but the managers mainly consider the earlier to most significant factors. The results support the findings of Mizuno (2007), Khan et al. (2011b), Alshammari (2012), Baker and Powell (2012), Naser et al. (2013), John (2018), Manandhar (2002), Shah et al. (2010), Baker et al. (2011), Archbold and Vieira (2010).

We have conducted the factor analysis with the significant variables for identifying the relevant determinants of dividend decision.

4.2 Factor Analysis

The scale of measurement was tested using Cronbach α reliability test. It was found to be 0.810 which is considered a satisfactory level of reliability.

The tests have been conducted to know that whether the sample is adequate or not. The sampling adequacy is depicted in Tab. 4.

Tab. 2: Test of significance

	Level of importance (%)								
	Very important	**Important**	**Moderate**	**Low important**	**Not important**	**Mean**	**Rank**	**χ^2 value**	**Asymp. Sig.**
X_1	32.56	48.84	15.12	1.16	2.33	3.0706	3	72.25	0.000
X_2	16.28	26.74	47.67	19.77	0.00	2.9765	5	62.60	0.000
X_3	12.79	23.26	27.91	23.26	15.12	1.9294	23	5.51	0.239
X_4	40.70	41.86	13.95	2.33	1.16	3.1882	4	69.23	0.000
X_5	46.51	37.21	13.95	2.33	0.00	3.2941	1	42.93	0.000
X_6	15.12	39.53	30.23	13.95	1.16	2.5294	7	38.76	0.000
X_7	13.95	39.95	32.56	10.47	2.33	2.4941	9	41.20	0.000
X_8	4.65	12.79	38.37	30.23	13.95	1.6588	26	32.98	0.000
X_9	2.33	12.79	43.02	29.07	12.79	1.6353	28	44.23	0.000
X_{10}	12.79	24.42	33.72	15.12	13.95	2.0941	18	13.76	0.008
X_{11}	36.05	33.72	17.44	9.30	3.49	2.8824	6	36.09	0.000
X_{12}	50.00	34.88	8.14	5.81	1.16	3.2588	2	78.18	0.000
X_{13}	10.47	22.09	29.07	31.40	6.98	1.9647	21	20.51	0.000
X_{14}	11.63	22.09	34.88	24.42	6.98	2.0706	19	20.86	0.000
X_{15}	3.49	20.93	33.72	32.56	9.30	1.7529	25	31.55	0.000
X_{16}	6.98	19.77	39.53	25.58	8.14	1.9059	22	31.09	0.000
X_{17}	16.28	38.37	26.74	13.95	4.65	2.5059	8	30.70	0.000
X_{18}	10.47	37.21	29.07	18.60	4.65	2.2941	15	30.39	0.000
X_{19}	10.47	17.44	24.42	22.09	25.58	1.6471	27	6.55	0.161
X_{20}	12.79	37.21	30.23	15.12	4.65	2.3765	12	30.62	0.000
X_{21}	10.47	39.53	24.42	22.09	3.49	2.3412	14	33.07	0.000
X_{22}	6.98	29.07	32.56	23.26	8.14	2.0588	20	24.11	0.000
X_{23}	9.30	38.37	36.05	10.47	5.81	2.3765	13	43.07	0.000
X_{24}	20.93	26.74	26.74	20.93	4.65	2.4118	11	14.11	0.007
X_{25}	4.65	13.95	40.70	23.26	17.44	1.8588	24	27.37	0.000
X_{26}	6.98	31.40	41.86	12.79	6.98	2.1647	16	68.04	0.000
X_{27}	12.79	41.86	31.40	9.30	4.65	2.1412	17	42.83	0.000
X_{28}	12.79	41.86	31.40	9.30	4.65	2.4824	10	43.41	0.000

Tab. 3: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of items
0.810	0.809	26

Tab. 4: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.632
Bartlett's Test of Sphericity:	
Approx. χ^2	940.922
df	378
Sig.	0.000

KMO recommends accepting value greater than 0.5 as barely acceptable and Bartlett recommends the accepting value less than 0.05. Since the accepting value for variables is 0.632 (more than 0.5) for KMO and 0.000 for Bartlett's test (less than 0.05), these measures indicate that the set of variables is appropriate for factor analysis and the analysis can proceed for next stage.

Factor analysis procedure is based on initial computation of a table of correlations among the variables that is, correlation matrix. This matrix is then transformed through estimation

Tab. 5: Total variance explained

Component	Initial Eigen values			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	5.122	18.294	18.294	5.122	18.294	18.294	3.004	10.729	10.729
2	3.123	11.153	29.447	3.123	11.153	29.447	2.688	9.601	20.331
3	2.421	8.648	38.095	2.421	8.648	38.095	2.620	9.358	29.688
4	2.217	7.917	46.012	2.217	7.917	46.012	2.270	8.108	37.796
5	1.568	5.601	51.613	1.568	5.601	51.613	2.023	7.226	45.022
6	1.462	5.220	56.833	1.462	5.220	56.833	1.797	6.417	51.440
7	1.410	5.035	61.869	1.410	5.035	61.869	1.777	6.347	57.786
8	1.261	4.503	66.372	1.261	4.503	66.372	1.628	5.815	63.601
9	1.124	4.015	70.387	1.124	4.015	70.387	1.514	5.407	69.008
10	1.014	3.623	74.009	1.014	3.623	74.009	1.400	5.001	74.009
11	0.790	2.821	76.830						
12	0.676	2.414	79.245						
13	0.652	2.329	81.574						
14	0.615	2.197	83.771						
15	0.579	2.068	85.839						
16	0.502	1.792	87.630						
17	0.445	1.590	89.221						
18	0.435	1.555	90.775						
19	0.415	1.484	92.259						
20	0.387	1.381	93.640						
21	0.328	1.171	94.812						
22	0.300	1.071	95.883						
23	0.274	0.980	96.862						
24	0.241	0.860	97.723						
25	0.216	0.772	98.495						
26	0.167	0.595	99.090						
27	0.138	0.492	99.582						
28	0.117	0.418	100.000						

Note: Extraction Method – Principal Component Analysis.

of a factor model to obtain the factor matrix containing the loadings for each variable on each derived factor. The Tab. 5 contains the information regarding the factors and the relative explanatory power as expressed by their eigen values. As per the latent root criteria of retaining the factors, those factors should be retained that have eigen value > 1. The Eigen values, the percentage of total variance, and rotated sum of squared loadings have been shown in Tab. 5. The factor matrix as obtained in the principal component analysis has also been further subjected to Varimax Rotation. An examination of Eigen values has led to the retention of ten factors. These factors have accumulated for 10.72%, 9.60%, 9.35%, 8.10%, 7.22%, 6.41%, 6.34%, 5.815%, 5.40%, and 5.00%of variation. This implies that the total variance accumulated for by all ten factors is 74.00% and remaining variance is explained by other factors.

The application of Cattell (1966) Scree test (Fig. 1) resulted in acceptance of Factors. The Scree plot shows the factor eigen values in

Tab. 6: Rotated component matrix

	1	2	3	4	5	6	7	8	9	10
X_{14}	0.782	−0.048	0.152	0.166	0.080	−0.119	0.153	−0.032	0.179	−0.111
X_{13}	0.753	−0.044	0.022	0.019	0.192	0.008	−0.246	0.173	0.060	−0.010
X_8	0.609	0.098	0.045	0.200	−0.059	0.236	0.453	−0.192	−0.234	0.099
X_9	0.543	−0.113	0.119	0.086	0.183	0.526	0.100	0.108	−0.219	0.225
X_{15}	0.482	0.101	0.471	−0.026	0.254	0.001	0.163	−0.160	−0.075	0.251
X_4	0.090	0.800	0.000	0.062	−0.044	−0.101	−0.063	−0.225	0.023	0.023
X_5	−0.159	0.728	−0.171	0.130	0.040	−0.108	0.253	0.175	0.018	0.015
X_6	0.021	0.677	0.399	−0.066	0.059	0.162	0.107	0.106	−0.201	0.051
X_7	0.003	0.585	0.324	0.026	0.138	0.329	−0.022	0.216	0.210	−0.247
X_{12}	0.090	0.453	0.017	0.252	0.375	−0.445	−0.153	0.228	−0.155	−0.093
X_{21}	0.089	0.076	0.876	0.045	−0.037	0.007	0.010	0.108	0.029	0.040
X_{22}	0.132	0.026	0.658	0.362	−0.123	0.050	0.282	−0.135	−0.080	−0.095
X_{24}	−0.015	0.157	0.580	0.075	−0.034	0.248	0.209	0.162	0.146	−0.430
X_{26}	0.166	−0.117	0.100	0.803	0.054	0.118	0.102	0.201	0.058	−0.212
X_{27}	0.067	0.218	0.150	0.767	0.041	0.141	−0.060	−0.055	0.095	0.214
X_{28}	−0.241	0.330	0.169	0.468	0.077	0.150	0.088	0.266	0.273	−0.034
X_{10}	0.215	−0.078	0.053	−0.084	0.778	−0.011	0.270	−0.016	−0.133	−0.058
X_2	−0.057	0.138	−0.092	0.065	0.704	0.122	−0.244	−0.053	0.399	0.008
X_{11}	0.022	0.112	−0.137	0.471	0.644	−0.116	0.025	−0.150	−0.125	0.144
X_{25}	0.085	0.025	0.094	0.297	−0.024	0.835	0.018	0.085	−0.085	0.049
X_{16}	0.177	0.039	0.269	−0.001	0.146	0.162	0.742	−0.005	0.054	0.100
X_{17}	−0.084	0.207	0.063	0.088	−0.078	−0.195	0.629	0.495	0.062	−0.002
X_{18}	0.124	0.037	0.070	0.086	−0.088	0.119	0.052	0.643	0.096	0.085
X_1	0.074	−0.017	−0.014	0.104	−0.036	−0.124	0.035	0.096	0.857	0.134
X_{23}	−0.014	−0.312	0.374	0.332	0.131	0.243	0.282	0.075	0.481	0.126
X_{20}	−0.093	0.004	−0.008	0.019	−0.006	0.149	0.132	0.126	0.191	0.780

Notes: Extraction Method – Principal Component Analysis, Rotation Method – Varimax with Kaiser Normalization. Rotation converged in 14 iterations.

descending order. The eigen values of a factor represents the variance explained by each factor. An elbow in the Scree plot occurs at Factor 10, which indicates the point at which the inclusion of additional factors does not contribute significantly in explaining the variance of the data set. The results of the analysis are presented in the form of factor pattern matrix. Factors above the elbow of the plot are retained. A set of 10 Factors that were chosen accounts for about 74.009% of the variations in the data.

After studying the Eigen values for the components, the next step is to study the factor matrix and the respective factors loadings. The loadings above 0.45 have been considered for this study. For obtaining the rotated factor matrix, orthogonal rotation method (Varimax rotation) has been used. The results are displayed in Tab. 6.

After identifying the significant factor loadings, next step is to study the communalities of the variables, representing the amount of variance accounted for by the factor solution for each variable. It is generally assumed that variable with communalities > 0.5 should be retained for the study, the communalities of the variables have been shown in the Tab. 7.

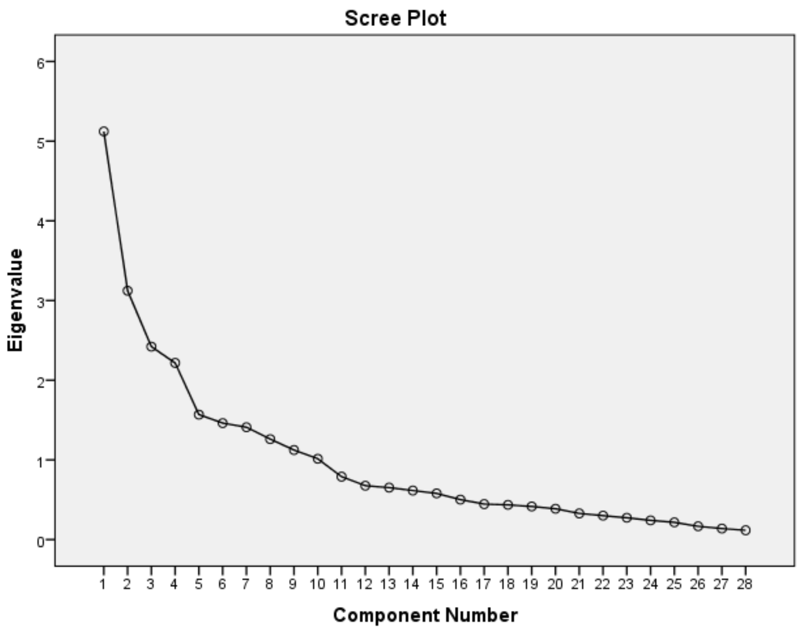

Fig. 1: Scree plot

Tab. 7: Communalities

	Initial	Extraction		Initial	Extraction
X_1	1.000	0.796	X_{15}	1.000	0.650
X_2	1.000	0.767	X_{16}	1.000	0.716
X_4	1.000	0.720	X_{17}	1.000	0.750
X_5	1.000	0.711	X_{18}	1.000	0.813
X_6	1.000	0.717	X_{20}	1.000	0.817
X_7	1.000	0.727	X_{21}	1.000	0.799
X_8	1.000	0.789	X_{22}	1.000	0.712
X_9	1.000	0.759	X_{23}	1.000	0.669
X_{10}	1.000	0.762	X_{24}	1.000	0.706
X_{11}	1.000	0.742	X_{25}	1.000	0.820
X_{12}	1.000	0.724	X_{26}	1.000	0.812
X_{13}	1.000	0.701	X_{27}	1.000	0.746
X_{14}	1.000	0.753	X_{28}	1.000	0.598

Note: Extraction Method – Principal Component Analysis.

The principal component analysis using varimax rotation of twenty six variables has led to the extraction of ten factors. Tab. 8 represents the final results of the study and reflects the extraction of the factors that are considered more influential by the respondents.

The rotated factor matrix has been shown in Tab. 6. This shows that variables understudy have constituted ten groups factors. These have been discussed in the following paragraphs.

Factor-I: Clientele factor. Factor-I explains 10.72% of the total variations existing in the variable set. This includes variables X_{14}, X_{13}, X_8, X_9 and X_{15}. This factor has significant factor loadings on these variables which have formed this major cluster. So, this factor provides a basis for conceptualization of a dimension, which may be identified as ‘clientele factor’.

Factor-II: Earnings and liquidity factor. Factor-II explains 9.6% of the total variations existing in the variable set. This includes variables X_4, X_5, X_6, X_7 and X_{12}. This factor has significant factor loadings on these variables which have formed second important cluster. So, this factor provides a basis for conceptualization of a dimension, which may be identified as ‘earnings and liquidity factor’.

Factor-III: Economic related factor. Factor-III explains 9.35% of the total variations existing in the variable set. This includes variables X_{21}, X_{22} and X_{24}. This factor has significant factor loadings on these variables which have formed third cluster. So, this factor provides a basis for conceptualization of a dimension which may be identified as 'economic related factor'.

Factor-IV: Capital market related factor. Factor-IV explains 8.1% of the total variations existing in the variable set. This includes variables X_{26}, X_{27} and X_{28}. This factor has significant factor loadings on these variables which have formed fourth cluster. So, this factor provides a basis for conceptualization of a dimension, which may be identified as 'capital market related factor'.

Factor-V: Market price related factor. Factor-V explains 7.22% of the total variations existing in the variable set. This includes variables X_{10}, X_2 and X_{11}. This factor has significant factor loadings on these variables which have formed fifth cluster. So, this factor provides a basis for conceptualization of a dimension which may be identified as 'market price related factor'.

Factor-VI: Legal constraint factor. Factor-VI explains 6.41% of the total variations existing in the variable set. This includes variable X_{25}. This factor has significant factor loadings on these variables which have formed sixth cluster. So, this factor provides a basis for conceptualization of a dimension which may be identified as 'legal constraint factor'.

Factor-VII: Residual policy factor. Factor-VII explains 6.34% of the total variations existing in the variable set. This includes variables X_{16} and X_{17}. This factor has significant factor loadings on these variables which have formed seventh cluster. So, this factor provides a basis for conceptualization of a dimension which may be identified as 'residual policy factor'.

Factor-VIII: Capital source factor. Factor-VIII explains 5.81% of the total variations existing in the variable set. This includes variable X_{18}. This factor has significant factor loadings on these variables which have formed eighth cluster. So, this factor provides a basis for conceptualization of a dimension which may be identified as 'capital source factor'.

Factor-IX: Pattern of past dividend issue factor. Factor-IX explains 5.4% of the total variations existing in the variable set. This includes variables X_1 and X_{23}. This factor has significant factor loadings on these variables which have formed ninth cluster. So, this factor provides a basis for conceptualization of a dimension which may be identified as 'pattern of past dividend issue factor'.

Factor-X: Signaling factor. Factor-X explains 5.00% of the total variations existing in the variable set. This includes variable X_{20}. This factor has significant factor loadings on these variables which have formed tenth clusters. So, this factor provides a basis for conceptualization of a dimension which may be identified as 'signaling factor'.

Finally, the rankings obtained on the basis of factor wise scores are shown in the Tab. 8.

Tab. 8: Rankings of the factors

Factor		**Average score**	**Rank**
I	Clientele	1.16	10
II	Earnings and liquidity	1.91	1
III	Economic related	1.59	5
IV	Capital market related	1.51	7
V	Market price related	1.85	3
VI	Legal constraint	1.54	6
VII	Residual policy	1.49	8
VIII	Capital source	1.47	9
IX	Pattern of past dividend issue	1.88	2
X	Signaling	1.84	4

Note: Data have been compiled by the researcher.

The ranking shows that Factor-II (earnings and liquidity) is most important factor that leads the dividend decision in Bangladesh. This factor includes variables X_4 (stability of earnings), X_5 (level of current earnings), X_6 (anticipated level of future earnings), X_7 (a sustainable change in earnings) and X_{12} (liquidity level). This implies that the managements of a company concern about the earnings and liquidity position of the company.

The second important factor is the 'pattern of past dividend issue' which indicates that the companies follow the previous trend of dividend payment in dividend decision. The third important factor is 'market price related factor' which implies that the companies take the dividend decision to maximize the market

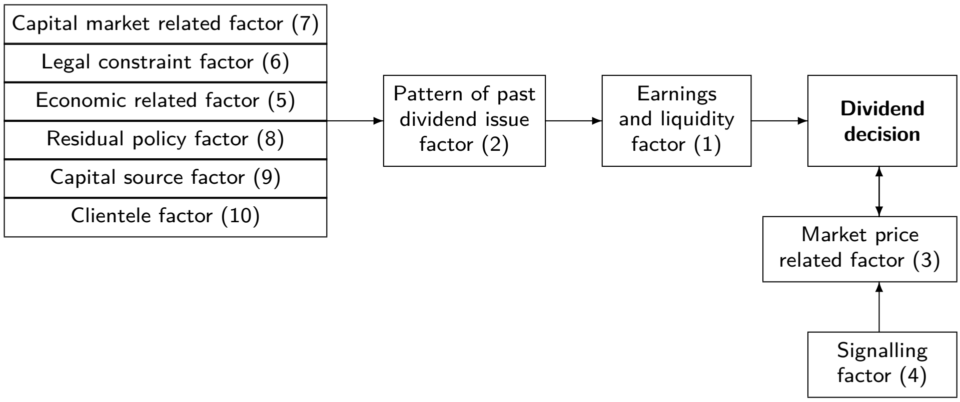

Fig. 2: Theoretical model framework

price of share. The other important factors are signaling factor and economic related factor.

But it is a great concern that the clientele issue is lowest position (10^{th}) in ranking. The company has less concern about the categories of investors and they do not set the dividend policy to attract the specific group of investors.

On the basis of findings from χ^2 test and factor analysis, we have developed a theoretical framework which is discussed below.

We have developed this model framework on the basis of importance of the factors in determining the dividend decision. In the first stage, the factors – economic related factor, legal constraint factor, capital market related factor, residual policy factor, capital source factor, clientele factors are considered in dividend decision making. Then in the second stage, the companies follow the previous years' pattern of dividend payment. In the next stage, dividend decision is made mainly on the level of earnings and liquidity. On the other hand, dividend decision is closely related to market price of share. The market price of share is influenced by the signaling impact of dividend payment.

5 CONCLUSION

This study presents the factors of dividend decision which are considered before taking dividend policy. The companies mainly consider the current earnings and liquidity position of the company for dividend decision. They also maintain to follow the pattern of previous years dividend payment and stable dividend payout ratio. The findings support the findings of Baker et al. (1985), Baker (2009), Baker and Powell (2000), Deshmukh et al. (2013), Mizuno (2007), Khan et al. (2011a) and Alshammari (2012).

The broad literature on dividend payout strategy the US or European listed firms. But this research tries to observe whether the chosen factors have momentous roles to identify dividend payout policy for manufacturing firms listed in DSE or not. The result can be useful to other industries and have suitable recommendation for the managers.

Even though the paper uses a thorough panel data analysis for determining the variables effect payout policy, the existing factors and the number of samples entities can be further extended to other industries listed in the DSE and CSE in Bangladesh and can have new viewpoint to determine key determinants of dividend payout policy. Also, investigating the impact of other variables such as size of the firm, degree of leverage (both operating and financial), market risk and regulation may have fascinating recommendations for policy makers. Thus, it requires profound analysis of DSE listed firms to decide what factors, in exact, have considerable roles and can be comprehensive for further study. In addition to that, the study conducted by using primary survey data from received from the chief financial officers of the selected firms and statistically analyzed. The primary data will more inclusively reveals the determinants of listed company's payout policy to their shareholders rather than secondary data which examine the variation of high or low dividend payout. Finally, the research did not include service, financial and foreign firms listed at DSE, this implies that the findings can only be generalized to firms similar to those who participated to the research and not fully reflected the dividend policy to all listed firms at DSE.

The outcome and the investigation have revealed some additional insights which need to be analyzed in future research. More firm related variables/factors than the ones incorporated in the research should have an impact on the payout rate. Hence it would be fascinating to carry out a similar research with diverse company chosen factors. For example the impacts of firm's age, business risk, ownership status, tax policy and structure formation on payouts policy. On the basis of the practical result in this study, it can be concluded that further related research would be desirable; further study including dividend paying and nondividend paying firm using other a regression techniques such as Tobit and Probit models to observe the determinant variables of dividend payment decisions of the manufacturing industry listed at DSE with using primary data from interview and questionnaires approach.

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DIFFERENCES OF DIVERSITY ATTITUDES BETWEEN EMPLOYEES WITH AND WITHOUT AN IMMIGRATION BACKGROUND: THE CASE OF GERMANY

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EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 4 Issue 2
ISSN 2336-6494
www.ejobsat.com

ABSTRACT

The demographic shift in the age structure has the effects that many ageing employees work in organisations. Migration can slow down the ageing of population but could not stop it. More and more people with immigration background work in organisations. Therefore, the question is whether diversity sensitive attitudes count for all diversity aspects. The central aim of the study is to deal with the problem fields of multicultural teamwork. Thereby, the focus is on the collaboration of employees with and without immigration background. The interviews with employees with and without an immigration background of various company branches were conducted. The results show that employees with an immigration background have more contact and feel comfortable with persons from different cultures than employees without an immigration background. The qualitative analysis indicates that there is a high need of competence development, especially intercultural and social competences in organisations. The results of the study reveal that personality traits and characteristics of employees play a role to what extent they accept diversity and are willing to work with persons from another culture. Age is not important regarding intercultural competence development.

KEY WORDS

diversity attitudes, multicultural teamwork, migration

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1 INTRODUCTION

The demographic trend of Europe had changed tremendous in the last decades. New challenges have arisen – started from an ageing population to an intensive immigration. Especially Germany is concerned by this development. Ageing people define increasingly the social image in

GENKOVA, Petia, and KEYSERS, Pia. 2018. Differences of Diversity Attitudes between Employees with and without an Immigration Background: The Case of Germany. *European Journal of Business Science and Technology,* 4 (2): 174–186. ISSN 2336-6494, DOI http://dx.doi.org/10.11118/ejobsat.v4i2.115.

Europe. More than 127 million people are over 60 years old in Europe. This represents a population share of 25% (German Federal Statistical Office, 2016). The demographical change is farthest advanced in Germany, compared to other European countries (German Federal Statistical Office, 2016). Based on demographic changes and the high number of immigration in the years of 2015 and 2016, the society is getting more and more cultural heterogeneous in Europe (German Federal Statistical Office, 2016).

This trends changed the attitudes towards diversity significantly. Thus, the interest in the issue diversity by politics, societies and organisations has risen greatly in the last years. Diversity has become a more important topic in Germany as well as in other European countries. Women as well as people with an immigration background and ageing employees gain more importance at the labour market. For one thing the demographic change is a challenge for organisations. For the other thing it provides an opportunity for groups like ageing people and people with an immigration background (German Federal Statistical Office, 2016). Diverse teams in organisations are one of the consequences of the demographic change (Kunze and Goecke, 2016).

Migration is not only a challenge for organisations and societies, but generate new opportunities for the social progress, economic productivity and innovative capability through heterogeneity and diversity (Pitts, 2009). Research shows that a diverse workplace improves the satisfaction and compliance of employees as well as the performance and communication in teams (Pitts, 2009). However, the research had shown that diversity is primarily associated with stress and difficulties but less with the positive opportunities for innovation and development.

The demand for qualified professionals will further increase in the next years. Women, ageing employees and employees with an immigration background are getting more important for companies to counteract the demographical changes (Adenauer, 2015).

2 DIVERSITY ATTITUDES

Diversity in organisations support the building of personnel diversity (Becker, 2006) and describes the commonalities and differences of people (Krell, 2003). Diversity indicates both the obvious and barely perceived and salient characters like for example age, religion, sexual orientation, cultural values as well as barely obviously changing characters like language and competence (Miliken and Martin, 1996).

Diversity Management includes the values of equal opportunity and fairness. It contributes significantly to the expectations of employees regarding the respect of different individuals that can be satisfied by the company (Magoshi and Chang, 2009). When employees have the feeling of equal opportunity and fair treatment, the fluctuation can be reduced (Chrobot-Mason and Aramovich, 2013).

The presentation of diversity within the organisation has an impact on how employees and leaders accept diversity guidelines. This perception affects the performance of employees and, therefore, the business performance (Groeneveld and Verbeek, 2012; Nishii et al., 2008). It is important that diversity actions are in accordance with the corporate culture and the business model. This means that diversity actions should fit to the organisation and do not feel like foreign matter. Research had shown that diversity management is only successful if it was implemented as a top-down-process. Therefore, it is important that the leadership as well as every company level support diversity. The success of diversity depends highly on whether and to what extent leaders support the process and are a role model for their employees (Groeneveld and Verbeek, 2012; Nishii et al., 2008). Cultural diversity remains to be one of the hardest challenges even if every organisation is already grappling with gender mainstream and elderly staff. Hereby considerably more problems and conflicts are expected than with the integration of women and elderly staff into established working processes. The implementation of cultural diversity requires especially culturally sensitive actions, a complex cultural environment as well as intercultural competences and diversity management (Lanfranchi, 2013).

Cultural diversity can set impulses in a number of society areas, economic sectors and areas of life. Nevertheless, the research shows that individuals can see diversity as a threat (van Knippenberg et al., 2013).

Diversity can be enriching for organisations and individuals, when they engage in perspective change (Page, 2007). Studies have shown that people with pro-diversity beliefs describe groups as good, precisely by the fact that that groups are diverse. This accords to the social identity. People with a pro-diversity belief identify themselves stronger with the group (van Dick et al., 2008). Wolf and van Dick (2008) pointed out in their study, that people, who see migrants as enrichment, have more contacts to them and express less xenophobia, compared to those, who do not see migrants as enrichment for the society. Stegman (2011) illustrated in his Meta-Analysis that pro-diversity beliefs as well as a positive diversity culture result in beneficial results for groups and individuals and increase the job performance.

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The development of diversity in organisations reduces the fluctuation rate of employees. As a result, costs for organisations will be reduced (Armstrong et al., 2010; Roland Berger Study, 2012; Evans, 2014). Furthermore, the productivity as well as the innovation capability of employees increase when organisations develop the individual competences of their employees (Evans, 2014; Armstrong et al., 2010). A diverse team has a positive impact on new aspects and ideas of employees. The diversity and differences of competences produces new approaches for problem solving as well as suggestions for improvement (Pitts, 2009).

Which parameter do promote and support diversity? Are there difference in handling with diversity?

Appropriate knowledge, intercultural abilities and competences have to be generated and transferred to implement a successful diversity management. The culture-comparative and intercultural research shows (Berry et al., 2012; Genkova, 2012; Segall et al., 1999) that culturally conditioned fault lines can arise based on cultural differences, especially, in connection with acculturation processes or forms of economic cooperation (Asbrock et al., 2012; Homan et al., 2007).

Studies have shown that acculturative individuals can adapt better to the society and prefer to keep their own origin culture and integrate in the bigger national society. Thus, they prefer to connect both cultures. Most countries have introduced multicultural rules and guidelines for integration, which include only assimilation, segregation or marginalization, instead of integration (Berry et al., 2011).

The perception of intergroup difference is an important influence factor in culturally diverse societies. This is examined inter alia by van Osch and Breugelmans (2012). They analysed the perceived group difference as organisational principle of intercultural attitudes and acculturation attitudes.

Minority groups, who were perceived as being more different from themselves by the majority members, received less support for multiculturalism. Furthermore, they were seen as a threat and less competent by the majority group.

Majority members assumed that minority groups did not want to adapt the culture of the majority group to maintain their own ethnical culture.

Minorities, who perceived themselves as different to the majority group, could better adapt to multiculturalism. They adopted the mainstream culture less and maintained their own culture more. Van Osch and Breugelmans

(2012) showed that intergroup differences are an important aspect of intergroup relationships in culturally diverse societies.

Diversity can also lead to rejection by individuals. This demarcation attitude can lead to the fact that diversity is perceived as threat and stress, not only by employees with an immigration background but also by employees without an immigration background.

Stereotypes and prejudices can disturb diverse teamwork. Negative stereotypes can reduce the performance of group members. These aspects are examined by a number of studies (Stereotype Threat, cf. Blascovich et al., 2001; Stelle and Aronson, 1995). Negative stereotypes can increase the probability of internal attribution of failure (Koch et al., 2008) and can lead to the fact that individuals dissociate from the domain group, which confront them with negative stereotypes (von Hippel et al., 2005). Thereby, the experience of Stereotype Threat has direct effects on the job performance of individuals as well as on the motivation (Martiny et al., 2013).

The research illustrates a diverse management guidance exerts positive influence on the performance of the organisation (Talke et al., 2010; Nielsen and Nielsen, 2013; Baixauli-Soler et al., 2015). The perception of diversity climate affects significantly the extent to which employees have the feeling to be themselves at work. This encourages employees to develop innovative solutions and to identify themselves with the organisation (Chrobot-Mason and Aramovich, 2013).

Diversity has not only benefits on the individual level, but also on the organisational level as well as the team level. The implementation of diversity management creates a positive image among employees and customers. To use the potential of diversity, the dominant diversity has to be organised and be consciously integrated in the particular organisation. Then, everyone experiences positive aspects by intercultural cooperation (Thomas, 2006; Franken, 2015).

However, in practice, it often turns out a different picture. One culture dominates the other. This leads to a differentiation between non-dominant groups and dominant groups (Berry et al., 2011).

Diversity can also have a number of disadvantages for individuals, for persons with an immigration background as well as for persons without an immigration background. Ward (1996) examined that the acculturation process is more difficult, when the differences between two cultures are larger. When the cultural distance is too big, behavioural changes are a bigger challenge for individuals because a larger amount of changes are demanded by the group, dominant or non-dominant group. However, the change of the non-dominant group is greater. When the challenge of changing is a serious threat for the individual, this phenomenon is called acculturative stress (Ward, 1996).

Multicultural societies promote two cultural identities and characteristics of ethno-cultural groups and accept the contact and participation of groups in the bigger pluralistic society (Berry et al., 2011). It is the knowledge of stereotypes about the own minority as well as eventual discrimination by others that can lead to stress at employees with an immigration background (Meyer, 2003). Discrimination causes a significant emotional stress of individuals in the stress-coping-research. By Jetten and Branscombe (2009), it is helpful for individuals to cope with discrimination by identifying themselves with the minority and by emphasizing the difference between other minorities or to the majority group (Jetten and Branscombe, 2009).

Factors like lack of autonomy, role ambiguity or stressful working conditions as well as the culture influence the stress level of employees at the workplace (Jetten and Branscombe, 2009). These factors can have an impact on persons with an immigration background as well as on ageing employees. Ageing employees are often underestimated in terms of flexibility compared to younger employees, innovative capacity and handling with stress.

The research shows that diverse management guidance can influence the organisation's performance in a positive way and, therefore, diversity management is important for organisations.

3 METHODOLOGY AND DATA

This study is part of a bigger project, which grabbles with individual and organisational conditions for successful diversity. Especially the implicit attitudes of the employees in Germany are examined to determine the barriers of the implementation of diversity.

The explicit attitude pictures that diversity is desirable in Germany. But the attitudes of initiating an acting show clearly that people rather associate stress and reserves with diversity. For that reason the project is constructed as a two-stage study – a qualitative survey were conducted for generating hypothesis first and a quantitative study was following for reviewing these hypothesis. In this article the implicit attitudes of employees with and without migrant background are examined and compared. 18 employees with an immigration background and 15 employees without an immigration background from different organisations were interviewed by telephone regarding their attitude to cultural diversity, diversity and multicultural teamwork. The questions were asked in a direct an in an indirect way to verify the attitudes and to generate the hypothesis of research nearby reality and praxis. People of big organisations were asked because diversity management is existing rather in big German organisations. Also the number of people with migrant background is adequate to answer the research questions by the own results and not in a hypothetic way.

The explorative interviews enable to present the backgrounds and relationships between cultural diversity from the view of involved employees from different industries.

Thereby, it was analysed whether differences between employees with and without an immigration background and between younger and ageing employees exist.

The qualitative investigation is part of a big project to generate hypotheses for a quantitative investigation and to obtain specific measurements for a quantitative questionnaire. Therefore explorative questions wer asked, which were answered with the interviews.

A qualitative structured interview was selected as survey method. It allows to understand and analyse the diversity aspects of culture and age and its challenges. Furthermore, not-considered aspects from the research can be figured out. In this case e.g. how employees with and without an immigration background perceive multicultural teamwork and how important competences are in the present working world.

The anonymised interviews were analysed by applying the quantitative content analysis by Mayring (2015). Therefore, the material will be transcribed, categorised and generalised and analysed by Excel. The interviews were also analysed by the frequency analysis with the aim to count the elements of the material and compare their frequency with other elements (Mayring, 2015). The structured interviews do not include response categories except of some closed items and contains predominantly open questions. The structured interview is based on an interview guideline, which is formulated deductive, thus, theory-based.

The interview questions primary pertain to the handling with cultural ambivalent situations. The handling and communication with colleagues with the same and with other cultural background is focused. Other questions inquire which diversity measures are known by the employees – here it is important to mention that the data collection took place only in organisations that have diversity management concepts. But only the measurement of the implementation of a concept can verify if these concepts are successful or not. The employees were also asked about challenges with diversity and the relevance of diversity to get some hints for an implicit approval or disapproval of diversity. This shall be integrated into the quantitative study.

It is also important to evaluate the role of management and leadership for the handling with diversity and the assessment of the role of persons with immigration background for the organisation.

The interview guideline is structured as follows: The first partpart has asked the employees about their demographic data, e.g. age, gender, immigration background, business sectors and internationality of the company. Another part has related to questions about the issues of diversity, especially equal opportunities of persons with an immigration background, e.g.: "What do you associate with the term diversity?", "Which aspects does the term diversity include in your opinion?".

Furthermore, the employees were asked about the issue prejudices, discrimination and multicultural teamwork. The employees were asked whether discrimination exists in companies. Finally, employees with an immigration background were additionally asked whether they perceived discrimination in their private life or work life and to which area their statements referred. They could answer this question voluntarily.

The first explorative hypothesis is: Employees without an immigration background see more disadvantages in the multicultural teamwork than employees with an immigration background.

The base of the self-assessment is a Likert-scale. The closed questions were answered on a 5-Point Likert Scale, 1 = strongly disagree to 5 = strongly agree, by the respondents and derive from English-speaking questionnaires, which were translated into Germany by the method of retranslation, e.g. 'I would judge myself as being open to people of different cultures.'

In addition, the interview focused on the issue competence. Thereby, diversity competences were examined in detail. Another part of the interviews was the stress level and stressors of employees with and without an immigration background regarding diversity. Furthermore, the employees were asked about the effectiveness of diversity actions, inter alia diversity concepts that reduce prejudices against persons with an immigration background.

The aim of the interview's questions were to obtain knowledge about how employees and managers live and promote diversity, especially the equal opportunities of employees with an immigration background. Furthermore, it can be examined how effective and successful diversity actions are in practice. Thereby, the focus is especially on diversity competences and diversity attitudes of employees.

To verify hints for the second survey the closed questions were also evaluated. Therefore three hypotheses were tested:

- *Hypothesis 1:* Employees with an immigration background feel more comfortable to work with people from different cultures than employees without an immigration background.
- *Hypothesis 2:* Employees with an immigration background feel more familiar in dealing with persons from different cultures than employees without an immigration background.
- *Hypothesis 3:* Younger employees feel more familiar in dealing with persons from different cultures than ageing employees.

A qualitative structured interview was selected as survey method. It allows to understand and analyse the diversity aspects of culture and age and its challenges. Furthermore, not-considered aspects from the research can be figured out. In this case e.g. how employees with and without an immigration background perceive multicultural teamwork and how important competences are in the present working world.

The anonymised interviews were analysed by applying the quantitative content analysis by Mayring (2015). Therefore, the material will be transcribed, categorised and generalised and analysed by Excel. The interviews were also analysed by the frequency analysis with the aim to count the elements of the material and compare their frequency with other elements (Mayring, 2015). The structured interviews do not include response categories except of some closed items and contains predominantly open questions. The structured interview is based on an interview guideline, which is formulated deductive, thus, theory-based.

The closed questions were answered on a 5-Point Likert Scale, 1 = strongly disagree to 5 = strongly agree, by the respondents and derive from English-speaking questionnaires, which were translated into Germany by the method of retranslation, e.g. "I am open to people from different cultures".

The interview guideline is structured as follows. One part has asked the employees about their demographic data, e.g. age, gender, immigration background, business sectors, internationality of the company. Another part has related to questions about the issues of diversity, especially equal opportunities of persons with an immigration background, e.g. "What do you associate with the term diversity?", "Which aspects does the term diversity include in your opinion?". Furthermore, the employees were asked about the issue prejudices, discrimination and multicultural teamwork. The employees were asked whether discrimination exists in companies. Finally, employees with an immigration background were additionally asked whether they perceived discrimination in their private life or work life and to which area their statements referred. They could answer this question voluntarily.

The sample of the qualitative investigation consists of 18 employees with an immigration background and 15 employees without an immigration background. Thirteen of all are female and 20 are male. The average age of the sample is $M = 35.48$ ($N = 33$; SD $= 9.99$). The respondents work about $M = 9.29$ years ($N = 33$; SD $= 9.37$) in their organisations.

4 RESULTS

In the following, the results of the explorative survey will be presented: Employees without an immigration background see more disadvantages in the multicultural teamwork than employees with an immigration background.

The results show that both groups recognise the challenges of multicultural teams. However, employees without an immigration background see more disadvantages than advantages in multicultural teams compared to employees with an immigration background. According to the statements of both groups, particular challenges regarding the cooperation of persons with an immigration background are potential language barriers like "especially difficulties in understanding different languages as problematic". Different languages can lead to misunderstandings. Employees with an immigration background additionally mentioned following problem fields: cultural working methods and attitudes ("Well, I think that sensitivities in every culture are different and also what is important for the people. There are cultures, which need very strong confirmation by others. This is what I have been experiencing They have different hierarchical concepts.") Employees without an immigration background mentioned a different understanding of team culture and capacity of teamwork as well as social interaction as problems in multicultural teams. One employee without an immigration background said e.g. "I believe that every culture deals differently with a subject. Some people from other cultures are temperamental and have different approaches and values."

The results do not surprise although people with immigration background are also natives. Obviously, it is a wide spread negative stereotype to join cultural differences and divergent or insufficient language skills. This is also reported by people with immigration background. People assume those people with immigration background to have inferior languages skills even if this is not right.

The analysis of biculturalism of employees with an immigration background supports the results of the qualitative investigation. They answered the closed questions on a 5-point Likert Scale, 1 = strongly disagree to 5 = strongly agree. Employees have a strong connection to their ethnical group ($N = 16$; $M = 3.75$; SD $= 1.34$). Furthermore, they have a stronger connection to their ethnical group. But most of their friends are from Germany and their ethnical group ($N = 16$; $M = 4.44$; SD $= 1.03$). It is to be mentioned that the closest friends of employees with an immigration background do not have necessarily the same cultural background like themselves ($N = 15$; $M = 2.33$; SD $= 1.45$). In this sample, the employees with an immigration background are integrated in both cultures and feel mostly integrated (N = 18; $M = 4.44$; SD = 1.19).

This results are also verified in international research. The relation of acculturation and socio-cognitive functions is tested in the study of Tadmor et al. (2009). Bicultural persons were more integrative complex than adapted persons. One reason for this is that bicultural persons have better skills and can differentiate between competing cultural perspectives. They are able to integrate themselves to adapted individuals and separated individuals.

Employees with an immigration background list up following aspects as difficulties in the multicultural teamwork: social interaction, leadership, cultural conflicts, language deficits, intercultural perspective and work attitudes and different personalities. Employees without an immigration background point out that intercultural interaction, personality and generational differences are difficulties in the multicultural teamwork.

Apart from immigration background you can explain this behaviour with the classically theories of social psychology.

The theory of social identity indicates that members of within groups are evaluated more favourable than members of the foreign group. Positive successes are related to the within group. Negative behaviour is attributed internal to the members of foreign groups. Comparative cultural studies confirm that negative behaviour is attributed external in the within group. Negative expectations are established against members of the foreign group (Hewstone, 1988). This may explain why employees without an immigration background assess multicultural teamwork more negative and attribute the problems to employees with an immigration background.

An interesting aspect was mentioned in the interviews. It was the issue of envy towards employees with an immigration background. Employees without an immigration background partly regard employees with an immigration background with envy because they take the view that employees with an immigration background are preferred and get more support than others.

Employees without an immigration background mentioned the aspect of envy as well. One employee with an immigration background reasoned "envy [...] is a big factor and plays a huge role. Envy and fame as well as respect are important facts. Some people with an immigration background feel vulnerable when other people with an immigration background are around them because they felt as a unique before. When other people with an immigration background work with other people with an immigration background together, they feel envy and confronted by the other people with an immigration background because they might have the same qualifications as them. Envy is the biggest problem. Envy, respect and fame." Employees without an immigration background mentioned, furthermore, the aspect of fear getting in contact with employees with an immigration background. Prejudices and social categorisation can lead to distance between employees and can have an impact on the multicultural teamwork for half of the respondents. Uncertainty, ignorance and fear towards other cultures can also create distance between employees because the own culture can be swamped by the other culture and can lead to loss of identity.

The concept of envy is explored in the US research in relation to conflicts between white and colored people as well as between Latin-American immigrants and native population. It is verified with the theories of social dominance (Sidanius and Pratto, 2001) and realistic group conflicts. Through the explorative questions it becomes clear that the concept of envy looms large and so it should be considered for an examination of the quantitative issues.

Overall the respondents were largely satisfied with the multicultural teamwork (N = 11; $M = 4.73$; SD = 0.65).

In the following, the results of the quantitative hypotheses are presented.

Hypothesis 1: Employees with an immigration background feel more comfortable to work with people from different cultures than employees without an immigration background.

The results do not show significant differences. This is an indication that diversity is not perceived as a threat by employees or that the expression of intercultural competence is very high. This indication will be examined in the further quantitative research. The t-test confirmed the non-significant differences ($T = 1.24$; df 1; 21; $p = 0.068$).

Hypothesis 2: Employees with an immigration background feel more familiar in dealing with persons from different cultures than employees without an immigration background.

A t-test was conducted to verify this hypothesis. The results show high significant differences (Employees without an immigration background $M = 3.47$; SD $= 0.83$; Employees with an immigration background $M = 4.67$; $SD = 0.49$; $T = 5.157$; df 1; 31; $p = 0.000$). The differences indicate that the growth of intercultural competences is due to personnel background and experience. The quantitative results are supported by the evaluations of the qualitative investigation. E.g. quote of an employee with an immigration background: "[...] people with an immigration background have grown up at least with two cultures and different perspectives and competences. Therefore, we have a better understanding other people better."; "People, who have not experienced intercultural experiences, are also able to make perspective change by their seniority. [...] But I believe that experience is the most important thing in this context, e.g. experiences abroad or to know different contexts and cultures."

Hypothesis 3: Younger employees feel more familiar in dealing with persons from different cultures than ageing employees. This hypothesis was refuted because there is no significant difference between both groups ($T = -1.462$; df 1; 31; $p = 0.154$). The assumption that younger persons are more open for new experiences and, therefore, are more flexible and unprejudiced could not be confirmed. Intercultural competences are not influenced by age, but by personality traits.

5 DISCUSSION AND CONCLUSIONS

The results show that the significance of self-awareness and exchange of experience and the expression of intercultural competence increases. There are differences regarding the familiarity in dealing with other cultures between persons with and without an immigration background. Persons with an immigration background have more experiences with persons from other cultures. They often grow up with at least two cultures and, therefore, learned early to adapt to other cultures and to engage in it. The qualitative investigation clarifies that it is important for organisations to promote their employees and managers regarding intercultural competences. The age does not play a role regarding intercultural competences.

In this study it can be positively pointed out that a quite high diversification could be reached with a sample of 33 employees with and without an immigration background. The respondents work in small, medium-sized and large organisations where, on the one hand, diversity has already been implemented and, on the other hand, no diversity actions have been implemented. Furthermore, the employees were from different business areas throughout Germany. Based on the small sample, a large overview about the issue of diversity management could be given in Germany. Considering the importance of diversity and diversity attitudes of employees, especially the equal opportunities of persons with an immigration background and ageing people, allow to analyse disregarded aspects from involved persons. Bigger questionnaires can build upon the results of this qualitative study and examine the results in detail. The interview guideline gives a large overview of the different factors and the importance and attitudes of diversity in companies. However, the interview guideline should be extended on the basis of the results of the study and more detailed questions should be asked. Furthermore, the results should be examined by a quantitative study.

The interview guideline has covered many issues of diversity management. The combination of closed and open questions has increased the comparability of the interviews compared to interviews with only open questions. But the results of structured interviews are less comparable, inter alia based due to open questions, whereby the analysis is more difficult. The results would be more comparable, if a standardised, quantitative questionnaire was used and a higher sample could be asked. Nevertheless, the results would not be so diverse and multifaceted as with the selected interviews. The study could consider and differentiate the problem fields and diversity attitudes of employees with and without an immigration background in detail. The qualitative investigation was predominantly used for generating hypotheses. Therefore, the differences of the groups were only measured to generate hypotheses for a quantitative investigation. It provides approaches which have to be examined in detail in subsequent studies.

The following has to be criticised regarding the survey method: The interview guideline deals partly superficial with some topics of diversity. It could have been asked more, e.g. what kind of discrimination exist in organisations and which actions could help to reduce discrimination? The respondents are even though from different business areas and sizes. However, other companies can differentiate from the sample due to other characteristics, e. g. size, structure, implementation of a diversity department.

It is necessary to investigate the category systems of the interviews regarding their quality criteria. The interviews of the study were used for generating hypotheses for a quantitative questionnaire. Therefore, additional aspects regarding diversity, especially equal opportunities of persons with an immigration background, which are represented in the conventional quantitative research, could be measured.

The sample is evenly distributed regarding the persons with and without an immigration background. The following has to be criticised regarding the sample. There were more women than men who conducted the interview. Furthermore, the results only give approaches regarding diversity attitudes of employees with and without an immigration background. There is a strong East-West gap concerning the employment of migrants in organisations in Germany. This fact is reflected in the interviews. Not every respondent has been in contact with migrants in their work routine, when the interview was conducted. To get a representative sample, a more comprehensive sample should be made with employees in Germany. Furthermore, it should be examined how effective diversity actions are and to what extent diversity concepts should take a higher priority in personnel actions. The results showed that the priority depends on the business areas, size and the location of the company as well as the diversity of the staff.

It has to be considered, whether the answers were given due to social desirability or deliberate misrepresentation because the survey method was an interview. Some of the questions have been very personal and referred to perceived discrimination of employees with an immigration background in working and in private life. According to the statements of employees, around one third of the employees with an immigration background have perceived discrimination in their private life. The discrimination referred to outward appearances and their origin culture. The interviewed employees with an immigration background have not perceived discrimination in their work life according to the results of the qualitative investigation. Group specific development concepts help to reduce discrimination in companies according to the results.

The data of the interviews were anonymised. Therefore, the effects of social desirability could be minimised but it could still occur due to the social interaction during the interviews. This could lead to a distortion of the results because e.g. the individual responsibility or the skills of the own person were presented more positive. Therefore, the results have to be discussed critically. A deliberate misrepresentation can be excluded because the respondents participated voluntarily at the interview and did not have to expect any negative effects due to giving specific statements.

The qualitative results show a tendency to regional differences regarding the importance of diversity and that diversity attitudes of employees exist. The results can occur to what extent employees are grown up in a multicultural context and how open the environment is. Prejudices against persons from another culture can be partly reduced by implementing diversity concepts. The results of the interviews indicate that such concepts are generation-dependent and location-dependent. The younger generation grows up in a multicultural society in Germany and in Europe. Therefore, they bring certain intercultural competences into their work life. Diversity plays a more important role for organisations. But there can be the risk of negative connotation. The interviews showed that in the western part of Germany, e.g. in the Ruhr area, such a diversity concept for equal opportunities of migrants would be superfluous because there is a high proportion of migrants and it is normal to work with different cultures together.

In summary, there is a high demand of competence development, especially regarding intercultural competence and social competence. Social competence facilitates the collaboration with persons with an immigration background and employees learn to experience a change of perspective. The results of the study show that personality traits and characteristics of employees play a role to what extent employees accept diversity and are willing to work with persons from another culture. Age does not play a role regarding intercultural competence development. This means for organisations to offer trainings and seminars for the issues of culture, stereotypes and intercultural competences and to support as well as experience abroad and foreign assignment.

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CYBERSEXUAL HARASSMENT AS ICTS DEVELOPMENT CONSEQUENCES: A REVIEW

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EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 4 Issue 2
ISSN 2336-6494
www.ejobsat.com

ABSTRACT

Rapid progress of information and communication technologies (ICTs) affected the evolution of sexual harassment. Cybersexual harassment can be exposed via social media but as well might be a tool for harassers to attack or stalk individuals after anonysmously. This evolution of phenomenon enter to virtual reality require changes in differenr levels: individual, enterprise and state to counter the hybrid threats. The proposed conceptual framework reflects the main vulnerable groups, consequences. These main aspects trigger for the development of ICTs in order to change organizational policies, political and security regulations.

KEY WORDS

cybersexual harassment, cyberbullying, cybercrime, hybrid threats

JEL CODES

M1, D8, D74

1 INTRODUCTION

A rise of social media and networking has made faster access to information and engage to communicate through tweet, post, Instagram, sharing various content on Facebook, making Tumblr blogs or Youtube videos. Individuals have the voice to tell their story in a massive scale via different mobile applications by making digital messages more personal and intimate. Also and broadcast specific moments live.

However, the viral spread of information leads to power imbalance of specific individuals who are targeted against social norms and express revolutionary ideas, attitudes and insights. The scholars highlighted that there is a need of cybersexual harassment prevention among adolescence (Pereira et al., 2016) and university students (Moafa et al., 2018). Mainiero and Jones (2013) develop new communication ethics in order to prevent work-

KUKLYTĖ, Jūratė. 2018. Cybersexual Harassment as ICTs Development Consequences: A Review. *European Journal of Business Science and Technology*, 4 (2): 187–195. ISSN 2336-6494,
DOI http://dx.doi.org/10.11118/ejobsat.v4i2.137.

place romances that may subsequently turn into workplace sexual harassment through the use of social networks and other forms of digital communication between employees. The interest among academicians is growing. Kuem et al. (2017) tested what different aspects which may have significant effect and may lead to prosocial behaviour in social networking services. Misbehaviour in social networks has gained public attention and encourage to report of cybersexual harassment to legal instutitions.

Furthermore, cybersexual harassment, including cyber-porn, obscenity, sharing sexually expressive illegal content or activities, are identified as a cybercrime (Holt, 2018). These actions play a key role to digital diplomacy. According to Surma (2016) international conflicts may be started by using "Factories of Trolls" in order to use provocation strategy to manipulate public opinion of specific country. Hybrid threats are complex like cyberattacks, alienation, extortion of confidential information, cyberbullying, cybersexual harassment and others.

This research aims to broaden the understanding what are the major threats and consequences of cyber sexual harassment in different levels. Following the aim of this research the main attention was gained, how cybersexual harassment perception evolved and changed in different level. By intending to investigate a research gap, following questions were formulated:

RQ_1: How cybersexual sexual harassment evolve?

RQ_2: What are the main vulnerable groups and consequences in different levels?

2 BACKGROUND OF CYBERSEXUAL HARASSMENT

Sexual harassment became an important issue and throroughly analysed as face-to-face actions. Interpretive way reveal multiple realities, which are socially constructed by different workplace environments – academia (Carstensen, 2004), military (Matheson and Lyle, 2017), private sector organizations (Sarpotdar, 2013).

Moreover, hermenautical delectical analysis could be employed based by the concept of Gramsci hegemony that social practice construct the actions and desires excluding personal interests and values by analyzing the nature of sexual harassment and cybersexual harassment (see e.g. Hatch and Cunliffe, 2006). Dialectical perspective reveal that deviant behaviors can be seen as mimicry. According to Bhabha (1997), "mimicry emerges as the representation of a difference that itself a process of disavowal." Also mimicry is defined as "the sign of a double articulation, a complex strategy of reform, regulation and discipline, which "appropriates" the Other as it visualizes power". Such complex nature is shown in some researches. Lindberg et al. (2012) revealed that the Finnish adolescents who "expressed their massacre threats online as cybersexual harassment could be considered a riskier group than the group who expressed the threats offline".

Cybersexual harassment involves destructive electronic means mediated communication such as e-mail spoofing, stalking, cyber sexual defamation, cyber flirting, hacking, cyber pornography, and cyberbullying. Moreover, similarities, differences and interrelationship of cyberbullyinh and cyber sexual harassment were exposed. Akbulut and Eristi (2011) highlight that cyberbullying can be expressed through flaming, sexual harassment and stalking. Also it includes verbal and visual social and relational aggression like harassment, denigration, sexting, posting embarrassing photos or memes (Ballard and Welch, 2015). Vveinhardt and Kuklytė (2017) online misbehaviors in three types: violent and pornographic content, threats and vulgar language, and grooming. Thus, both phenomena are tend to refer as cybercrime by having tripple nature – could be expressed in a direct, indirect and mixed ways. Thus, extensive literature review and synthesis required in order to identify the targeted groups, possible threats, and consequences in different levels.

3 CONCEPTUAL FRAMEWORK

The use of various social networks and online technology is increase and transform the phenomena of sexual harassment in various perspectives. The provided model of cybersexual harassment aims to contribute conceptual understanding what are vulnerable groups, what could be consequences in different level (Fig. 1).

State level showed the incidents of cybersexual harassment operating at digital diplomacy level as a hybrid conflict – massive cyber attacks against minorities (children, adolescents, women) to cause socio-demographic problems and influence political issues without use of army force (Maurer and Janz, 2014).

Interpersonal level defines cyber sexual abuse among non-related individuals. Innapropriate dissemination and gender discrimination may appear among children, adolescents, students and virtual agents in different electronic environment – social networks and video games. The main intention is to initiate and engage a video connection or face-to-face meeting with the victim. Furthermore, the high level anonymity and power imbalance enable long lasting destructive communication which may cause psychological damage.

Enterprise level represents analysis of employees' misbehaviour in social networks. These offensive actions targeted against gender issues are analysed as deviant behaviors in computer-mediated communication (Ritter, 2014). Cyber incivility and online sexual harassment among employees has been analysed by Giumetti et al. (2016), Park et al. (2018) and others. Such an extent of spread of cybersexual harassment may cause financial and non-financial damage, also harm the well-being of employees.

According to Lewis et al. (2017), cybersexual harassment is an extention of offline sexual violence against women. Cyber-aggression among adolescents tend to have a sexual nature regarding the gender such as getting an unwanted sexual message from somebody or receiving sexual request by an adult may cause social-emotional consequences (Shapka and Maghsoudi, 2017). Several researchers argued that cybersexual harassment can adversely affect the organization (Ritter, 2008) and has a negative professional and economic outcomes for victims. Gamergate's misogynist scandal have revealed that social networking may play a key role of online abuse in conflicts that enable to gain a public and technological power (Salter, 2018). Moreover, massive attacks of cybersexual harassment messages targeted against minorities can be used as political tool to start hybrid or information warfare. Thus, cybersexual harassment is analysed in different contexts by using various keywords.

The scientific literature review enable to divide victims: women, adolescents, students, virtual agents, employees.

Tab. 1 represents cybersexual harassment among individuals who are not subordinated by specific job agreements. On the other hand, one group of victims – university students – has an intimate relationships with a perpetrator. These online actions affect interpersonal level.

Cybersexual harassment activities conducted in social networks during leisure time or on a daily basis may evolve to on-duty activities in different organizations (Maneiro and Jones, 2013). Although, outcomes of individual online misbehaviour may have negative impact on socio-demographic factors.

The most vulnerable victims group is adolescents (Tab. 1). Malicious online activities may defined as "online sexual solicitation", "Internet-initiated offense", and "online sexual grooming". Sklenarova et al. (2018) analysed 2238 adolescents (14–17 years) in Germany and found that some participants (24.7%) reported about online sexual experiences with peers and/or adults, 43.3% reported of exchanging pictures and 6.2% had engaged in cybersex.

Another group of victims are women. A considerable evidence shown that women experience cybersexual harassment and interpersonal misbehaviour is more often observed in individual level (Vitis and Gilmour, 2017; Ritter, 2014; Ritter, 2008). Women tend to experience online misbehaviour in various environment like blogs (Eckert, 2018), video games (Ballard and Welch, 2017) and other.

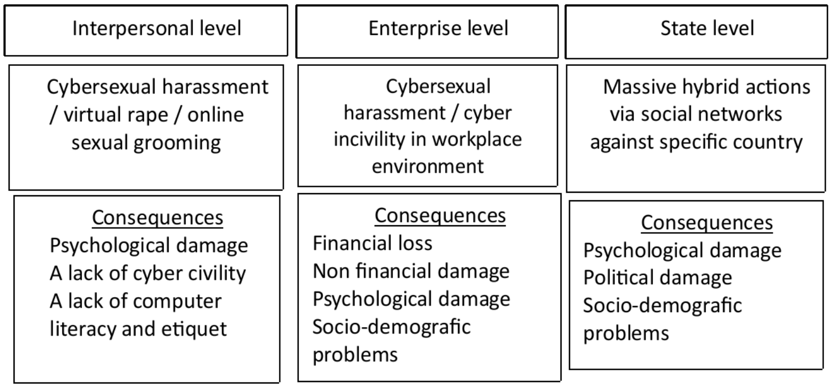

Fig. 1: The model of cybersexual harassment in different level

Less common online misbehaviour is virtual rape in a two or three dimentional environment. The first virtual rape case LambdaMOO was discussed in 1992. Spence (2012, p. 125) argued that "an avatar as virtual representation of an individual in reality can and must be perceived as a virtual purposive agent that have moral rights and obligations similar to those of their real counterparts. With regard to agency those rights are merely prima facie but with regard to personhood framed around the notion of self-respect those rights are absolute." According to Wolfendale (2007) virtual world is based to performative utterances and have illocutionary force (intentional virtual agents actions) and perlocutionary force (virtual agents have significant social effect). Warren and Palmer (2010) mentioned in Australian Institute of Criminology report that a female user of "Second Life" (3D game) informed Belgian police that her avatar had been raped in May, 2007. It is affirmed that "the rape of an avatar may produce some real-world physical discomfort or shock among unsuspecting or novice users" (Boellstorff, 2008). On the contrary, Fox et al. (2015) assert that virtual rape is understudied phenomena and claim that women's self-objectification lead to increases of rape myth acceptance.

Enterprise level represents organizational context. Online communication such as cyberbullying among adults (Lowry et al., 2016), cyber sexual harassment (Choi and Lee, 2017) among employees during working hours can be identified as on-duty deviance and off-duty deviance (Lyons et al., 2016). Moreover, cyber incivility through e-mail messages tend to have a double-edge sword effect (Lim and Teo, 2009). It can be illustrated by the case of women bloggers when they response with a humour creating memes and posts after online abuse (Eckert, 2018). This coping strategy is giving the same online abuse response to the perpetrator. Thus, a victim switches the roles and becomes a harasser.

Also online sexual aggression as an expression of misogynistic culture after GamerGate hate speech campaigns when female game developer Zoe Quinn was receiving death threats, threats of rape, and many harassing comments after an accusation of her ex-boyfriend that she had been given sexual favors for positive game reviews (Kaplan, 2014). Misogyny and homophobia may have impact on online aggression among massively multiplayer online game players (Ballard and Welch, 2017).

Cyber incivility and job subordination expressed in "not safe for work" (NSFW) blogs like tumblr.com may jeopardise the status of employees. Tiidenberg (2014) presented a case study of male sexual dominance by using the image of suit – tie combination and focusing on crotch area adding a caption: *"I think it's time you took some dictation. Clearly, I need a secretary to assist me."*

Louderback and Antonaccio (2017) extended typology of online misbehaviour by adding human and computer interaction issue –

Tab. 1: Conceptual analysis of cybersexual harassment in interpersonal level

Keywords	Definition	Victims	Source
Online obsessive relational intrusion	"The use of social networking sites, blogs, and other technologies to gain greater information, awareness, and knowledge of their partner's online and offline activities."	University students	Marganski and Melander, 2018
Online sexual aggression	An online actions when males use various coercive strategies to engage the women in consensual sexual activities.	Women	Strikwerda, 2015
Online sexual harassment	"Number of manifestation like revenge pornography, non-consensual sexting, cyberstalking, sending unsolicited nude images and sexually violent threats and harassment over online platforms such as gender-based hate speech."	Women	Vitis and Gilmour, 2017
Online aggression	A systematic abuse of power using electronic technology. It includes verbal and visual social and relational aggression like name-calling, sexting, posting embarrassing photos or memes, stalking and impersonation.	Gamers	Ballard and Welch, 2017
Online sexual solicitation	"Online risk behaviors like sexting, relating to strangers through the Internet, time using internet, using chat rooms, and adding strangers to social network friend lists."	Adoles-cents	Gámez-Guadix et al., 2018
Internet-initiated offense	Offensive actions that consist of enticing child into a sexual relationship or sexual gratification by using Internet communication platforms and fantasy-enhancing items like web camera and others.	Adoles-cents	Kloess et al., 2017
Cyber-interpersonal violance	Online harassment that consists of spreading of rumors, unwanted sexual photos without consent, and/or threatening individuals, and cyber impersonation.	College students	Choi and Lee, 2017
Technology-facilitated abuse (cyber violence)	Online actions enable abusers to overcome geographic and spatial boundaries that would have otherwise prevented them from contacting victims. Forms of domestic violence in electronic environment like cyber-stalking, non-consensual sexting and cyberbullying.	Adults	Al-Alosi, 2017
Virtual rape	"Virtual act of forcing sex upon an unwilling person in virtual environment."	Virtual agent	Strikwerda, 2015
Virtual rape	An unwanted sexual intercourse in order to harm the avatar in virtual environment.	Virtual agent	Young and Whitty, 2010
Online sexual grooming	An online manipulation process when offender creates circumstances to sexually abuse or exploit a child by earning the trust and initiating intimate physical contact with the victim.	Adoles-cents	Shannon, 2008

computer-focused digital deviance that is a consequence of a lack of technological mindfulness (Maier et al., 2017).

Another important aspect is that initiated massive cybersexual harassment attacks through social networks may work as a tool of digital diplomacy to seek control and power in state level. According to the European Parliamentary Research Service Blog, hybrid threat can be defined as "a phenomenon resulting from convergence and interconnection of different elements, which together form a more complex and multidimensional threat". It is very complex in terms of nature of challenges, multiplicity of actors involved and diversity of (un)conventional means used (i.e. military, diplomatic, technological). Thus, hybrid threats involve the cyber incidents and actions. The European Centre of Excellence for Countering Hybrid Threats categorize hybrid threats based by three aspects. Firstly, hybrid threats are "coordinated and synchronised action, that deliberately targets democratic states' and institutions systemic vulnerabilities, through a

Tab. 2: Conceptual analysis of cybersexual harassment in enterprise level

Keywords	Definition	Victims	Source
Online abuse	"A crime that include intertwined online-offline communication and gendered, raced constructions of who is privileged to speak publicly in which way."	Women bloggers	Eckert, 2018
Cyber incivility	Widespread and discourteous treatment among employees that occurs via information and communication technologies. E-mail and text messages refer as uncivil behaviors.	Employess	Giumetti et al., 2016
Cyber incivility	"A day-level incivility via work e-mail."	Employess	Park et al., 2018
Cyber incivility	"A communicative behaviour exhibited in computer mediated interactions that violate workplace norms of mutual respect."	Employess	Lim and Teo, 2009
Cyber sexism	A phenomenon when women are putting off careers.	Women	Foster, 2015
Computer-focused digital deviance	It includes cybercrimes such as cyber offending, damaging sensitive data and online malware.	Employees	Louderback and Antonaccio, 2017

wide range of means". Secondly, it is related to the activities that exploit the thresholds of detection and attribution. Thirdly, different forms that may effect decision making at the state, or institutional level to realize the agent's strategic goals in order to undermine the target.

The increasing interests of hybrid conflict when interested parties may use technological means to exploit social, economic or political vulnerabilities leads to the main question how to counter the hybrid threat (Maurer and Janz, 2014). What if cybersexual harassment could be seen as a social vulnerability. The cyber perpetrators may use bots, specific algorithms or "factory of trolls" to spread massive panic and increase level of suicide in specific country.

In addition, cybersexual harassment is interpretated differently in various levels and may have different antecedents, outcomes to pursue specific objectives of perpetrator.

4 DISCUSSION AND CONCLUSIONS

The analysis and synthesis of scientific literature review provides a specific discource of cybersexual harassment in different levels by specifying victims and targeted groups. This paper contributes to the conceptual development of cybersexual harassment and expresses a deeper research interest, motivation and practical implications in public and private sectors.

The developed model broaden the conceptual understanding if we defining it to the multi-level framework of interpersonal mistreatment (Cunningham et al., 2007). This methodological approach is extended in different contexts – daily cyber aggression among non-related individuals, job relationship subordinated individuals and specific country level in terms of hybrid threat to harm the marginalized or the weakest group of individuals. According to Arcos (2018), target audience segmentation and preliminary research and analysis play a key role in order to identify targeted publics, that is important to overt and covert disinformation and propaganda campaigns. The constructed model showed three unique perspectives of cybersexual harassment: interpersonal level, enterprise level and state level. The presented conceptual framework is important for further investigations in order to prevent negative outcomes in terms of countering the hybrid threats (Bachmann, 2011).

ICTs, Internet of Things, Big Data and cyber-physical systems are influenced major changes in the context of Industry 4.0 by considering technical aspects, human interactions and development of new business models (Navickas et al., 2017). Cyber-physical systems are used by hackers in order to reach sensitive data or raw information of individuals or fully automatated enterprises. Moreover, it could be used as a tool to start a hybrid warfare. The provided conceptual framework of cybersexual harassment could be useful to maintain organizational policies, security strategies, technological solutions for development of counter-measures and building resistance.

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AN ANALYSIS OF EXPECTATIONS IN INDUSTRIAL VALUE ENGINEERING PROJECTS

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EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 4 Issue 2
ISSN 2336-6494
www.ejobsat.com

ABSTRACT

This exploratory study addresses the need to identify specific and holistic upfront expectations into industrial value engineering projects for best tailored preparation of an efficient project execution. The analysis includes a total base population of 90 projects, which were conducted between 2010 and 2018 in 16 different industries. Out of those, 63 projects had a narrower value engineering context and have been analyzed with the support of a CAQDAS tool (Computer Assisted Qualitative Data Analysis Software). Analytical results show that participants' expectations in value engineering projects vary depending on their industrial environments, but cope with existing studies on critical success factors for project management. Based on the findings the author recommends further research on fast project execution, closing the gap between training- and project content as well as emphasizing the necessity of rigor with regards to the utilization and application of terminology, which includes sharpening the correct interpretation of value engineering, its tools and contents.

KEY WORDS

value engineering, project expectations, content analysis, CAQDAS

JEL CODES

O310, L230

1 INTRODUCTION

This introduction covers three aspects. First, in order to avoid and prevent misunderstanding and to foster a common clear understanding of the origin and the potential impact, the term 'value engineering' is elaborated in the literature review.

Second, as this analysis' driving force, the author's personal practical experience and arbitrary observations let one assume that a

TESCHL, Erhard. 2018. An Analysis of Expectations in Industrial Value Engineering Projects. *European Journal of Business Science and Technology*, 4 (2): 196–215. ISSN 2336-6494,
DOI http://dx.doi.org/10.11118/ejobsat.v4i2.139.

high degree of freedom rules practitioners' and stakeholders' interpretations and expectations in value engineering projects. On the same page, not all past projects have been closed with full satisfaction. But the analysis within this environment seems to show repetitive patterns. The consecutive question arises, if the project setup and planning preventively could have been prepared a better way upfront. A strong alignment of value engineering projects along project management's basic principles is evident.

Third, this analysis is based on a data collection, which was gathered during the last decade by the author as unique source. The general validity, its restrictions and limitations of this base require careful consideration. On the other side, the given set of data allows analysis, understanding and comparison of different industrial environments.

Therefore, this analysis provides insights into contemporary and subjective environment-dependent interpretations as well as improvement proposals for future value engineering projects' setup and upfront planning, including the consideration of participants' expectations in terms of potential goals, procedures and execution.

2 RESEARCH OBJECTIVE AND RELEVANCE

This research's relevance is based on three distinctive aspects. Generally, it aims to explore practical interpretation and application of value engineering projects in the industrial environment. The guiding idea is to analyze and understand upfront expectations into value engineering projects, in order to address them the earliest possible moment. This shall raise satisfaction with the projects and its results.

The first detailed supportive aspect of this study's relevance deals with the necessary precision of wording and terminology in order to enable exact and correct interpretation. It is relevant to embrace the contemporarily interpreted identity of any term, in this particular case the term "value engineering", in order to enable oneself to talk about this term with any other person without creating misunderstandings. One main force behind this research was the author's experienced increase of projects, which were labelled "value engineering", but pursued other non-value-engineering objectives as any other random project following loose, unclear and unbinding definitions. Any wrongly or imprecisely labelled project might lead to misconception and disappointment, if the label is used as a generic "one-for-all umbrella-term". This paper shall support sharpening the use and interpretation of the terminology by understanding contemporary interpretations and project expectations.

The second underlying aspect of relevance consecutively derives from the first one and deals about the best possible upfront preparation to potential expectations in upcoming projects. It is about the awareness of the spoken and unspoken objectives, goals and expectations, within and beyond imagination of all participants and stakeholders. One could argue, that it finally would not matter from the viewpoint of project success, which labels the assigned projects finally are given or which tools are being applied, as long as the project focal point, objectives and expectations are defined thoroughly and precisely for the sake of most efficient and successful project execution. Projecting this aspect even on to external influences, value engineering projects hypothetically and theoretically could be influenced by new trends or collateral effects, which were not covered back in the time, when value engineering was defined. There might be a new mainstream, which is worth being detected as collateral benefit of this work.

The third underlying aspect of relevance deals with general difficulties to compare different industrial project environments within one study due to restricted data access. This paper offers a unique opportunity to do that (in a limited way, and to compare different industrial project environments and uncover differences.

3 LITERATURE REVIEW

The idea of Value Engineering (VE) was initiated and formulated during the 1940s by Lawrence D. Miles (Lawrence D. Miles Value Foundation, 2016). Now it is manifested as a norm and as an internationally recognized standard in the European Community (DIN – Deutsches Institut für Normung, 2002) as well as on the American continent (SAVE International, 2018). The underlying core principle of the VA technique, as explained in these fundamental documents, is based on methods of the technical value- and functionprinciple and interprets the term "Value" as function-cost-ratio (SAVE International, 2018), a trade-off between utilization of a part and its cost of creation.

Value Management (VM), according to DIN EN 12973 (DIN – Deutsches Institut für Normung, 2002), is manifested in an international normative. There, it is defined as a management style, which has been developed from methods based on the value- and function-principle. Nowadays the utilization of the terms Value Management (VM), Value Analysis (VA) and Value Engineering (VE) is based on the same concept and applies the same toolset. According to Springer Gabler Verlag (2016a), the techniques VA and VE are being applied at different stages of a product's life cycle. VE is being applied during the early concept-, development- and engineering phase, where the majority of the cost still can be influenced before their allocation. In contrast, VA rather analyses and optimizes products, which are already readily developed, launched and produced on existing facilities with lower savings-impact and at costly design changes.

The main distinctive characteristics of the VE approach from other approaches is a strong primary focus on the customer, the customer requirements, the customer expectations (translated into customer functions) and an overall cost-optimization-thought. Miles (Lawrence D. Miles Value Foundation, 2016) quoted the challenges and core thoughts for VE as follow: *"All cost is for Function"* and *"Instead of thinking and talking in terms of 'things,' Value Analysis changes the thinking process to 'functions'."* From a practitioners' tool perspective, the VE-approach technically takes advantage of thinking in higher levels of abstraction by neutrally defining a product's functions and thinking in those.

In its very beginnings, VE aimed on improving the value of existing products, in terms of reducing and eliminating unnecessary cost. Later, it shifted its focus additionally towards functional improvement of a product, simply said: making its features better. Nowadays, VE is being applied on products, services, projects and administrative processes, regardless of their development maturity along the entire product life cycle.

VE is defined as an organized, systematic and cross-functional team approach with the objective to provide the required functions at lowest overall cost (DIN – Deutsches Institut für Normung, 2002). VE pursues a holistic integrative solution system. The required quality, performance, reliability, performance and market acceptance of a product are not being sacrificed for the sake of cutting cost or cheapening a product only.

With cross-reference to product development, Ibusuki and Kaminski (2007) as well as Unger and Eppinger (2011) and Ho and Lin (2009) recommend utilizing VE, together with the principles of target costing, concurrent function deployment and concurrent engineering for product development processes.

In the United States and Canada, the application of VE shows a long mandatory project track in private, federal and governmental organizations (SAVE International, 2018). The Public Law 104–106 (104th Congress, United States of America, 1996) even mandates the application of VE for public procurement projects, for instance on construction, traffic, road construction, defense, security and space flights.

VE has a long history on its transition from pure cost optimization towards standardization and application in various industries, products, services and along the entire product life cycle.

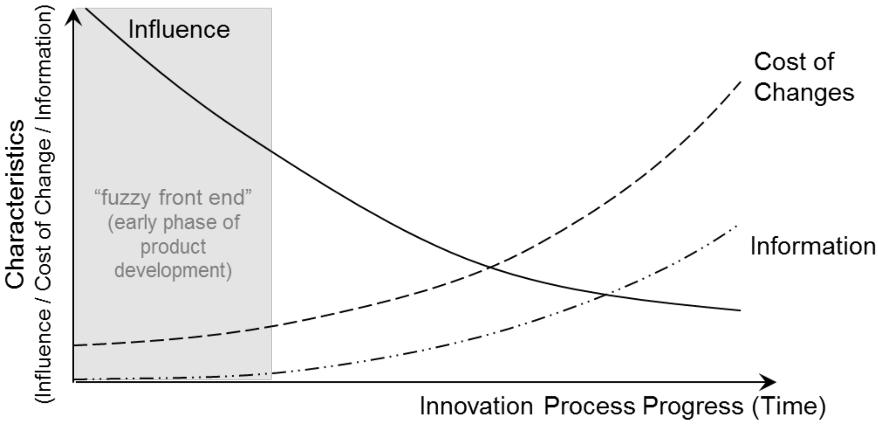

Fig. 1: Development of influence for change, cost of changes and information level along the innovation process progress (source based on Jahn, 2010; Herstatt and Verworn, 2004; von Hippel, 1993; modified by the author)

During the early innovation phase (see Fig. 1, "Influence" zone "fuzzy front end" during the very early phase of product development, sources stated below) design changes can be implemented relatively easy at lower change cost in comparison to design changes at a later point of time, where change cost are higher due to already allocated cost, such as already invested design-labor, material, machines, jigs, fixtures or tools among others – compare Jahn (2010), modified from and referenced to Herstatt and Verworn (2004), itself based on von Hippel (1993), see also Fig. 1.

Even though not stated anywhere explicitly within the standard, it is obvious, that the work plan of a value study (DIN – Deutsches Institut für Normung, 2002, p. 22ff) fulfils the definition of a project (Springer Gabler Verlag, 2016b). Any VE project is built on a clear project management setup.

Timewise on parallel to VE, Project Management has been developed as a generic management model (Atkinson, 1999; Müller and Jugdev, 2012) on its transition towards formalization and institutionalized standardization (Garel, 2013). This development path ever since was paired with the search for critical success factors, as elaborated by Müller and Jugdev (2012), who have analyzed and summarized the contribution of Pinto, Slevin and Prescot as (in their view) popular and dominant authors in the field of Project Management. In their summary on research referring to project management success factors, they have identified "impact on customers" and "business success" among others, which refer back on key features of VE, themselves. Lim and Mohamed (1999) reconfirm in their exploratory studies, that project success mainly depends on stakeholders' perspectives and has different meanings to different stakeholders. This copes with the above stated author's personal experience. Frefer et al. (2018) compare the findings of Pinto and Slevin (1988) on projects' critical success factors with other researchers' conclusion (Freeman and Beale, 1992; Khosravi and Afshari, 2011; Bryde and Robinson, 2005; Bahia and de Farias Filho, 2010; Al-Tmeemy et al., 2010; Mukhtar and Amirudin, 2016; Gomes and Romão, 2016; Omer, 2017), shown in adapted Fig. 2. "Time", "Cost", "Customer Satisfaction", "Effectiveness & Efficiency", "Requirements & Specifications", "Quality" and "Health, Safety, Environment" were identified as critical success factors by more than half of the researchers.

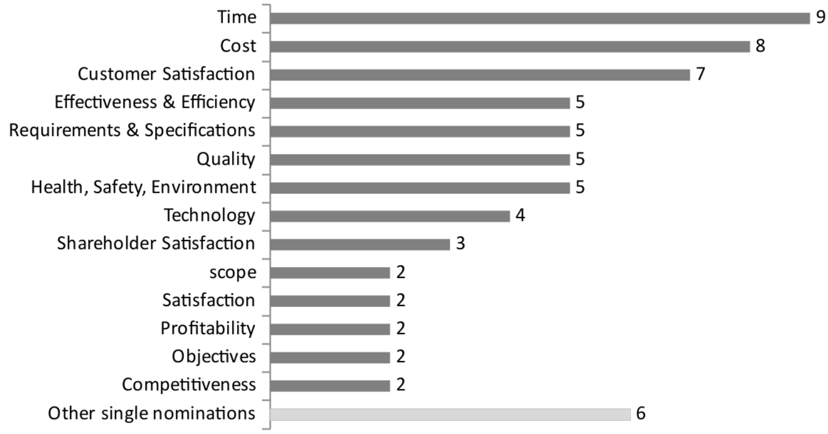

Fig. 2: Quantitative summary of success factors in projects (source based on Frefer et al., 2018; modified by the author)

4 RESEARCH DESIGN

The main goal of this analysis is to explore different aspects of project expectations and their impact direction for industrial value engineering projects.

Under the assumption, that project expectations of one specific project environment can be transferred from past and projected on future projects in a similar project environment and setup, also conclusions from past can be transferred and may be verified with future projects.

The analysis of this (past) information shall serve as improvement base for future value engineering projects' setup. This includes the consideration of participants' "ex ante" expectations (in the meaning of "original, before the project was started and not influenced by external factors") in terms of potential goals and on top of the hard project content goals, procedures and execution of the projects itself.

It is the goal of this analysis to identify the different aspects of upfront expectations into projects, which is linked to project satisfaction.

Therefore, this analysis' research question is: "What was past industrial VE projects participants' real upfront comprehensive, contemporary and particular expectation in those projects?"

This research has an exploratory character. There is no upfront knowledge available, there are no given parameters nor variables to examine (Creswell, 2009, p. 18). Creswell (2009, p. 194) takes reference to Locke et al. (2013): *"The intent of qualitative research is to understand a particular social situation, group, …"*. Based on the given subjective baseline, the inductive constructionist research approach was chosen. Silverman (2017) defines it as focusing on social processes and constructing the reality socially by applying "How?" questions.

This is supported by the specific characteristics of the given research environment, which calls for qualitative research (Creswell, 2009, pp. 175 and 195). There is a natural setting, in which the author shall experience the issue when collecting input. The author is active part and a key instrument of research himself by observing behavior and interpreting when collecting data. With regards to VE projects, there are multiple sources of data, which need to be compared. By organizing the identified data from bottom-up, an inductive process is installed with working back and forth between sources, codes and the levels of abstraction. The research design is emergent and being developed during the research itself. It is not described a detailed way before beginning. The research topic demands a holistic view in terms of combining and comparing the findings of each single project stream.

For reaching the research objective, it is more important to fully understand the research field, opened by the various cases, than to focus on and apply methodologies (Creswell, 2009, p. 10). The author wants to identify and understand the dependencies, connections and exclusions between these different projects/cases and its expectations. This research objective does not require providing a post positivistic proof of a hypothesis, which cannot be identified based on the given starting base line.

Qualitative research has gained importance and application within social science, psychology and medical research in general during the last decade, where quantitative research was dominant and preferred before. Malterud (2001) underlines the importance of 'interpretive action' to be included in medical research, while Lamnek (1995) sees the advantage, that the interpretive procedure allows the reader or observer to uncover background information, which would not be possible with a quantitative approach. The content analysis as a forerunner of qualitative research comes from communication science and provides a procedure to analyze big amounts of textual material (Mayring, 2010). According to Mayring (2010), the qualitative content analysis combines the technical knowhow of, how to deal with lots of textual material, with the capability to perform interpretive and verifiable text analysis.

Creswell (2009, pp. 185–191) summarizes the key points for qualitative data analysis and interpretation as an ongoing process with continual reflection about open ended data, which has to be collected, organized, analyzed and structured by "coding" (which means to categorize), arrange the codes within a framework to start to form a theory and interpret the findings. The continual reflection from different perspectives is the base for triangulation of different data in order to provide validity.

In her introduction to Grounded Theory, Charmaz (1996) describes the means and procedures of qualitative studies as *"… a set of inductive strategies for analysing data. That means you start with individual cases, incidents or experiences and develop progressively more abstract conceptual categories to synthesize, to explain and to understand your data and to identify patterned relationships within it. You begin with an area to study. Then, you build your theoretical analysis on what you discover is relevant in the actual worlds that you study within this area."*

Following Silverman (2017, p. 326), the research strategy follows 4 steps: (1) focus on high quality date with easy access; (2) focus on one process within that data only; (3) narrow down to one part of that process; (4) compare different sub-samples of the population.

The only focal point for the research at hand was set within the above mentioned research question. Other potential areas of interest for studies, as for instance, success factors, success rates, and financial benefits of projects, organizational setups, and hierarchical support among others were not followed and specifically excluded. The only topic of interest was any potential upfront expectation into the project.

The inductive approach of qualitative content analysis was mixed with quantitative insights, in order to enlarge to a mixed methods approach. Silverman (2017) and Saldana (2016) underline the useful support of a CAQDAS (Computer Aided Qualitative Data Analysis Software) for such studies. The chosen software for this study is MAXQDA.

Applying triangulation supports this research in different ways. First, by analyzing the research question from different viewpoints, new knowledge is created (Flick, 2008). Data triangulation supports the research validity: *"… by combining methods and investigators in the same study, observers can partially overcome the deficiencies that flow from one investigator and/or method. (…) In this respect triangulation of method, investigator, theory, and data remains the soundest strategy of theory construction."* (Denzin, 1970). In this research, multiple cases from multiple industries and multiple different projects serve as subjects for this study and provide *"rich data"* (Silverman, 2017).

Fig. 3 demonstrates the study's design. It combines Silverman's (2017) 4-step approach and Charmaz's (1996) procedures. In a first step, appropriate projects from the author's professional past practice were identified, which

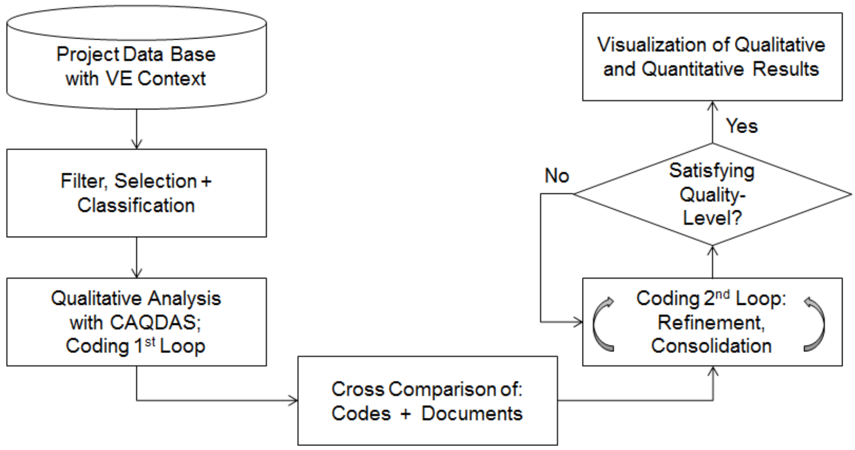

Fig. 3: Design of study

potentially could contribute to the research question. Filters were applied to focus on the most appropriate set of project data (see next sub chapter below). Then a Qualitative Content Analysis with first cycle coding according to Silverman (2017), Miles et al. (2014), and Saldana (2016) was applied by searching each single case by case for any potential hint on contribution to analyzing or answering the research question. Any identified information fragment was marked with codes. These codes emerged from the content and describe and summarize the content of the identified information fragments by descriptive notes. The MAXQDA software facilitates cross comparing the content of all identified information fragments of one code. Doing so, the coding was refined and consolidated in a second cycle coding, loop by loop. The software also supports cross comparison of the results of different document groups. Different combinations of document groups with codes finally were visualized a qualitative and quantitative way.

4.1 Sampling Technique

Due to the exploratory character of the study the author has applied purposive convenience sampling technique (compare Arber, 2001; Bryman, 2012; Denzin and Lincoln, 1994; Silverman, 2017). The samples conveniently were already available and accessible, which favored the examination of a larger population due to the timeadvantage. The selected base population for this study is all available cases, they are *"naturally occurring data"* (Miles et al., 2014), as most comprehensive and representative population (Arber, 2001).

According to Silverman (2017), the choice of cases for qualitative research should always be theoretically guided. Yin (2014) concludes that qualitative research (case studies in particular) can be generalized to theoretical propositions, but not to populations. According to Silverman (2017), the goal much rather is to *"expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization)."* Hence for this particular study, generalization of the findings is of less importance than creating a first qualitative knowledge on one single and narrow focal point, which is the upfront expectation into VE projects (Bryman, 2012), (Silverman, 2017). Gobo (2007) proposes to apply *"interactive, progressive, and iterative sampling"*, in order to achieve representativeness.

5 DATA BASE OF CASES

The author is a trained, certified and practicing value engineer. As industrial consultant, he has participated in a 100+ projects across several industries for different companies over the last decade. The author's experience as consultant in industrial projects has facilitated the access to projects from several diverse industries. The majority of these projects were settled within a particular VE context but yet showed different VE-coverage, -relevance and -density.

These projects' technical content has to obey strict confidentiality. But keeping this research's subjects focused on upfront expectations into the projects only, does not violate any confidentiality restriction. Neither technical project content nor its particular hard goals are being discussed and distributed. Choosing the approach at hands, anonymous information is protected as required, but still can be analyzed and then shared. The large number of projects itself and its diversity with regards of industries, companies, participants and participants' functional roles supports anonymity, do not allow any reference conclusion back on single projects and provides biggest possible and representative diversity within the settled, limited environment.

The author's entire professional project track with more than 100 projects and cases was screened as first step (compare to "Project Data Base with VE Context" in Fig. 3). Applying a first upfront filter on the entire data base resulted in 90 remaining cases as initial data base line fulfilling all of the following characteristics: they were real projects, trainings or conferences; they were no concepts only, nor fragments; they took place during the last 10 years with the author's current work environment and work–scope as VE practitioner; they were embedded within a particular VE context; they potentially can contribute in answering the research question.

5.1 Filtering & Structuring the Project Data Base

As next procedure, a second, more specific filter was applied (compare step "Filter, Selection + Classification" in Fig. 3) on the pre-selected 90 cases. As result, 63 cases remained relevant for the study. 27 cases had to be excluded as not relevant for the study. Reason for exclusion could be any one of the following ones: referring to the research question, they did not contain any stated expectations in VE projects and, hence they could not contribute to answer the research question; they had no clear and specific value engineering reference on second view ("borderline cases") – that could be either one or both of the following cases: they did not have a clear focal point on functional improvement; they did not have a clear focal point on cost improvement; they were of repetitive character, had same or very similar content as other cases and, hence could not add additional contribution; they were of rather conceptual character, as for instance theoretic papers, which had been designed from one single party without reflection or discussion by other different parties; they lacked cross functional cooperation during creation.

Fig. 4 and 5 provide an overview of the cases' base population's classification after applying the first filters.

The vertical axis of Fig. 4 lists the industries, where the projects were nested in. The horizontal axis divides them a twofold way. The primary selection criterion is "relevant for analysis"/"not relevant for analysis" (second line in Fig. 4) for the further analysis as resulted after structuring as described in this chapter above. The secondary criterion (line three) describes the type of each single case. The initial "Project Data Base with VE Context" consists of a total number of 90 cases identified after the first selection, which reduced the original over 100 cases to 90 cases, as shown in Fig. 5.

Those 90 cases were later split into 3 subcategories as a consequence of the emerging differences during the later applied first-cycle

	Total Cases: 90							
	Relevant for Analysis				Not Relevant for Analysis			
	Conference	Project	Training	**TOTAL**	Conference	Project	Training	**TOTAL**
Industries	**7**	**46**	**10**	**63**	**4**	**20**	**3**	**27**
Auto OEM		1		1	1	8		9
Automotive Supplier		1	1	2		2		2
Compressor		11	3	14				
Consulting	1			1			1	1
Farming Vehicles		1		1				
Machinery		6		6		1		1
Marine		1		1				
Oil & Gas		8		8		1	1	2
Rail		1		1		1		1
Safety		5		5				
Semi Conductor		1		1				
Training			5	5			1	1
Valve	6	10	1	17	3	3		6
Bank						1		1
Ceramic						1		1
Mobility						2		2

Fig. 4: Data base characteristics for analysis

coding process throughout the qualitative analysis. For the ease of reading, these later emerged sub-categories are already shown at this point of time as anticipation. They split into 66 projects, 13 trainings and 11 conferences. All of those are assigned to 16 different industries, which are shown on the vertical axis of Fig. 4.

While the category "projects" refers to real practical industrial project work on technical cases, the categories "training" and "conferences" refer to a theoretical, conceptual frame with less interaction and rather one-directional information flow. The category "training" contains cases with theoretical VE education of the participants. The category "conferences" contains cases, where information was shared and discussed with an audience. This information could for instance refer to cutting edge project results, new approaches or lessons learned. In "conference" cases, new theoretical information, which had derived from real practical cases, was spread.

These three categories later showed different response behavior during the course of the analysis of the research question. Summarizing, Fig. 4 and 5 provide an imagination of the cases' diversity, even though they were obtained from one single source only.

Those were screened in a second filter, selected and classified (compare "Filter, Selection + Classification"). A total of 27 cases did not meet the four criterions of the second filter (group "Not relevant for Analysis" in Figure 4, they were "without clearly stated expectations" in Fig. 5). 63 cases remained "Relevant for Analysis" in Fig. 4 (labeled "Relevant Cases" in Fig. 5), with potential contribution to answer the research question. The "Qualitative Analysis with CAQDAS; Coding first Loop" was applied on those 63 cases.

The major share of projects or cases in Fig. 4 was conducted in the closely related industries of "valve", "compressor" and "Oil & Gas". But they were complemented with projects from very distinctive other industries, such as railway, marine, farming vehicles, automotive, semi-conductor and theoretical knowledge from consulting and training expertise.

An even closer look on the project category "projects" (compare waterfall diagram of the 46 "Industrial Projects" in Fig. 5) in a third analysis loop, which also has emerged during

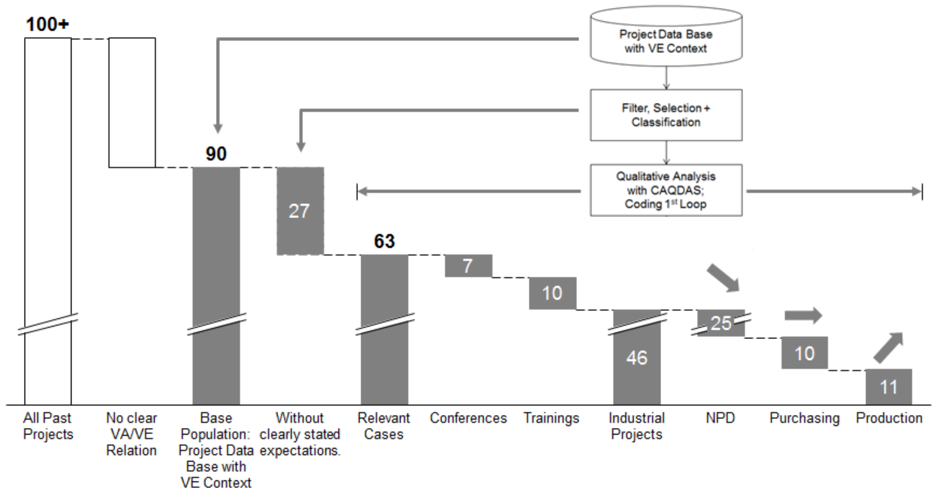

Fig. 5: Cases, their characteristics and timely development

the later second cycle coding process, has uncovered another interesting side effect.

The 46 Industrial projects later were even further split according to their functional environment. More than half of the projects were New Product Development (NPD) projects. Ten projects supported purchasing, mainly for preparation of vendor negotiations in terms of functional- or cost levers. The remaining 11 projects were settled in the production environment for supporting their efficiency at the interface to product improvements, which refer to changes of product functions, -dimensions or -specifications.

The bold dark grey arrows above the right 3 columns in the chart of Fig. 5 indicate the timely and numerous tendencies of projects per category. Despite of best and strongest VE-impact during early new product development projects (NPD) (compare “influence zone” in Fig. 1), the number of NPD projects was decreasing along the timeline. Projects in purchasing environment remained stable, while projects in production surroundings were even increasing along the same time period.

The decrease of NPD projects per time period in the current environment can be explained with the fact of limited number of real new product development projects per year. The higher share of NPD projects is a result of the chosen VE strategy in the current setting. In that the first focal point was set in the optimization of the new products in the development phase. It was then followed by stronger focal point shift to purchasing and production, once VE resources became released, when the NPD project backlog has ceased.

Fig. 4 and 5 proof, that the application of VE is not limited to NPD projects during early product life cycle phases only, but also offers good impact on cases, which – with regards to their development- and product-maturity – have reached already a later and more mature phase of their life cycle, as for instance in purchasing- or production cases.

5.2 Participants

Fig. 6 provides an overview of the recorded project participants including their functional and industrial background. The total number of participants, including the non-recorded ones, exceeds the recorded one. The vertical axis of Fig. 6 provides an overview on the 185 recorded-only participants’ professional role and their occupation. They are aggregated to reasonable main professional role clusters. The horizontal axis of Fig. 6 indicates the industry the projects were nested in. If a participant has participated in more than 1 Project, only the main project

				Recorded Participant Roles - Industry of Cases (Projects)												
			Total Participants	Automotive OEM	Automotive Supplier	Compressor	Consulting	Farming Vehicle	Other Industry	Machinery	Marine	Oil & Gas	Rail	Safety	Semi Conductor	Valve
Professional Role Cluster		Professional Roles	185	3	16	23	14	3	4	5	4	30	34	4	1	44
Consulting	29	Cost Consultant	11				6						5			
		Management Consultan	11				1	3					6		1	
		Purchasing Consultant	7				3						4			
Engineering	54	Engineering	26		2	7						6	2			9
		Methods	7			1						2				4
		R&D	20	1		1				1	3	3	2			9
		Technology Specialist	1									1				
Production	55	Production	19		3	8						2				6
		Purchasing	23		7	3				3		2	2			6
		Quality	7	1	1							1				4
		Supply Chain	6	1								2	1			2
Sales	18	Customer Service	3										3			
		Product Manager	8									1	1	4		2
		Sales	7			1						6				
Generic Function	29	Managing Director	6		1	2						2				1
		Project Manager	9		2		1			1	1	2	1			1
		Value Manager	14				3		4				7			

Fig. 6: Industries of projects and participants' functional roles

(in terms of largest project) was counted (no double count).

The table shows, that the majority of participants are engaged in production- and engineering roles. But they are well spread over different industries and very well represent all functional scopes, specifically contributing to the new product development process in an early stage (compare to the 'influence zone of the "fuzzy front end"', compare to Fig. 1), but equally also during the later phases of product life cycle.

From the data diversity viewpoint, the available data can be considered sufficient for the analysis. The matrix, which is opened by the project sourcing industries and the concerned participants occupation and functional roles, has points with higher density, but generally is well balanced. In return, this research's analysis shall serve as input for the functional roles of the last participant group of "Generic Functions" in similar industrial environments. However, other environments from contrary industries might require a similar approach, which could result in different analysis results.

6 QUALITATIVE CONTENT ANALYSIS

Throughout the course of the analysis different document sets have been formed. The first differentiation was chosen after first and during second cycle coding. The sets have changed based on the emerged findings and according the business environments of the author's current and past occupation environment. Within the current environment a second differentiation was drawn in order to distinguish practical industrial projects from theory-oriented trainings and conferences.

The qualitative content analysis was done with MAXQDA software for facilitating the processing and examination of large numbers of data and documents.

One single and leading question for the examination was defined before the start. This was a simplified version of the research question: "Which were the upfront expectations in the projects?"

Each single case of the entire case population was examined for any comment, which potentially contributes to answer the leading question. Each of these identified information fragments was marked with a code, which itself represented its content. The specific content description was formulated in a memo, which was attached to each code. This procedure was applied case by case. The codes were created inductively, they emerged from the content. Wherever it was appropriate, already existing codes from prior definitions on other information fragments were applied.

37 different codes existed after at the end of the first cycle coding process.

Some of the 37 codes seemed to be very similar, being redundant, or at least aiming into a similar direction. During comparing and contrasting the codes' description was refined and made more precise. Some very similar codes were combined and aggregated into one common code. An accordingly refined code description in the memos was adapted.

Five preliminary Groups of similar or complementing codes then were established, consolidated and defined during this procedure: (1) "Procedural Aspects", (2) "Hidden Participant Agenda", (3) "New Opportunities", (4) "Organizational Aspects", and (5) "Product Related".

In the second cycle coding phase, all text fragments of each single code were cross-compared and contrasted with the MAXQDA software. The subject of examination changed from the cases (in first cycle) to the codes, which were compared from the view of the identified information fragments in the cases. The focal point was set on the applicability of the newly defined groups of codes, the proper qualitative description of the codes for all marked information fragments and the general fit of the code.

Finally, 18 consolidated, different codes emerged from the initial 37 ones. The reduction was carried out by combining similar codes into aggregated ones.

Data was considered saturated, when findings became repetitive and no new idea emerged during the iterative loops (Czarniawska, 2014).

Fig. 7 shows the 18 resulting codes sorted in descending order of their absolute nomination quantity over all cases. 615 information fragments throughout all 63 analyzed documents have been coded in total. "Cost Transparency" is the pre-dominant expectation set in VE projects.

The prior upfront classification of cases (compare Fig. 4) also was re-structured as an emerging side-effect during second cycle coding. The former document groups "projects", "conferences" and "trainings" were re-arranged. "Trainings" and "conferences" both had a rather theoretical character and were merged into "Conferences and Trainings". One case from the preliminary group "projects" moved to "Conferences and Trainings" as well. The remaining "projects" were split according to their industrial environment into "Current Project Environment" and "Former External Environment". This split makes more sense, since differences between these two environments could be detected during second cycle coding, and both are settled within a practical application environment compared to the theoretical group of "conferences and training".

Fig. 8 provides an overview of the code frequency as the percentage of documents, which have been coded with each particular code in the four new document-sets. Multiply applied codes within one document are not considered. The codes are sorted in descending order of their frequency on the set "all documents" in Fig. 8.

The patterns of the frequency barcodes in Fig. 8 obviously varies between the 4 different above-mentioned document sets. These different environments apparently have a different importance in between the codes and a different sequence of upfront expectations. The high contribution share of the document set "current project environment" explains the similarity of the barcode patterns between the two groups

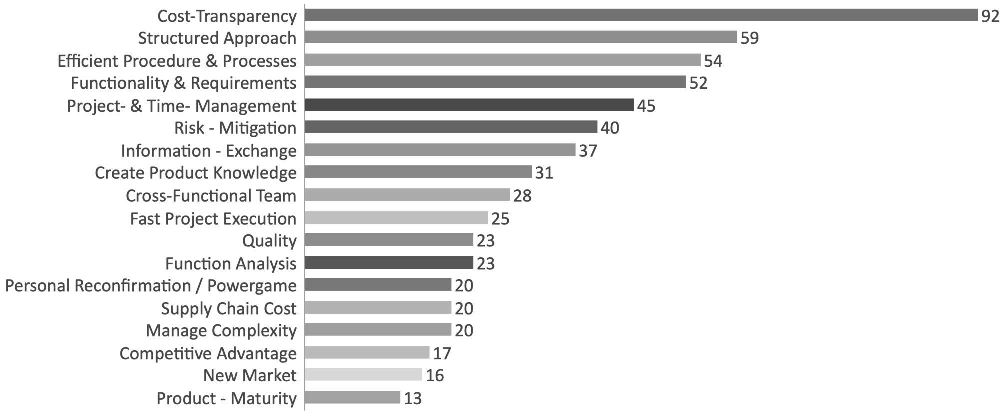

Fig. 7: Codes for expectations with absolute nominated quantity

Codes	ALL Documents (63)	Current Project Environment (38)	Conferences & Trainings (18)	Former External Environments (7)
Cost-Transparency	84,1	97,4	66,7	57,1
Efficient Procedure & Processes	60,3	63,2	55,6	57,1
Functionality & Requirements	52,4	63,2	33,3	42,9
Information - Exchange	50,8	50,0	33,3	100,0
Structured Approach	49,2	44,7	44,4	85,7
Create Product Knowledge	41,3	52,6	16,7	42,9
Fast Project Execution	38,1	63,2	0,0	0,0
Project- & Time- Management	38,1	36,8	50,0	14,3
Personal Reconfirmation / Powergame	31,8	50,0	5,6	0,0
Risk - Mitigation	31,8	34,2	22,2	42,9
New Market	25,4	42,1	0,0	0,0
Competitive Advantage	23,8	29,0	11,1	28,6
Quality	23,8	23,7	16,7	42,9
Cross-Functional Team	22,2	10,5	44,4	28,6
Function Analysis	20,6	13,2	22,2	57,1
Supply Chain Cost	19,1	15,8	16,7	42,9
Product - Maturity	15,9	7,9	27,8	28,6
Manage Complexity	11,1	7,9	5,6	42,9

Fig. 8: Code frequency for expectations – sorted in descending order on all documents

"all documents" and "current project environment".

Interestingly, two gaps between the categories "Current Project Portfolio" and "Conferences & Trainings" become evident, even though the trainings particularly shall prepare and support the application of VE projects in the current environment. The Expectations "Fast Project Execution" and "New Market" are nominated in the current project environment, but were never nominated during any conference and training. See also Fig. 9.

During the second cycle coding process the codes were re-structured and re-grouped with updated and better meaning and fit. The meanings of the new structure of document groups also were taken into account. The 7 new groups have emerged during the second cycle coding and are shown in Tab. 1 and 2. Their emergence was not influenced by any other prior study or theory, their structure and sorting was formed an uninfluenced way through comparing and contrasting. They formed the new fine-tuned thematic focal points of the expectations. In Tab. 1, they are already sorted in descending order on an overall view on all 63 cases. They are (1) "Cost", (2) "Time Management & Efficiency", (3) Organizational Aspects", (4) "Quality-, Risk & Maturity Management", (5) "Function Analysis", (6) "New business Opportunities", and (7) "Hidden Agenda".

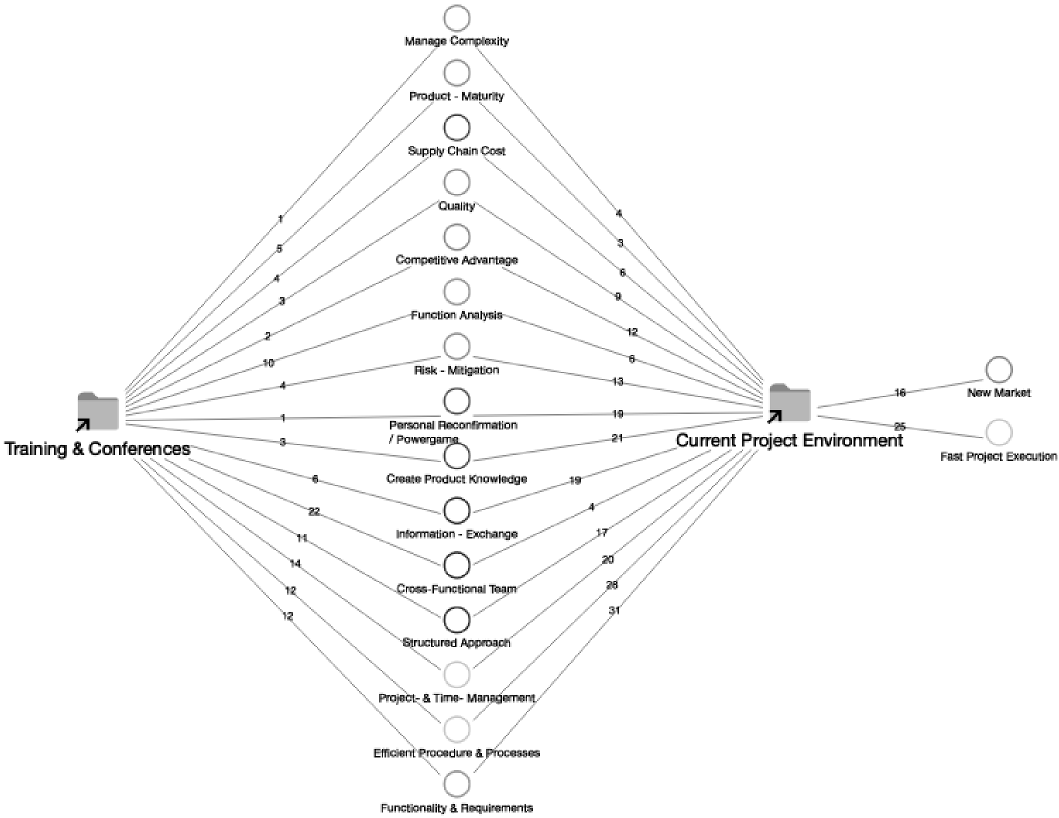

Fig. 9: Two case comparison between trainings and applied projects

7 INTERPRETATION OF SINGLE AND GROUPED EXPECTATIONS

7.1 Single Expectations

In both Fig. 7 and 8 the code "cost transparency" is the most cited code and outweighs all others. Also, in the other 2 documents sets "current project environment" and "conferences and trainings" it is the dominating code, while the emphasis on "information exchange" and "Structured approach" is higher for the former external business environment in a different industry.

A remarkable gap between the theoretically driven "conferences & trainings" and the practical "current project environment" can be found. The codes "fast project execution" and "new market" have a significant role within the practical projects ("current project environment"), while they were not mentioned at all during "trainings and conferences". Fig. 8 and 9 visualize this gap. The two codes on the figure's right end are only mentioned in the document set "current project environment" (quite frequently), while all other codes were cited in both document sets. Future training should take care for this fact. Rethinking the future training focal points towards a more application-tailored content makes sense.

Even though all selected projects were settled in a Value Engineering environment, the specific VE aspect of "function analysis" only is represented at the bottom of the current projects' importance in expectations (compare

Tab. 1: Expectation groups with absolute frequencies

Thematic groups of expectations	**Current project environment (38 cases)**	**Training & conferences (18 cases)**	**Former project environment (7 cases)**	**All cases (63 cases)**
Cost	78	28	37	143
Time Management & Efficiency	73	26	25	124
Organizational Aspects	40	39	45	124
Quality, Risk- & Maturity Management	29	13	54	96
Function Analysis	37	22	16	75
New Business Opportunities	28	2	3	33
Hidden Agenda	19	1	0	20

Fig. 8), while it had a much more dominant role for the projects in the former external project environment.

Surprisingly, in this specific given VE environment, not even one expectation referred into a fundamental VE focal point, namely the customer, and the customer behavior. This is a remarkable gap between theoretic VE from VE-practitioners' view and applied or interpreted VE from participants' or stakeholders' view.

Based on finding these differences between different sets of documents, the author adapted his research strategy from "finding any hint on an expectations into projects" to "identifying commons and differences" between different sets of cases on expectation group level, as explained in the following text.

7.2 Expectation Groups

Tab. 1 shows the newly formed groups of expectations in a descending order on all 63 cases. In an overall view (far right column), cost, time, organizational aspects and quality were the driving expectation groups ahead of VE's core distinctive element, the function analysis. New business opportunities and hidden agendas were least important expectations.

Expectation Group "Cost". The most predominant group of expectations with 143 nominations was basically defined by 3 main thoughts: (1) Create product knowledge by gaining insights and understanding of the product's features, characteristics, functions, advantage for the customer and manufacturability. (2) Create cost transparency on a systematic and detailed level and a feeling for the cost drivers and -levers. Consider influence options on costs and create plausibility. Develop strategies to encounter implausibility or to optimize cost structure. (3) Think in total cost of ownership. Include thoughts on logistics chains, landed cost view, value chain depth, distribution cost and -time, as well tradeoffs as for instance expediting vs. on-time-delivery.

Expectation Group "Time Management & Efficiency". The second most nominated expectation group with 124 nominations is dealing with the time constraint and is defined with the following thoughts: (1) Ensure fast project execution. (2) Consider product creation dimensions: on-time-delivery, throughput time, lead time. Include most efficient and reasonable use of capacities and resources.

Expectation Group "Organizational Aspects". The other second most nominated expectation group with also 124 nominations is dealing with the tactical issues of organizational aspects and is defined with the following thoughts: (1) Apply cross functional setups in order to ensure efficient processes and best possible information exchange. (2) Ensure a structured approach. Consider capacity and competency. (3) Ensure information- and data integrity and data completeness.

Expectation Group "Quality, Risk- & Maturity Management". This expectation group is risk-oriented. It was nominated 96 times and is defined with the following thoughts: (1) Consider complexity in terms of product variants, geography or restrictions. (2) Apply risk mitigation strategies on technology, time,

Tab. 2: Themes of expectations (normalized on number of cases)

Thematic groups of expectations	**Current project environment (38 cases)**	**Training & conferences (18 cases)**	**Former project environment (7 cases)**	**All cases (63 cases)**
Cost	2.05	1.56	5.29	2.27
Time Management & Efficiency	1.92	1.44	3.57	1.97
Organizational Aspects	1.05	2.17	6.43	1.97
Quality. Risk- & Maturity Management	0.76	0.72	7.71	1.52
Function Analysis	0.97	1.22	2.29	1.19
New Business Opportunities	0.74	0.11	0.43	0.52
Hidden Agenda	0.50	0.06	0.00	0.32

quality, finance, procedures, processes and cost. (3) Consider application of maturity-levels with regards to project, product, production processes, vendors, customer acceptance, on time market-release, on-time product-development.

Expectation Group "Function Analysis". This expectation group with 75 nominations is the core of any VE project. Within a given VE-project-environment, it is placed on fifth position in terms of expectation frequency only. It is defined according to VE approach (compare Chapter 3), including function-fulfillment. This includes product functionality, product characteristics and requirements, and product performance improvement.

Expectation Group "New Business Opportunities". This expectation group with 33 nominations is challenge-oriented and defined with the following thoughts: (1) New market: benchmarks, competitive analysis, market requirement definition, customer expectations. (2) Competitive advantage: clear leadership on technology or cost, product performance, impact of optimized product creation processes or supply chain variants.

Expectation Group "Hidden Agenda". The least, but still nominated expectation group with 20 nominations is dealing with mainly interpersonal and emotional issues, such as power games or personal preferences. This could be for instance: (1) Wishful thinking or self-fulfilling prophecies. (2) Reconfirmation of opinions. (3) "Who is better? Who is right?" in terms of negotiations, as technician, as purchasing, manufacturer, process specialist. (4) Defense or acquisition of area of influence.

7.3 Normalized View on the Same Set of Data

Referring to Fig. 8, the huge influence of the largest document group on the overall results became evident. In order to overcome that shortcoming from the viewpoint of comparability between document sets, the author applied a simple form of normalization, as shown in Tab. 2.

The normalization was conducted easily and straight forward by dividing each frequency by cases per set, for instance "cost" on "current project environment": $78/38 = 2.05$. The result expresses the average frequency per case. Considering the different number of cases in the new classification shifts the importance and their emphasis clearly, especially in between the distinctive document sets.

This view results in higher amplitudes on the bandwidth of each document set. "Cost" still is the dominant expectation group in the practical groups, while "organizational aspects" shape the expectations and are of higher concern in the conferences and trainings. This gap indicates a mismatch in content between trainings and practical applications. Future training design should take care for this gap.

With regards to the document set of "former project environment", the amplitudes of the single nodes are much more spread (0.00 to 7.71) than with the other sets (0.06 to 2.17). It is evident, that the group with the largest number of cases is more leveled and shows a band width of 0.50 to 2.05 only. The Question arises, where this effect might derive from? Is this influenced by the higher number of cases, are they "leveled out"? Future studies could consider this idea and analyze accordingly. This question might be a fact to consider for future study-updates.

The first 3 expectation groups in the "former project environment", quality, cost, and organizational aspects outweigh the remaining groups by far. Only the expectation-group "time" stays in reach. The conclusion is, that in that given environment a very strong emphasis was set into these 4 expectation groups in literally every project. That could depend on the personalities of the project participants in that environment.

8 DISCUSSION

The analysis at hands is a first attempt to describe upfront expectations into industrial VE projects. This study's research question was formulated as: "What was past industrial VE projects participants' real upfront comprehensive, contemporary and particular expectation in those projects?"

Answering this research question, this study has elaborated 7 groups of expectations and 18 coded expectations along the course of this qualitative content analysis as outlined in the Chapters 6 and 7. They can serve as a preliminary checklist for future searches of spoken – and more important – unspoken expectations.

All selected projects serve as *"naturally occurring data"* (compare to Miles et al., 2014; Silverman, 2017; Saldana, 2016) for the qualitative part of this analysis. The initial base population consists of 90 projects. They are settled in 16 different industries and ensure richness (Silverman, 2017) and diversity of the data base (Holstein and Gubrium, 2016).

In total, 185 recorded participants from various functional backgrounds have contributed to the single cases. They cover nearly all facets of functional areas and can truly be considered cross-functional. Some of them have contributed to multiple cases. A larger non-replicable number of participants on top were not recorded participants. They were participating on demand and on specific occasions or questions, contributing from their functional point of expertise.

Summarizing, both, data richness and data diversity can be considered sufficient for this research at hand.

VE as a cross-functional approach supports diversity. The diversity of this analysis' input data was granted through the large number of projects, covered industries and the diverse functional and personal backgrounds of all participants. They span over a large array of rich and diverse viewpoints, inputs and interests.

But there is a constraint on the data-set. The projects source is a restricted collection from one source's environment only: the author. Further research and analysis would need to testify this analysis' conclusion on other input data from other environments, sources and industries.

The findings of Fig. 8 and Tab. 1 and 2 demonstrate that projects, which are settled within different industrial environments, might result in different upfront project expectations. Nevertheless, "cost", "time", "quality" and "organizational aspects" are of nearly same importance for either environment.

The findings of this study at hands cover up largely with the findings of Frefer et al. (2018) on general project management critical success factors. Also they see "time" and "cost" on most frequent positions with regards to demanded success factors, and quality on position 4.

The assumption can be drawn, that expectations in projects and their critical success factors are widely the same. On the other hand, the nature of VE projects is mainly project management, as outlined in Chapter 3. Considering that, one should not be surprised by this high degree of cope between the results of those two studies – regardless of the different environments, industries, participants, and their experiences and preferences. The nature of VE projects demands generic project management as fundament. Hence the same critical success factor can be applied, and translated into upfront expectations.

It also became evident, that the expectations and content of training does not cope with real projects' expectations. The identified gaps should be addressed and considered in future training designs. Those gaps specifically referred to the absence of an exact customer definition and explanation of expected customer behavior, but also in the expectation of "fast project execution" and "new markets". While the author sees connection between exact customer definition and new markets, the "need for project speed" remains a necessity, which should be analyzed in future research.

9 CONCLUSION

Summarizing, the author recommends four main further analysis directions and work packages to address this research's findings. First, the training content should expectation-wise be tailored to the practical needs. Second, further investigation would be needed to identify ways to address the expectations in the project speed factor. Exactness and rigor in definition and usage of terminology has to be emphasized. VE projects are mainly projects. But they offer their main distinctive factor: the function analysis, which strongly works with the impact of abstraction and requires a proper and most exact definition of customers and their environment (market). Apply the identified expectation codes, groups of expectations and their detailed description mandatorily in future projects. Refine the descriptions and checklists with any new perspective in continuous improvement loops.

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