WHAT DRIVES EMPLOYEE PERFORMANCE

A look at abilities, motivation and financial performance in an ICT consultancy setting

Master Thesis

Author:
N.Dibo

University:
University of Twente

COLOPHON

Title: What drives employee performance

Subtitle: A look at abilities, motivation and financial performance in an ICT consultancy setting

Publication date: -

Author: N. (Ninib) Dibo

E-mail: n.dibo@student.utwente.nl

University: University of Twente

Faculty: Behavioural, Management and Social sciences

Programme: Business Administration

University supervisors: Dr. Sjoerd van den Heuvel
Prof. Dr. Tanya Bondarouk

University info:
University of Twente
Behavioural, Management and Social sciences
Drienerlolaan 5
7522 NB Enschede
+31 (0)53 489 91 11

Acknowledgements

First off I would like to thank the organisation at which this study was conducted and the people who were involved, for making this thesis possible. I would like to extend my gratitude for being given the opportunity to conduct this research. Both the help with the data gathering, as well as the sparring sessions that helped me to better understand the business environment are much appreciated.

Additionally I would like to thank dr. Sjoerd van den Heuvel and prof. dr. Tanya Bondarouk for giving feedback and helping me to increase the quality of the thesis as well as guiding me through the processes.

Lastly I would like to thank both the people at the methodologiewinkel and dr. Marting Schmettow for helping me with the methodology and statistical analyses.

Abstract

This thesis attempts to find drivers of employee performance in the ICT (information and communication technology) consultancy sector. Its theoretical bases lie with the AMO (abilities, motivation and opportunities) model and the theory surrounding the HR (human resources) causal chain. Based on the AMO model independent variables are chosen and their effect on employee performance is analysed in a sample of 1.577 employees in a Dutch branch of a business unit of an multinational ICT consultancy firm.

Employee performance is chosen as the dependent variable based on the fact that employee performance is a proximal measure, close to the HR system in the HR causal chain. Proximal measures are more desirable as there is less influence from other factors such as is the case with more distal measures including financial measures like return on assets and so forth, where marketing, capital structure and other such factors play a role in the outcome.

The hypotheses concern training, experience, commitment, front line manager performance and individual employee financial performance. All these independent variables are hypothesised to have a positive relationship with employee performance. Additionally the link between front line manager performance and employee performance is hypothesised to be positively moderated by the time a manager spends on management duties (as a manager is both manager and consultant in most of the cases). The link between individual financial performance and employee performance is hypothesised to be negatively moderated by exceptional personal circumstances suffered by an employee. It is expected that managers will pay less mind to or ignore financial performance when an employee is dealing with for instance illness or the loss of a family member.

The sample is split in two groups, all employees and employees that are part of the “financial group”. The reason the sample is split this way, is because not all employees in the sample have individual financial measures as not all employees bill customers directly. Application maintenance employees bill on fixed priced contracts whereas application development employees bill customers directly. The data is gathered over the years 2012, 2013 and 2014 for both the independent and dependent variables. This data is analysed using the linear mixed models approach. The effects of training, experience, commitment and front line management performance will be tested for all employees. The effects of individual financial performance (together with the rest of the independent variables) will only be tested for the “financial group” employees.

For the “all employees group” both training and commitment are significantly positively related to employee performance. Tenure (used as the operationalisation of experience) is significantly negatively related to employee performance. Front line management performance is not significantly related to employee performance.

For the “financial group”, training, commitment, management performance and individual financial performance are significantly and positively related to employee performance. Tenure is still significantly negatively related to employee performance. Neither of the moderating variables seem to have a significant impact on the relationship between their independent variable and employee performance.

The practical implications of these findings are that organisations should continue to invest in training and commitment. The frontline manager performance variable was found to be a crude measure and therefore it is advised to create ways of tracking performance of management specifically designed for front line management duties in order to increase insight herein and possibly create better measures for future research in this relationship. Lastly the tenure statistic shows that organisations should consider entering into contracts with employees, whilst having in mind that this employment relationship should not last till the employee’s retirement (as is already the case in most organisations). Additionally, investing in outplacement and job rotation activities is also encouraged.

TABLE OF CONTENTS

INDEX OF FIGURES

INDEX OF TABLES

LIST OF ABBREVIATIONS

AD	: App development
AIC	: Akaike' s information criterion
AM	: Application maintenance
AMO	: Abilities, motivation and opportunities
BI	: Business intelligence
DF	: Degrees of freedom
DSS	: Decision support systems
HR	: Human resources
IT	: Information technology
KPI	: Key performance indicator
KSA	: Knowledge skills and abilities
ROA	: Return on Assets
ROE	: Return on Equity
ROI	: Return on Investment
RBV	: Resource based view
SCA	: Sustainable competitive advantage
SHRM	: Strategic Human resource management
VP	: Vice president

CH.1 INTRODUCTION

§ 1.1 The subject matter

In the last few years Human resource (HR) departments changed their role from mainly providing reactionary support based on business plans to becoming a strategic business partner (Jackson, Schuler, & Jiang, 2014). This change has been described as a shift from human resource management (HRM) to strategic human resource management (SHRM), where HRM has become an integral part of the business strategy and attempts to positively impact overall business performance (Jackson, Schuler, & Jiang, 2014). The chief way SHRM affects the business performance is through HRM systems that influence employee outcomes, ultimately affecting overall operational and financial performance (Jiang, Lepak, Hu, & Baer, 2012). This Thesis attempts to use previously recorded data in the Dutch branch of a business unit of a multinational ICT (information and communication technology) consultancy firm, to find drivers of employee performance.

HR systems are defined as systems that are targeted towards a certain strategic objective, operating by influencing employees' knowledge, skills and abilities (KSA), as well as employee motivation and effort and lastly, opportunities for employees to contribute (Jiang, et al., 2012; Lepak, Liao, Chung, & Harden, 2006). This is also referred to as "AMO" or abilities, motivation and opportunities.

The most proximal construct to HR systems is "employee outcomes" (Zhang & Morris, 2014; Jiang, Takeuchi, & Lepak, 2013; Jiang, Lepak, Hu, & Baer, 2012). Defined as the output of the HR system, in other words: employee behaviours, attitudes and competencies. Employee outcomes are measured by organisations as employee performance where employee behaviour, attitudes and competencies are judged based on the managers' perception of the employees. Employee outcomes influence operational outcomes (productivity, quality, efficiency, and so forth), which in turn affect financial outcomes (ROA, ROE, ROI, shareholders return, and so forth). This thesis will focus on employee performance as the starting point of this performance chain. Focussing on the most proximal measures will reduce the chances of non-HR-related interference influencing the research outcome. For instance, when using organisational level financial measures such as ROA, ROE or ROI, marketing is likely to influence these financial measures as well.

This thesis attempts to find the impact of employee abilities, motivation and individual financial performance on employee performance. The AMO model has been tested many times before, however, this thesis differentiates itself from previous research in two ways:

First of all, this research is performed in the ICT consultancy sector. The AMO model has not yet been tested here. This multi-billion euro sector, is highly knowledge intensive, constantly changing as a result of its dynamic nature and innovations in ICT that occur in rapid succession such as BI (business intelligence) and DSS (decision support systems) (Dulebohn & Johnson, 2013). The nature of this sector may affect the effect the AMO model has on employee performance.

The second way this thesis distinguishes itself from previous research is the inclusion of individual financial rates to monitor the effectiveness of individual consultants and therefore granting the opportunity to use objective measures to investigate employee performance. Additionally, this study uses a longitudinal design, most HR studies linking HR to performance, have been cross sectional in nature (Wright, Gardner, & Moyniha, 2003). By using a longitudinal study , it is attempted to overcome the inherent limitations of a cross sectional study. This allows for better inferences concerning causality.

Thus the goal of the research is to investigate the AMO model in an ICT consultancy setting using a longitudinal design (as this allows for better inferences concerning causality and there is a lack of longitudinal designed studies in this field), with proximal employee measures (employee performance) instead of more distal operational (quality, service, and so forth) or organisation level financial (ROA, ROE, and so forth) measures. Employee appraisal scores are the dependent variable in this study as those are the operationalisation of employee performance (see chapter three).

Employee ability, in this case human capital (or the skills, education and competencies), is argued to have a positive effect on individual performance and innovation (Winne & Sels, 2010). Motivation, will be evaluated through commitment and management. Commitment is generally measured by organisations in employee surveys, previous literature has argued that commitment is an important factor in improving individual and organisational performance (Agarwala, 2003). Direct line management is taken into account because previous studies have argued that managers affect employee performance. Jackson et al. (2014) even go as far as to state that managers and supervisors always play a central role, regardless of what employee is analysed. Financial performance of employees is measured by the organisation through data of costs and revenue an individual employee produces. Financial performance is a variable that is unique to the setting of this research as it concerns the financial "rates" consultants use. For this thesis specifically, two financial rates are used to operationalise financial performance on an individual employee level, one that indicates the utilization rate and one that shows the revenue/cost rate of a consultant. With these variables, major parts of the AMO model are tested.

This leads to the following research question:

> "What is the effect of employee ability, motivation and financial performance on employee performance in an ICT consultancy setting?"

This question focusses the research towards variables that can be influenced through line managers and HR systems. This excludes variables that are outside the sphere of influence of the organisation such as macro-economic crises or legislation. Line management intervention in this case, is as a way of intervening that is not part of the HR department's responsibility or done through set programmes. These interventions (such as ad hoc talks, coaching, and so forth) are the responsibility of the line managers (they can ask HR for advice) and as such are not part of what the HR department or system directly influence.

§ 1.2 Thesis outline

The next chapters will deal with theory, methodology, results of the data analysis and the conclusions and discussion including the limitations of this research.

Chapter two will focus on the theoretical framework. Starting with the HR causal chain, the position of this thesis within the SHRM to organisational performance linkage literature will be discussed. The next sections will deal with employee abilities, employee motivation (commitment and direct line management) and employee financial performance in terms of how they are linked to employee performance according to previous literature. Every section will provide hypotheses that will be tested in chapter four.

Chapter three discusses the methodology, including the type of the study, the sample, the data gathering, the operationalisation and the data analysis method.

Chapter four will be about the results. In this chapter some descriptive statistics will be shown, the building of the model will be discussed and the statistical analysis will be performed.

Chapter five will be about the interpretation of the findings and directions for future research.

Chapter six will have a discussion on the limitations of this research and will end with practical implications that can be derived from this study.

CH.2 THEORETICAL FRAMEWORK

This chapter will start with a recap on how SHRM influences organisational performance and employee performance in the "HR-system-to-organisational-performance chain".

In the second part, the main independent variables will be described: training, tenure, commitment, direct line management and individual financial performance. This part will also include the hypotheses that will be tested.

§ 2.1 The HR causal chain

One needs an understanding of how organisations try to influence organisational performance through SHRM and how the effect of these attempts are measured. Figure one describes the HR causal chain as a flow chart and visually shows the position of this research within the SHRM literature. This is important for two reasons: first it justifies the choice for employee performance as the dependent variable in this research. Secondly this theory serves as a basis for the hypotheses presented later on in this chapter.

Organisations influence employee behaviour through the HR system. An HR system is defined as geared towards a strategic goal and works by influencing employees' KSA, motivation and opportunities to contribute (Buller & McEvoy, 2012; Jackson, Schuler, & Jiang, 2014; Jiang, et al., 2012; Lepak, Liao, Chung, & Harden, 2006). This has also been described as influencing "abilities, motivation and opportunities" or AMO. The AMO model serves as the basis upon which the hypotheses in §2.2 through §2.4 are built. Through this model, variables that affect employees' AMO are chosen as influencing factors of employee performance.

HR systems are a collection of HR pollicies and practices that serve as means to reach the HR system's strategic goals. Between these practices and policies exist different synergy types such as additive, substitutive or synergistic (Chadwick, 2010; Jiang, Lepak, Hu, & Baer, 2012) affecting (positively or negatively) the overall effectiveness of the HR system. Additive means that the practices operate seperately, meaning that the effect of these practices can just be "added up" (2+2=4). Substitutive means that two or more practices act as substitues for eacother and therefore do not increase the total effect of the HR system when used together (2+2=2) they only increase operational costs. Synergistic means that the total effect of the policies is greater (or smaller based on whether it is positive or negative synergy) than their individual effect (2+2=5).

Not all employee-groups are of equal strategic value or uniqueness as was researched by for instance Lepak & Snell (2002) in a study with 234 respondents showing that different employment modes are used for different employee groups. Nor do all employees have the same relationship with the organisation meaning they need to be managed differently. Employee-groups can also affect each other in different ways as shown in studies such as Davis-Blake, Broschak, & George (2003) with 415 respondents showing that non standard workers may increase turnover and unionization. Malik & Singh (2014) was a theortical study suggesting that high potential programs could negatively affect non-high potential employees. Lastly Way, Lepak, Fay, & Thanker (2010) argued that workforce mixing can negatively impact standard employees in a study using 90 firms. This affects the sample choice as presented in §3.3.

The external environment also influences the effectiveness of the HR system. Legislation, state of the labour market, culture, and other such factors can change the effectiveness or even the composition of an HR system (Farndale & Paauwe, 2007; Fey, Morgulis-Yakushev, Park, & Björkman, 2009; Jackson, Schuler, & Jiang, 2014; Paauwe & Boselie, 2003). This also affects the sample choice as presented in §3.3

Lastly, the strength of the HR system is a concept that also affects the effectiveness of the HR system. This is about the distinctiveness (visibility, relevance, understandability and legitimacy of authority), consistency (validity, instrumentality and consistent HRM messages) and consensus (fairness and agreement among principal HRM decision makers) of the HR system. The employees' perception of these three constructs is what affects the strength of the HRM system (Bowen & Ostroff, 2004). The better the strength of the HRM system, the stronger the effect of the system on employees' AMO. The reason a strong HR system leads to a stronger relationship between the HR system and firm performance is the fact that strong systems are better suited to create a shared common interpretation of the HR policies and practices allowing the organisation to influence the employee behaviour in a consistent and similar way (all employee interpret the HR message the same way and as was intended).

The effectiveness of SHRM has previously been measured with accounting measures such as ROA, ROE or ROI. A study by Delery and Doty (1996) amongst 216 banks is an example of this. Different propositions for SHRM effectiveness measurement also included: productivity, human capital, satisfaction, turnover, absenteeism, behaviour, shareholders return, profits and organisational survival (Becker & Gerhart, 1996; Wright & McMahan, 1992). Even the development of VRIN (valuable, rare, inimitable and non-substitutable) resources and sustainable competitive advantages (SCA) in accordance with the resource based view (RBV) (Barney, 1991) have been argued to be output of SHRM (Boxall, 1996). Measuring this, however, would prove difficult as the RBV is not without its problems. The RBV argues that developing VRIN resources will lead to a SCA, however, it has been criticised many times by for instance Priem and Butler (2001) as well as Kraaijenbrink, Spender and Groen (2010). These critiques show that the RBV becomes a tautology as the definition of both resource and value are unworkably broad and over inclusive.

Jiang et al. (2012) suggest more proximal measures, meaning measures that are more closely related to the HR system. This is where employee outcomes come in. Employee outcomes are the effect an HR system has on employees' AMO (Jackson, Schuler, & Jiang, 2014; Jiang, Takeuchi, & Lepak, 2013; Jiang, Lepak, Hu, & Baer, 2012; Wright P. M., Gardner, Moynihan, & Allen, 2005; Zhang & Morris, 2014). Zhang & Morris (2014), provide a list with measures commonly associated with employee outcomes:

> "Popular measures used in previous researches include the following: employee competence, cooperation with management, cooperation among employees, employee turnover rate/retention, absenteeism/presence, motivation, job satisfaction, commitment and trust in management, job–home spill over (a form of work–life balance), stress levels and perception of work intensification" (Zhang & Morris, 2014) (p. 78)

Thus, employee outcomes are defined as employee behaviours, attitudes and competencies. Employee outcomes are a precursor to operational outcomes (productivity, quality, innovation, service, and so forth). Operational outcomes, in turn, affect financial outcomes (ROA, ROE, ROI, shareholders return, and so forth) (Colakoglu, Lepak, & Hong, 2006; Jiang, et al., 2012; Jiang, Lepak, Hu, & Baer, 2012). To summarize: HR systems attempt to influence employees' AMO, the actual change in employee behaviour, attitudes and competencies are the results of this attempt to influence, these are called employee outcomes. This forms the basis for the choice of using employee performance as a dependent variable in all hypotheses.

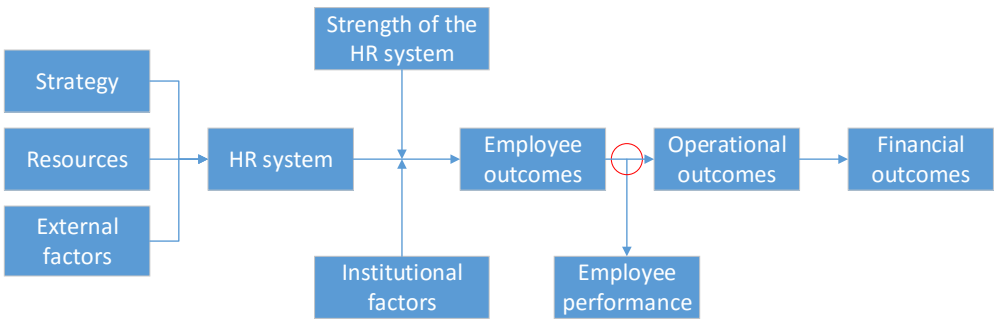

Figure 1: Position of this research within SHRM literature

The organisational strategy (and by extension the HR strategy), available resources (both human and non-human) and external factors (market factors, competition, institutional factors, and so forth) shape the HR system. The organisational strategy is also influenced by the available resources (Barney, 1991) and external factors (Porter, 1979), this is not within the scope of this thesis and will therefore not be discussed any further. The HR system attempts to influence employee-groups' AMO (Jiang, et al., 2012). The effectiveness of this attempt to influence, is moderated by the strength of the HR system (Bowen & Ostroff, 2004) and institutional effects (Paauwe & Boselie, 2003). The outputs of this are the employee behaviours, motivation and competencies (employee outcomes). Employee outcomes then influence operational outcomes and ultimately financial outcomes (Jiang, et al., 2012). Way, Lepak, Fay & Thacker (2010) also note that employee outcomes are antecedents of organizational and financial performance and thus important determinants of firm performance.

As can be seen in figure one this thesis focusses on employee performance as precursor to operational performance and as a direct result of the employee outcomes. The behaviour, motivation and competencies employees possess should reflect in their performance. Employee performance can be defined as the collective employee behaviours that are relevant to the organisational goals and that are under control of employees (Jiang, et al., 2012). The relationship between HR systems, employee outcomes and operational outcomes has been tested by Zhang & Morris (2014) in 168 Chinese firms showing that employee outcomes completely mediate the relationship between high performance work systems (a type of HR system) and organisational outcomes. Similarly, the effects of HR systems on employee outcomes, operational outcomes and financial outcomes was investigated in a meta-study (116 articles representing 120 independent samples including more than 31.000 organisations) showing that these relationships, as proposed by the second half of figure one, exist (Jiang, Lepak, Hu, & Baer, 2012). Summarizing: The independent variables in this study will be based upon the theory surrounding the AMO model discussed in this section. The dependent variable (employee performance) is based on the theory surrounding the HR causal chain, favouring a proximal measure.

§ 2.2 Employee abilities influencing employee performance

As has been previously mentioned, the AMO model is divided into three domains that can be influenced by policies and practices set up by HR professionals (Jackson, Schuler, & Jiang, 2014; Jiang, Lepak, Hu, & Baer, 2012; Lepak, Liao, Chung, & Harden, 2006). The first domain is the KSA domain. This domain is about influencing employees' knowledge skills and abilities to improve them. The rationale behind this is explained by the human capital theory stating that an organisation can invest in the HR system to improve human capital (skills and abilities) to gain economic returns (Jackson, Schuler, & Jiang, 2014). Human capital can be viewed as the composition of employees' KSA (Coff, 2002; Jiang, Lepak, Hu, & Baer, 2012). One such example is a study linking sales training with sales force performance in 202 Spanish organisations where a positive effect of sales training on sales performance was found (Román, Riuz, & Munuera, 2002). The most widely accepted measures of human capital are education and training (Coff, 2002). In other words, human capital is most often measured by looking at the amount of training and education an individual has received. The most common ways to influence the KSA of the employee base is through selection, recruitment and training (Jiang, Lepak, Hu, & Baer, 2012). For the purposes of this thesis, the focus will be on training.

Training should help develop an employee's KSA and should therefore allow for better performance. This leads to the following hypothesis:

H1: Training is positively related to employee performance.

The link between training and performance may prove especially true in ICT consultancy, as the field is dynamic and enjoys many innovations. The need for "maintaining" and updating ones knowledge and skills may prove pivotal to increase ones performance or even "keep up" as ignoring innovation may render an employee incapable to function as older technology becomes increasingly redundant.

Another variable that links employees' KSA and employee performance is experience. Job experience should increase job knowledge and ultimately job performance as employees learn from the situations encountered in the work field (Schmidt, Hunter, & Outerbridge, 1986). This would mean that experience is not a causal factor in and of itself but used as a replacement for the constructs of which data cannot be obtained such as job knowledge (as job knowledge is implicit) (Sturman, 2003). Sturman (2003) states the following about the relationship between experience and performance:

> "Human Capital Theory suggests that employees make investments of experience in themselves, which enhance their ability, and thus influence job performance (Ehrenberg & Smith, 2000). Learning theory also predicts that job experience enhances job ability (Weiss, 1990). Both perspectives suggest that job performance changes over time because individuals accumulate job experience. As job experience leads to the accumulation of relevant knowledge, skills, and abilities, performance should improve. From this basis, models of performance posit that job experience has a positive effect on job performance (e.g., Campbell, 1990; Hunter, 1983b; Schmidt et al., 1986). Providing a detailed treatment of this hypothesis, Schmidt et al. (1986) showed job experience influences job knowledge and task proficiency, which in turn has a positive effect on job performance." (Sturman, 2003) (P. 611)

Sturman (2003) investigated the relationship between job experience and employee performance and found that experience can be a predictor of performance. The type of the relationship depends on the job context. Job complexity is the only investigated variable. In high complexity jobs (such is the case in consulting) the relationship between job experience and performance was found to be non-linear but not an inverted U-shape as generally theorized (Sturman, 2003). An inverted U-shape (or parabola) for experience would mean that experience increases performance greatly at first but that this effect will decrease as more and more experience is gained and eventually the increase in experience will yield no further performance improvements. This was the result of a meta-analysis consisting of 247 studies. The hypotheses derived from this are as follows:

H2: Experience is positively related to employee performance.

As ICT consultancy is for a large part knowledge based, one can assumed that accumulating job knowledge over time will prove to be a positive influence on individual performance. Seniority is often regarded with importance in consultancy as more senior consultants are more expensive and may lead a teams of consultants.

§ 2.3 Employee motivation influencing employee performance

For the purposes of this thesis, commitment and direct line management will be used as operationalisation of motivation which is the second domain of the AMO model. Commitment is described as a manifestation of motivation by Jiang, Lepak, Hu & Baer (2012):

> "…employee motivation refers to the direction, intensity, and duration of employees' effort (Campbell, McCloy, Oppler, & Sager, 1993), as manifested by positive work attitudes (e.g., collective job satisfaction, commitment, perceived organizational support) and work behaviors…" (Jiang, Lepak, Hu, & Baer, 2012) p.1267

Commitment can manifest positively in for instance organisational innovation, as shown by Ceylan (2003) in a study consisting of 103 Turkish firms, or improved individual and organisational performance (Agarwala, 2003). This however seems difficult to prove empirically as for instance Steers (1977) seemed to suggest that commitment was related to intent and desire to stay (or turnover) but largely unrelated to performance in a study comprising of 382 hospital employees and 119 scientists and engineers. An explanation suggested for this is that commitment is only part of motivation in the AMO model and therefore a strong relationship would be difficult to find if there is no control for abilities and opportunities. Becker, Billings, Eveleth & Gilbert (1996) follow up on the issue of commitment being unrelated to employee performance, stating that commitment itself has different foci, as employees can be committed to direct supervisors, top management, customers, co-workers, and so forth. This study found evidence amongst 281 respondents (graduates from the year 1993 from a large north-western university in the united states), suggesting that employee commitment to supervisors is positively related to employee performance. This relationship was also found to be stronger than the relationship between overall organisational commitment and performance. The notion of different types of commitment, having different impacts on employee performance is chief point that was made in this paper.

A different conceptualisation of commitment types was used by Meyer, Stanley, Herscovitch & Topolnytsky (2002) in a meta-analysis consisting of 155 independent samples. This conceptualisation used three types of commitment scales from the "Three-component model of organisational commitment namely: affective, continuance and normative commitment. Affective commitment denoting an emotional attachment or identification with the organisation. Continuance commitment is described as perceived cost of leaving the organisation and normative commitment is defined as the perceived obligation to remain in the organisation.

The findings of this meta-analysis showed that affective and normative commitment were positively correlated with employee performance, whereas continuance commitment correlated negatively with employee performance (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002). The following Hypotheses can be derived from the above mentioned theory:

H3: Commitment is positively related to employee performance.

Direct line management, frontline managers or supervisors play a direct and central roles in the work life of employees (Jackson, Schuler, & Jiang, 2014). For the purposes of this thesis de term frontline managers will be used from here on out. Frontline managers are defined as those managers that directly interact with employees in the operation.

> Jackson, Schuler & Jiang (2014) state that "Regardless of which employee group one is interested in, their managers/supervisors play central roles. In addition to translating stated HRM philosophies and formal HRM policies into daily practices and processes (Hutchinson & Purcell, 2010), their leadership styles and skills may supplant or act as substitutes for the formal HRM system (Chuang et al., in press; Purcell & Hutchinson, 2007)." (P.35)

Managers' leadership styles and skills being able to supplant or act as substitutes for formal HR systems would, in terms of the AMO model, mean that managers are able to directly influence employees' KSA, motivation and opportunities to perform, thus influencing employee performance.

Purcell & Hutchinson (2007) stress the importance of frontline managers' role in the HR causal chain, stating that the perception and experience of people management is crucial in the formation and modification of attitudes towards the employing organisation. This fits into the argument of employees being committed to supervisors as opposed to the organisation alone, improving employee performance (Becker, Billings, Eveleth, & Gilbert, 1996). Purcell & Hutchinson (2007) end with the notion that HR practices and frontline managers have a symbiotic relationship meaning that HR practices need good frontline management to be effective and vice versa.

Much of research on frontline management is about what makes for effective leadership (Graen & Uhl-Bien, 1995). Whether this is transactional or transformation, behavioural (focus on the leader) or empowerment (focus on the follower), relational (focus on the relationship between leader and follower), and so forth. Classifying leadership alone appears difficult. However, the idea that leadership performance and style is linked to employee outcomes, remains. A meta-analysis consisting of 75 studies, for instance, found that transformational leadership was positively related to work unit effectiveness (Lowe, Kroeck, & Sivasubramaniam, 1996).

Leadership and employee performance are also influence by trust. Chen, Eberly, Chiang, Farh and Cheng (2014) found, in a study with "601 supervisor–subordinate dyads of 27 companies in a Taiwanese conglomerate" (Chen, Eberly, Chiang, Farh, & Cheng, 2014)(p.796), that leaders enabling a trusting relationship with their followers can postively affect job performance.

Based on the abovementioned theory the hypothesis can be made that the performance of frontline managers, affects the performance of the operational employees.

H4a: Frontline manager performance is positively related to employee performance.

In ICT consultancy, the front-line manager is the liaison between employee and organisation as well as the face of the organisation, as the employee usually works at a customer location and not within the offices of the organisation itself. Support from within the organisation to the employee thus has to come solely from the front-line manager (not counting colleagues within the same team for a certain assignment). How well the front line manager performs these management tasks and succeeds in supporting the employee from within the organisation should affect the performance of an employee.

The organisation being studied allows front line managers to be both front line managers as well as consultants. Meaning not all managers spend 100 % of their time on management duties, which in turn means that their performance score contains more than their performance as managers. To control for this another hypothesis has been formulated to control for a moderating effect:

H4b: The relationship between front line manger performance and employee performance is positively moderated by the (relative) amount of time a manager spends on management duties, meaning that the more time a manager spends on management duties, the stronger the effect of frontline manager performance on employee performance is.

§ 2.4 Employee financial performance influencing employee performance

For this research, performance appraisal scores will be used as the dependent variable as those should reflect employee performance. However, research on performance appraisal has indicated that performance appraisal scores are not always fully objective and can be dependent on social and situational influences (Judge & Ferris, 1993). Not only the context in which performance appraisals are performed but also the perception of the rater are of importance in the appraisal process (Allen & Rush, 1998). Allen & Rush (1998) performed a field (80 managers rating 148 employees) and a laboratory study (136 students rating videotaped segments of teaching performance) that showed that perceived affective commitment mediated the relationship between organisational citizenship behaviour and overall evaluation. Organisational citizenship behaviour was defined as behaviours that are constructive or cooperative gestures that are not mandatory (not in job descriptions) or directly compensated for (Allen & Rush, 1998; Organ & Ryan, 1995). The mood of the rater in question, whether the rater and rated are similar (in terms of for instance, personality), the relationship between rater and rated, and other such factors all influence the performance appraisal process as found in a literature review of 300 articles (Levy & Williams, 2004). All in all it becomes rather clear that performance appraisal is still a subjective process, even though generally, attempts are made to keep performance appraisal as fair and objective as possible as unfairness would backfire as proposed by a meta-analytic study consisting of 183 organisational justice studies (Colquitt, Conlon, Wesson, Porter, & Yee Ng, 2001).

The context for this study, allows for more objective measures as customers are billed per hour and as such the financial revenue of every individual consultant is known. The costs of an employee per hour are also known since this is connected to the salary administration. The financial performance should be connected to the overall performance.

Financial rates are common in consultancy, there exist many financial ratios that can be used to depict financial performance of employees. For this research specifically, two rates are used namely: ARVE (external billable hours/ (total hours- vacation- maternity leave – works council hours)), which is a utilization rate, and MARK-UP (average earnings of a consultant per hour/ average cost of this consultant per hour based on the employee's external hourly rate and the internal salary costs of that employee) which is a rate depicting whether a consultant is earning or costing the organisation money.

H5a: The financial performance of an employee is positively related to the overall performance of this employee.

The performance appraisal process will be described in chapter three. There may be concerns regarding the fact that financial performance should in theory be part of/ nested in overall performance. However the organisation researched has no systematic/ mathematical way of incorporating financial ratios into the overall performance appraisal scores. The risks of multicollinearity between the two financial ratios is also low as they are computed differently and based on different information sources (This has been controlled for in chapter four).

Exceptional personal circumstances such as sickness or the loss of a family member can impact financial performance of employees as they will not be present at their clients and therefore not bill any hours whilst still being paid by their employer. The expectation, however, is that this will not greatly impact overall performance because managers will keep the personal circumstances of their employees in mind whilst rating them.

H5b: The relationship between Financial performance and employee performance is negatively moderated by exceptional personal circumstances. When an employee deals with exceptional personal circumstances, the relationship between financial performance and employee performance will be weaker.

§ 2.5 Hypothesis model

Adding all hypotheses together gives the following model:

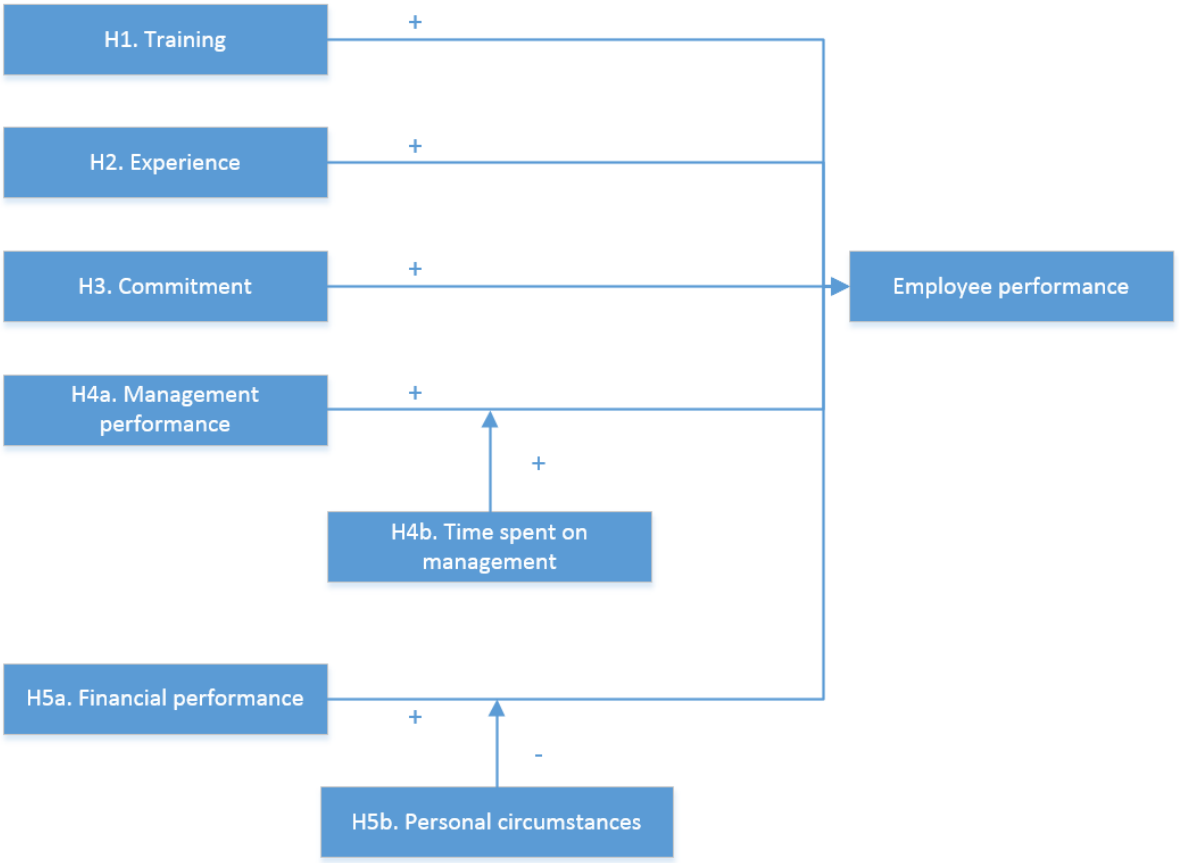

Figure 2: The Hypothesis model of this research

The hypothesised relationships are quite straight forward. The model contains five independent variables and two moderators. The actual data being used is longitudinal in nature, every variable has three years' worth of data associated with it. This will be discussed further in chapter three.

CH.3 RESEARCH DESIGN

§ 3.1 Type of study

This study is a longitudinal quantitative study performed within a single organisation. The organisation in question is a consultancy firm specialised in information technology. The study takes place within a Dutch branch of a business unit of this firm.

The reason for using a single business unit lies in the fact that the assignments (and thus the competencies and work behaviours necessary), vary across different business units. Choosing a single business unit limits the chances that these variations influence the outcome of the study. Even within the business unit that has been selected to study, there are a large amount of different branches within the private sector in which the employees are active, meaning different branch specific knowledge is required of employees also. Additionally there are employees active in the public sector as well as in outsourcing jobs. Choosing a single business unit reduces the complexity in this particular situation.

Using only a Dutch business unit reduces the chances that legislation will have an effect on the outcome of this study. Contracts between the organisation and the clients, as well as labour laws (working hours, vacation time, and so forth) and other such important factors, can differ per country. This could affect how managers rate their employees as the environment in which an employee operates differs and thus what is expected of the employee may differ as well.

§ 3.2 The organisation and business unit

As described earlier, the organisation at which the research is performed is active in the ICT consultancy sector. It is active in both North & South America, Europe and Asia. The main activities include consultancy and outsourcing. The organisation is split into seven strategic business units. These Strategic business units are then once again split in geographical branches. This research is performed at a Dutch branch of a single strategic business unit.

This Dutch branch holds about 2.500 employees and primarily focusses on three types of services:

1. Application development (AD)
2. Application maintenance (AM)
3. Academy

AD is split into public and private, meaning AD projects are performed for both (semi-)governmental organisations and private/ commercial organisations. The tasks of AD include consultancy services for the implementation of ICT services, software as a service, business process management, and so forth. The employees that work here include software analysts, information system analysts/designers, software engineers, business analysts and so forth. If the entirety of AD would be reduced to a single sentence, it would be: " Realizing software to support customer (business) processes/ services."

AM is tasked with outsourcing activities, the employees that work here focus on the maintenance of customer systems. The main goal is making sure the customer systems run as expected and are kept in working order as cost efficiently as possible. Most employees employed by AM do not bill hours directly to customers as the AD employees do, but instead work on fixed priced contracts.

The academy is a very small part of the Dutch branch and is focussed on training activities for both external and internal customers. The employees here are mainly concerned with providing training sessions.

§ 3.3 Sample

As described previously, the sample has been selected from a Dutch branch of a single business unit. The organisation uses a system by which a "level of professionalism" is awarded to employees, called: "Grade". This allows for growth within the function without having to grow vertically in the organisation. Each level has increasingly demanding criteria associated with it. These criteria are specific to the profile of a grade and concern competencies of employees such as people orientation (is about team work and the way the consultant treats others), delivery (about adhering to procedures, delivering the product on time, and so forth) and so forth. The amount of levels is six, ranging from trainee to vice president (VP). The units in question are consultants, meaning supporting staff is excluded. The level of VP is filtered out because the criteria associated with this level and their role in the organisation differ significantly from the other levels. Meaning their performance appraisal scores are no longer comparable to other employees within the organisation. The data will be gathered over the past three years, as such only employees that have been employed over the past three years are included in the analysis. This can include employees that have been employed for longer, given that they are still employed at this point in time. This also means that any specific effect of people who left or entered the organisation within the test period will not be taken into account. All in all this sample will consist of 1.577 employees, 589, 599 and 602 of which were employed for outsourcing and maintenance of customer systems (AM) in the years 2012, 2013 and 2014 respectively. 988, 978 and 975 employees were active in the public and/or private sectors for consultancy services concerning the implementation and development of IT systems (AD) in the years 2012, 2013 and 2014 respectively. This distinction is relevant for hypotheses 5A&B as will be explain in §3.4.

§ 3.4 Data gathering

As stated before, the data used in this study has been directly gathered from all relevant HR and financial systems. The data was gathered in as "raw" a form as possible, allowing for data transformation if necessary. The data concerning employee performance has been gathered from the appraisal matrixes used by managers to rate the performance of employees. The data concerning basic employee information such as function, level of professionalism, department, tenure and other such data, can be gathered from the HR systems in place. More complex data like the financial performance of an employee is based on the amount of hours an employee has spent with (and billed) a customer instead of internal projects. This is however not a suitable measure for employees that are employed for outsourcing projects as these are completely billed on fixed price contracts. Therefore AM employees will be excluded from the model for the financial hypotheses. As there are 988, 978 and 975 (in 2012, 2013 and 2014) employees in AD, this should not be a problem (sample size wise) for statistical testing. For a table with the operationalisation and explanation of all used variables, please see appendix A. All data is collected over the years 2012, 2013 and 2014

§ 3.5 Data analysis

The linear mixed modelling method will be used to analyse the data. H1 up until H4B on training, tenure, commitment and management performance will be tested for all employees. The Hypotheses 5A and 5B on financial performance will only be tested for the relevant group (AD) as those in AM do not do any work directly billable to customers but instead work on fixed price contracts. This means all hypotheses will be tested in a separate model for the "financial group" (AD) The model building and testing of statistical assumptions will be done in chapter four

§ 3.6 operationalisation

In this section all variables in the model (both dependent and independent) are described. First it is described what construct the variable represents, then how the variable is measured and to what hypothesis the variable belongs. Appendix A presents various tables in which summaries of all variables are given. All data has been gathered over three years, namely: 2012, 2013 and 2014.

§ 3.6.1 Employee performance

Employee performance is measured using the employee performance appraisal scores. The appraisal scores serve as means for rating employees within an the organisation. An entire reward system is tied to the appraisal process which includes bonuses as well as promotion opportunities.

The employee performance score is the result of an annual performance appraisal process. The performance appraisal process spans the entire year, starting with the quarter one objective setting. In this phase, the employee and manager set objectives together based on key performance indicators (KPI), result objectives and development objectives. These objectives are recorded in a career development system. Throughout the year a manager will give general feedback on the performance of an employee on the request of the employee himself or whenever the situation demands it, colleagues can also provide feedback. Employees also receive an assignment appraisal based on customer input, which can come via the customer directly, via a project manager, colleague or via an account manager. The assignment appraisal is an important part of the overall appraisal score. At the end of every quarter the employee in question reports on the progress of his or her performance KPIs using a general feedback function in the career development system. There is also an opportunity to do a midyear self-assessment in June and July, in which the employee reports his progress on all objectives in the career development system after which the manager of this employee will respond with feedback on this self-assessment. This, however is not commonly done in the branch in which this research takes place. The entire appraisal process ends with the employee performing an end-year self-assessment, giving an opinion on his or her own performance throughout the year. After which the annual review is performed by a group of managers. Based on all the input in the career development system, the conversations held and the objectives that may or may not have been met the manager gives his or her judgement on what performance score is appropriate for an employee. This is then taken as input in the calibration session in which a group of managers judge the employee's performance and give the employee a final rating . This is then reported to the employee. The scores that can be given, range from one to five where one is the highest score and five is the lowest (see appendix A for a description of the meaning of the scores).

In case an individual scores a five or a four, a personal improvement plan will be created to improve their performance. This performance appraisal method is fitting for the definition of employee performance given in §2.1 as it measures the contribution of an employee to the organisational goals and uses a standard (the expectations in a certain grade/ role) as an orientation point to award above and below average scores. For the purposes of the analysis, the performance scores have been coded in reverse (meaning 1 is the worst score whereas five is the best score).

Employee performances plays a part in all hypotheses as it is the dependent variable of the model. The scores are assumed to be interval level. Assumed here means that it will be treated as an interval variable even though it strictly is an ordinal variable this is done for the purposes of being able to perform statistical analyses (see chapter six for a discussion on the how this may affect the results of the analysis).

§ 3.6.2 Training

The variable representing training is the amount of training completed per year, during the test period. The training variable is based on information from a training related computer system and contains all trainings an employee has registered for and completed, during the test period (three years). The data from before the test period is unavailable. The data is transformed to give the amount of training an employee completed during a year, this is a ratio variable. This variable belongs to H1 the expectation being that the more training an individual has completed, the better the performance of that individual.

§ 3.6.3 Experience

Tenure serves as the variable that represents experience. Tenure is computed by taking the date an employee entered the company and then comparing it to the last day of 2012. This gives the tenure variable in amount of years, for instance 10.3 years. Important to keep in mind is the fact that tenure is computed using the **last** day of 2012 rather than the first. As the performance appraisal score is based on that entire years performance, this seems the most appropriate, however it could still introduce a small bias. The last bit of experience at the end of the year possibly has less influence on the performance appraisal score than the experience an employee has at the beginning of a year or halfway through a year. The rest of the years are computed by taking the tenure in 2012 and adding one to it in each year (2013= tenure 2012+1, 2014=tenure 2012+2). Tenure is a ratio variable taken from the personnel records and belongs to the second hypothesis of this study.

§ 3.6.4 Commitment

Commitment is operationalised by using the commitment scores found in the results of the global employee survey (GES). Commitment scores are based on the amount of positive responses given to certain questions in the global employee survey. The GES deals with many different topics, employee commitment being one of them. Most statements are scored on a scale of one to five where one is low and five is high. Four and Five indicate a positive response, three is a neutral response and one and two are negative responses (see appendix A for the commitment questions). The commitment score is computed by taking the amount of positive responses and dividing these by the total answers. If an employee answered 75% of the questions positively (4 or 5) and 25% neutral or negatively (3 or lower), that employee will have a commitment score of 75. The questions concerning how long an employee plans to continue his or her career with the company or whether they have tried to find another job are not used to compute the commitment score. Because of privacy related reasons, it is impossible to obtain the scores on an individual level, meaning that the scores in the dataset are aggregated to either, sector, division, division and grade or sector and grade level. Whether a use of a certain level is possible, depends on the amount of people in that level. For instance all employees that are part of division X in the year 2013 and are in grade two (consultant) have commitment score Y, or all employees that are in division X in the year 2013 and are in grade three (senior consultant) have commitment score Z. Because of the same privacy concerns, it is impossible to see who did or did not fill in the survey. The way in which the employees were assigned a score is as follows: First the dataset is filtered to as small a group as possible by selecting one division and a single grade within that division. Then the GES data is checked to see if the commitment scores are available for that division and that grade. If that is the case then that entire group of employees will get the average score of that grade in that division. This means that every employee in that group will have the same commitment score. If the data is not available on grade level it means there are too few employees in that grade (under ten) and therefore the grade score cannot be displayed due to privacy reasons. This group of employees is assigned the division commitment score. If the division itself is too small to receive a separate score the employee group that belongs to that division will get their scores based on the sector they are part of and the grade they are part of. This is rarely the case and when it happens it concerns no more than four employees at a time in the entire sample. The commitment reports of 2012 do not have a demographic breakdown so it is impossible to filter on grades in the year 2012. This means that for the commitment scores of 2012 either the division or sector score is used.
Commitment scores are used for the third hypothesis and are ratio variables.

§ 3.6.5 Frontline manager performance

Just as with employee performance, the frontline manager performance is operationalised using the performance appraisal scores of front line managers. Frontline managers act as a liaison between the organisation and the employees. Employees wanting to do certain types of training (for instance concerning technical skills, soft skills or legal issues), having problems with an assignment or illness, and so forth, report this to their frontline manager. The frontline manager is also responsible for coaching an employee and helping that employee to reach their KPI goals set at the start of the year, give feedback and supporting the employee when necessary. The management performance score is comparable to the employee performance score as managers are in most cases both manager and consultant (see §3.5.6). The performance score of a manager thus has both elements from his or her work as a consultant and a manager. The consultant part is the same as for a regular employee. The manager part is different. First of all the KPI objective setting at the beginning of the year may or may not include objectives for management duties (this is impossible to check for in the data). Secondly the amount of " sales" a frontline manager generates are part of his or her performance score. Frontline managers are expected to find and obtain contracts for the organisation. The GES is also used in the performance appraisal of a manager as the commitment scores of the division a manager is part of as well as different parts of the GES such as the manager effectiveness profile. This manager effectiveness profile has statements (scored from one to five) such as: "My manager treats me with respect" , "I trust my manager" and " My manager is an effective leader". Additionally certain organisation based HR objectives are also part of the performance score of a manager. First of all it is a managers responsibility to retain high performing employees and either help increase the performance of employees that are not performing well or create wanted attrition. The frontline manager is also responsible for pyramid management. Meaning that there needs to be a certain amount of trainees, consultants, senior consultants, and so forth. This is to assure that there is at least some seniority within a division set group of employees and to make sure there are enough new employees to take the place of those who are leaving the organisation. This variable is also assumed to be of interval level and belongs to hypothesis 4 A&B.

§ 3.6.6 Time spent on management duties

The moderator "time spent on management duties" is operationalised by computing the percentage of time a manager spent on management duties during a year. Frontline managers can be both managers as well as consultants, therefore this variable is used as a moderator to control for this. The time spent on management duties is difficult to assess with 100% certainty. The following method has been used. Data from the financial system is used to produce an overview of the hours a manager has booked on certain codes that either signify direct (customer based) hours or indirect (all other) hours. From those indirect hours, all activities but management activities that have to do with managing employees, are filtered out. Then these hours are compared to the total amount of hours a manager has registered as working hours to calculate the percentage depicting the amount of hours spent on managing people in relation to total time spent working. This variable is specifically used for H4b as it is a moderator in the model. As this variable is computed as a percentage, it is a ratio variable.

§ 3.6.7 Financial performance and exceptional personal circumstances

Financial performance is operationalized using two different financial rations, namely: ARVE and Mark-up. Exceptional personal circumstances serves as a moderator and is operationalised using dummy variables that divide the group into three categories: N/A, partly or mostly.

ARVE is a ratio that is computed based on the financial billing data of an employee. It takes into account the amount of hours an employee works in total (based on his or her contract) and uses the amount of hours an employee has billed to a customer to give a ratio from 1-100% to denote the utilization of a consultant. A consultant with an ARVE of 100% would have spent all his time working on projects that have been billed to customers.

ARVE is computed using the following formula:
External billable hours/ (total hours- vacation- maternity leave- works council hours)

As can be seen, vacation, maternity leave and works council hours have been excluded from the total hours so those will not affect ARVE. This does mean however that illness will affect ARVE. A consultant has spent time away from the customer for health reasons will therefore have a lower ARVE than if he or she had not.

Mark-up is a ratio that is computed based on the average earnings of an employee (for the organisation) and the average hourly costs of that employee. The average earnings are based on the rate at which a consultant performs his or her service, (for instance €200.- per hour), the amount of time a consultant has worked for a certain rate and the amount of hours a consultant is paid for in total. For instance a consultant that has work for €200.- for 1040 hours and €250.- for 1040 hours will have average earnings of €225.- The average costs of a consultant are based on direct salary and benefit costs per hour in a year.

The exceptional personal circumstances are divided in three categories: not applicable, partly or mostly. Not applicable means that there were no exceptional personal circumstances for a certain employee in a certain year. Partly means that there were exceptional personal circumstances that partly influenced the results of an employee. Mostly means that there were exceptional personal circumstances that had a large impact on the functioning of an employee in that year.

Whether a partly or mostly score is give, depends on management judgement, there is no systematic or mathematical way of assigning this score. The manager records a partly or mostly score in the financial calibration overview if it is the case.

ARVE and Mark-up belong to both H5A&B and are ratio variables. Exceptional personal circumstances belongs to H5B and is an ordinal level variable. As such, it is transformed into dummy variables in order to allow for statistical analyses.

CH.4 ANALYSIS

§ 4.1 Descriptive statistics

Appendix B presents descriptive statistics per year for different groups of employees based on the hypotheses presented in chapter two. The first table for every year shows descriptive statistics for all employees included in the research, excluding the financial variables. The second table of every year shows the frequencies for the exceptional personal circumstances for the group that is part of the financial analysis, having the categories: not applicable , partly or mostly. The third table of every year shows all variables including the financial variables (ARVE and MARK-UP) for the group of employees part of the financial analysis. The last two tables of every year show the frequencies of grades in the "all employees" and "financial groups" respectively.

As discussed earlier the reason the sample base is split up in all employees and employees for the financial analysis (AD employees), is because the AM employees do not work directly with customers but on fixed priced contracts. As such the ARVE and MARK-UP rates cannot accurately reflect financial performance.

Starting with the first table of every year (Table 9, Table 14, Table 19), This table contains all variables necessary for testing the first four hypotheses that will be tested for the entire sample. Employee performance is the first variable in the tables. Here it can be seen that generally the employee performance's mean is around 3 and the standard deviation is around .7 for all years, fluctuating slightly. By examining the skewedness and kurtosis statistics we can assume that these scores are normally distributed and skewed to the right in all years. There are some missing values concerning the performance in 2014, this has to do with the fact that the performance for these employees had not been updated yet as of the moment of data gathering. The mean amount of training completed tends to fluctuate strongly, starting at approximately four, decreasing to 3.3 and then increasing strongly to 7.9. In all cases it can be seen that the distribution is strongly skewed to the right and cannot be considered normal. This is underlined by the kurtosis statistic showing high scores (up till 30 in year two). Additionally the standard deviation is large in all years.

Tenure's mean increases by one year, per year. Tenure is also normally distributed whilst being somewhat skewed to the right. The skewedness to the right is to be expected as the minimum possible time with the organisation is one (end of the first period) whilst the maximum has no artificially imposed limit. The commitment scores seem to be around 47 (meaning 47% of the answers given to the commitment questions were answered positively) each year, also being normally distributed. Interestingly, the commitment score is skewed to the left in 2012 whilst it is skewed to the right in 2013 and 2014. This may have something to do with events in 2012 leading to a large amount of employees being fired from the organisation as part of a reorganisation. The mean grade increases slightly over the years, hovering around 2.1, being normally distributed and skewed to the left. The skewedness is to be expected as a larger amount of individuals are in lower grades as opposed to higher grades as those in higher grades are required to have larger amounts of experience and have to prove themselves to be more capable individuals (accomplishments, fitting the profile, and so forth). As can be seen in the table, there are no people in grade 0 (trainee or assistant consultant) past 2012 as the expected time in that grade is around one year. Because the sample does not take any new hires into account (during the test period) this grade is completely eliminated from the sample by 2013. The fourth table of every year (*Table 12*, *Table 17*, Table 22) shows the frequencies for the grades. As can be seen the bulk of consultants falls in the senior consultant category (45-48% from 2012 to 2014). After 2012 it can be seen that there are no more trainees.

Time spent on management duties and manager performance are both generally within the bounds of being normally distributed according to the kurtosis and skewedness statistic (except manager performance 2012 where the kurtosis is -1.009 and time spent on management duties in 2013 where the kurtosis is -1.179). unlike employee performance, management performance appears to be skewed to the left whilst the mean is only slightly higher (around .2 in every year). Additionally, important to note is the missing values, for both management performance and time spent on management duties. It seems there are some managers for which the performance has not been recorded, this can have multiple causes. Firstly, it is possible the manager left the organisation before he or she completed the appraisal process for that year. Secondly it is possible that the manger is a VP, meaning the appraisal process is different. Lastly it is possible that the performance scores were simply not registered in a way that allows for data acquisition within the systems the data was drawn from.

Time spent on management duties displays an interesting development as by 2014, there are no more missing values. The way the financial booking codes are set up seem to have brought about this change. This is also reflected in the minimum and maximum statistic columns as the minimum time spent on management duties increases from one percent to 11 percent. The way this statistic develops through the years and the information in the raw underlying data, seems to suggest that the information reliability increases throughout the years. The mean for time spent on management duties is around 61% (65% in 2013).

A last important remark has to be made concerning the nature of the manager statistics. Both the manager performance and time spent on management duties variables **do not** show the distribution, mean scores and so forth, amongst managers. The statistics show how the manager performance and time spent on management duties are distributed amongst the employees. The N reflects this as there are, for instance, 1505 observations of manager performance scores in the year 2014 whereas there are not that many managers.

The second table of every year (Table 10, Table 15, Table 20) depict the frequency of the exceptional personal circumstances variable. The reason this variable is displayed in frequencies instead of simple descriptive statistics is because it makes more sense to see the amount of times such an occasion occurred rather than the mean amount of times a situation occurred. This table has only been made for the employees that are part of AD as this variable is part of the financial performance hypothesis as a moderator (H5B). It can be seen that, throughout the years, around 90% of employees do not fall into categories "partly" or "mostly" , meaning they had no exceptional personal circumstances to deal with. Around 6 to 7% of cases deal with exceptional personal circumstances that are "partly" responsible for that year's performance and around 3 to 4% of cases fall in the last category where the personal circumstances dominated the performance of an employee in a certain year.

The third table of each year (Table 11, Table 16, Table 21) display the descriptive statistics for the " financial group" as the analysis on all variables including financial variables will be ran again for this group, separately. Performance, training, tenure and grade are all comparable to the group that includes all employees, both in the values and how they behave. Commitment, does have a difference in 2012, as this commitment score mean is much higher than that of the complete sample. The explanation for this could be that AD lost fewer jobs than AM during the reorganisation in 2012. The skewedness of commitment, however, does show the same trend (to the left in 2012 and to the right in 2013 and 2014). Time spent on manager duties seems to fluctuate as the mean is 65%, 58% and 74% in 2012, 2013 and 2014 respectively. The skewedness (to the left) is within bounds in all years (although it 2012 shows a skewedness that nears -1). The kurtosis is smaller than -1 in 2013 and 2014, meaning that normality cannot be assumed in these years. Manager performance mean scores are around 3.5 in all years, the skewedness fluctuates greatly (.253, -.220 and .092 in 2012, 2013 and 2014 respectively) the skewedness is however within the bounds of normality. The kurtosis statistic shows that the manager performance scores in 2013 and 2014 can be considered normally distributed (in combination with the skewedness statistic) but the kurtosis in 2012 is too small (-1.188). Therefore, it can be said that the manager performance scores in 2012 are not normally distributed.

The last two variables for this group are the financial variables ARVE and MARK-UP. ARVE shows a mean that increases in 2013 (from .7074 to .7784) and then stays around that level in 2014 (.77). The standard deviation is above .23 in all years and increases each year. This is a rather large standard deviation as this would mean that one single standard deviation from the mean increases (or decreases) the utilisation rate of a consultant by at least 20%. In case of an increase this would mean that a consultant in 2012 with +1 on the standard deviation has a utilisation rate of over 90%. The kurtosis and skewedness statistic also show that ARVE is not normally distributed.

MARK-UP shows a similar picture, with a slightly fluctuating mean across the years, a large standard deviation and a non-normal distribution.

Lastly, the fifth table of each year (Table 13, Table 18, Table 23) displays the grade frequencies for the " financial group". As can be seen, the financial group has fewer consultants and more managing and principal consultants (relatively). The senior consultant group is still the largest.

§ 4.2 Building the models, testing the assumptions and testing the hypotheses

In order to get the best possible data-model fit, the models are built variable by variable after which the assumptions for the models are tested. In this section, the hypotheses will be tested however, the interpretation of the results will take place in chapter five.

§ 4.2.1 Building the "all employees" model

In appendix C the model dimensions, assumptions and information criteria are displayed. The analysis is ran separately for every variable that is added as either a fixed or random slope. By looking at the model parameters and information criteria, it is possible to figure out which model fits best with the data. The more parameters, the more complex the model is, the smaller the information criteria, the better the model fits the data. The information criterion used for this analysis is AIC (Akaike' s information criterion) because it corrects for sample size.

In the analysis the employees are specified as subjects and the time variable is repeated (this variable indicates whether an observation took place in 2012, 2013 or 2014) and the covariance matrix specified for the repeated measures is diagonal (indicating that variances amongst repeated measures are independent). The model is ran using the maximum likelihood method of estimation allowing for efficient estimation of both balanced and unbalanced data. Starting with the intercept, using a model with a fixed intercept yields a model with four parameters and an AIC of 9883.397. Remodelling this model using a random intercept creates a model with five parameters and an AIC of 8625.879. Using a Chi-square distribution with a chi-square score of 1257.518 (largest AIC score minus the smallest AIC score) and 1 (largest number of model parameters minus smallest number of model parameter) DF (degrees of freedom), we can conclude that the model with a random intercept is significantly better than the model with a fixed intercept ($p<0.00001$). Next, training will be added as a fixed slope into the model, this yields a model with six parameters and a AIC of 8607.109. Using Training as a random slope, the software returns an error indicating redundant parameters, thus training will not be added as a random slope. The error concerning redundant parameters means that adding a variable as having a random slope makes the model overly complex (too many parameters) whilst it does not improve the model/ makes the data fit the model better. Adding tenure to the model as a fixed slope creates a model with 7 parameters and an AIC of 8250.445, whilst adding a random slope for the slope of tenure using an unstructured covariance structure (indicating that covariance is random between subjects for the slope) yields a model with 9 parameters and an AIC of 8215.254. This significantly improves the model ($p<0.00001$).

The third variable added to the model is commitment, as a fixed slope (model parameters: 10, AIC: 8177.470) and then as a random slope (mode parameters: 13 AIC: 8178.959). As the AIC for a fixed slope is smaller than that of the random slope and the random slope model requires more model parameters and is therefore more complex, there is no reason to use commitment as a random slope variable because it complicates the model without improving it.

Manager performance and the interaction effect for manager performance (amount of time spent on management duties), are the last two variables to be added to the model that is created for all employees. Starting with manager performance, a model with 11 parameters and an AIC of 7624.670 is created. Adding manager performance as a random slope variable yields a software error meaning the extra parameters are redundant. Introducing the interaction variable into the model returns a model with 12 parameters and an AIC of 7447.629. Adding the interaction effect as a random slope variable returns an error meaning the extra parameters are redundant.

The most optimal model thus has: a random intercept that fluctuates amongst employees, fixed slopes for every variable except tenure (which has a random slope with an uncorrelated covariance structure) and 12 parameters.

§ 4.2.2 Checking the assumptions for the " all employees" model

The assumptions for linear mixed models are mostly the same as for multiple regression analyses. Starting with the variable types, the variables are all continuous variables. Employee performance and manager performance are treated as continuous variables (see chapter six). The second assumption of non-zero variance is also met as the data clearly has variance in both dependent and independent variables. In appendix C a correlation matrix is added for this model to test for perfect multi-collinearity. There does not seem to be any perfect or large collinearity between two predictors, meaning that this assumption is fulfilled. Generally there would be a VIF statistic option to test for multi-collinearity , however there is no such option for linear mixed models. By looking at the correlation matrix we can see that no predictors correlate with each other with correlation values above .11 so it is extremely unlikely that multi-collinearity is a problem. The next assumption concerns homoscedasticity of the model. This assumption is extremely hard to confirm due to the nature of the data as the outcome variable is only measured in "whole numbers". The scatterplot in appendix C suggests that we can interpret this as homoscedastic, although the residuals at both the low and high end show a somewhat different distribution to those in the middle. This is most likely cause by the low amount of observations of performance scores that deviate far from three as three is the norm. Log transforming the data and rerunning the analysis to create new residuals returns an error message in the software and does not change the shape of the scatterplot favourably. The linearity assumption for this model cannot be fulfilled as it is known that tenure and performance do not share a linear relationship, this has implications for the model (see chapter 6). The assumption that the errors have to be normally distributed with a mean of 0 can be fulfilled (see histogram and descriptive statistics table in appendix C). In summary, most assumptions can be fulfilled. The assumption of linearity cannot be fulfilled in the case of tenure and the assumption of homoscedasticity seems to be fulfilled. An assumption usually associated with regression is the assumption of independence, meaning all observations are independent of one another, this assumption does not need to be fulfilled when using linear mixed modelling, we assume that the variables within our subjects are related.

§ 4.2.3 Hypothesis testing of the "all employees" model

Estimates of Fixed Effects[a]

Parameter	Estimate	Std. Error	df	T	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	3.240478	.073808	4102.957	43.904	.000	3.095775	3.385181
TRAINING	.002315	.001067	2845.159	2.170	.030	.000223	.004406
TENURE	-.026404	.001384	719.515	-19.081	.000	-.029121	-.023688
COMMITMENT	.004460	.000834	3986.587	5.350	.000	.002826	.006095
MANAGER-PERFORMANCE	.027508	.014689	3400.933	1.873	.061	-.001292	.056309
MANAGER-TIMEX PERFORMANCE	.021666	.009694	3991.756	2.235	.025	.002660	.040672

a. Dependent Variable: PERFORMANCE.

Table 1: Outcome of the analysis of the all employees model

Using table one, the first four hypotheses for all employees can be tested. Starting with the hypothesis that training is positively correlated with performance, we can see that $p<0.05$ and the beta is .002315. This means the null hypothesis can be rejected and H1 can be assumed, meaning that training has a positive effect on employee performance. The second hypothesis states that tenure is positively correlated with employee performance, even though the effect is significant ($P<0.001$) the effect is negative and therefore H2 cannot be accepted. H3 states that commitment and employee performance are positively correlated, this can be confirmed as the beta is positive (0.00446) and the p-value is significant ($p<0.001$). Hypothesis 4A&B cannot be confirmed as the manager performance statistic is not significant ($p>0.05$), this means the interaction effect (whilst being significant) cannot be accepted either as it moderates a relationship that is not statistically significant. In summary, only H1 and H3 can be accepted, H2, H4A and H4B have to be rejected. In normal multiple regression analyses there is an R^2 statistic that allows an interpretation of what percentage of total variance in the dependent variable is explained by the independent variables. Linear mixed models does not allow for this as there are multiple error terms meaning the software cannot compute an R^2 statistic. The betas seem small, but all the independent variables exist on a much larger scale than the dependent variable. The dependent variable only ranges from one to five whereas the independent variables can range from zero to upwards of one hundred.

§ 4.2.4 Building the "financial group" model

The model needs to be rebuilt for the financial group (AD only) as the sample size is reduced and the distribution of observations may have changed. Appendix D will have all information regarding the model dimensions, assumptions and information criteria. As the process for deciding the optimal model is completely the same, the following tables should provide all necessary information. The table shows how the model is built step by step, introducing each variable as fixed and then as random. The parameters and AIC scores for each step in creating the model are then used to calculate a Chi-square score to see if the model improves when variables are introduced as random as opposed to fixed.

Variable being added	Model parameters	AIC	Chi-square
Intercept fixed	4	6227.335	
Intercept random	5	5582.496	P<0.0001
Training fixed	6	5552.836	
Training random	7	Error	Redundant
Tenure fixed	7	5341.401	
Tenure random	9	5330.698	P<0.0001
Commitment fixed	10	5314.154	
Commitment random	13	Error	Redundant
Manager performance fixed	14	Error	Redundant
Manager performance random	18	Error	Redundant

Table 2: Optimizing the financial group model (part 1)

As can be seen, after introducing manager performance into the model, as an independent variable, the software returns an error (as shown in the table where the AIC score should be). This means there are redundant parameters, meaning the model becomes more complex without it improving/ fitting the data better. After removing tenure as a random slope, this error is resolved.

Variable being added	Model parameters	AIC	Chi-square
Manager performance fixed	9	4926.869	
Manager performance random		Error	Redundant
Time spent on management duties interaction effect fixed	10	4910.412	
Time spent on management duties interaction effect random	12	4914.126	Model gets worse
ARVE fixed	11	4783.885	
ARVE random	13	4755.553	< 0.00001
ARVE interaction partly fixed	14	4757.290	
ARVE interaction partly random	17	Error	Redundant
ARVE interaction mostly fixed	15	4.749.558	
ARVE interaction mostly random	18	Error	Redundant
MARK-UP fixed	16	4718.321	
MARK-UP random	19	4703.483	< 0.00001
MARK-UP interaction partly fixed	20	4700.405	
MARK-UP interaction partly random	24	Error	Redundant
MARK-UP interaction mostly fixed	21	4702.069	
MARK-UP interaction mostly random	25	Error	Redundant

Table 3 :Optimizing the the fianancial group model (part 2)

To summarize, the model will consist of a random intercept varying between subjects, random slopes for ARVE and Mark-up (using an unstructured covariance matrix) and fixed slopes for all other variables.

§ 4.2.5 Checking the assumptions for the " financial group" model

The assumptions will be checked in the exact same way as was done under §4.2.2. Both the variable types as the non-zero variance assumption stay exactly the same. The variables for exceptional personal circumstances have been turned into dummy variables to allow for inclusion in the model. Appendix D contains a correlation matrix to test the perfect multi-collinearity assumption. There is no perfect collinearity, there is strong correlation between the two interaction variables for exceptional personal circumstances " mostly" (0.498) this is likely cause by the nature of the financial data as the amount of hours billable to the customer are also related to the effective rate a consultant has. Secondly, if a consultant is in the mostly category, it goes for both financial measures. Lastly the observations in the mostly category are extremely small as compared to the total sample size (not more than four percent in any year). All in all it can be assumed that this assumption is fulfilled despite this. Once again the assumption of homoscedasticity is difficult to confirm. The scatterplot in appendix D shows the same pattern as the of the entire group, with somewhat fewer observations in the low end. Log transforming the dependent variable once again does not improve the situation. Homoscedasticity will thus be interpreted the same as in the " all employees model" assumed, but with caution. The linearity assumption does not change from the " all employees model" either as tenure is still included in this model. The errors are normally distributed as suggested by the histogram and descriptive statistics table in appendix D. In summary, the fulfilment of assumptions does not seem to change from the " all employee model" except for the stronger collinearity of the interaction variables that were created using the dummy variables. This should, however not pose a problem for the model.

§ 4.2.6 Hypothesis testing of the financial group model

Estimates of Fixed Effects[a]

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	3.089432	.095548	2421.832	32.334	.000	2.902068	3.276797
TRAINING	.006045	.001652	2137.945	3.659	.000	.002805	.009285
TENURE	-.023010	.001760	966.951	-13.075	.000	-.026463	-.019556
COMMITMENT	.005304	.001102	2083.701	4.813	.000	.003143	.007464
MANAGER-PERFORMANCE	.046165	.018317	2162.775	2.520	.012	.010245	.082085
MANTIMEx PERFORMANCE	.007912	.011835	2394.596	.669	.504	-.015295	.031120
financial ARVEcen	.005076	.000645	498.956	7.865	.000	.003808	.006344
ARVExPartly	6.612870E-5	.002094	935.205	.032	.975	-.004044	.004176
ARVExmostly	.004702	.002206	381.381	2.131	.034	.000363	.009040
MARKUPcen	.191596	.034983	487.082	5.477	.000	.122860	.260332
MARKUPxPartly	.260177	.112845	673.678	2.306	.021	.038607	.481747
MARKUPxMostly	.076633	.131717	760.358	.582	.561	-.181940	.335206

a. Dependent Variable: PERFORMANCE.

Table 4: Outcome of the analysis of the financial group model

Table four displays the outcome of the " financial group model". It becomes clear that the outcomes are not the same as the " all employees" model.

Starting with the intercept, its mean value lower with a higher standard deviation. H1 can still be assumed as the score is significant (P<0.001). The interesting part is that the P is smaller and the beta is almost three times as large as in the " all employees" model. The interpretation remains the same, training is positively correlated with employee performance. Tenure still displays the same behaviour as both the significance score and the negative beta are similar meaning H2 cannot be assumed as tenure is shown to be negatively correlated with employee performance. Commitment also displays similar behaviour amongst both groups. The "financial group" commitment beta is larger, suggesting a greater effect. H3 can be assumed for the financial group meaning that commitment and employee performance are positively correlated. One of the most interesting differences between the two models, is the fact that management performance is, first of all significant and the beta for the manager-performance-employee-performance relationship is more than twice as large. This means that, contrary to the "all employees" model, H4A can be assumed for the " financial group" model. This means that in the " financial group" model, the manager performance is positively correlated with employee performance. The time spent on management duties however, did have a significant effect in the " all employees" model but not in the " financial group" model meaning H4B cannot be assumed. Time spent on management duties does not seem to moderate the relationship between manager performance and employee performance

The Hypotheses concerning financial performance (H5A&B) are tested using two variables (ARVE and Mark-up) and four interaction variables for the exceptional personal circumstances. The table shows ARVEcen and Mark-upcen. This indicates that the variables' means have been centred around zero in order to check for the interaction effects. Starting with ARVE and Mark-up to see if financial performance matters (H5A), it can clearly be seen that both variables are significant (p<0.001). Important to note is that the betas show very different numbers, this is because of the way the underlying data is entered. ARVE is entered on a scale of zero to one hundred (utilization rate based on billable hours and total hours), whereas Mark-up is a financial rate based on the hourly rate of a consultant divided by the salary costs. Mark-up is thus displayed as 1.00 for consultants that "earn as much as they cost" . The statistical software calculates the slope with one step increments (earning your salary two times over or three times over). This means that in order to make Mark-up and ARVE somewhat comparable, the beta of Mark-up should be divided by one hundred giving a beta of 0.00191596. This means that Mark-up has a weaker effect than ARVE. Making this comparison is difficult as ARVE should theoretically never exceed one hundred percent whereas Mark-up should ideally always be above one (which is also mostly the case as the mean is usually upwards of 1.8). In any case, H5A can be assumed as both financial measures are significant and display a positive slope. Financial performance therefore positively correlates with employee performance.

Lastly, checking H5B, immediately shows a relationship that is not in accordance with the hypothesis. Meaning H5B should be rejected. The interaction variables all show positive relationships, indicating that ARVE and Mark-up have a greater effect on the performance score of an employee when they deal with exceptional personal circumstances. Additionally not all interaction variables are significant. Even though the hypothesis cannot be assumed, the statistical data still shows an unexpected and interesting picture (this will be discussed further in chapter five). Exceptional personal circumstances do not seem to moderate the relationship between financial performance of and employee performance.

CH.5 CONCLUSION AND DISCUSSION

The statistical analysis and hypothesis testing suggests that there are relationships between the tested independent and dependent variables. This chapter will start with the interpretation of the results in the "all employee" model, then move on to the "financial group" model and possible directions for future research.

§ 5.1 Interpreting the "all employees" model

Starting with the intercept of the "all employees" model, it can interpreted as such that all employees start with a performance score of around 3.2. The intercept is denoted as random in the analysis, this does not mean that the intercept is actually random, but that it may vary between subjects which is also the case for random slopes.

The interpretation of the intercept could be that every employee, in theory would start off with a three in performance after which other factors will decide what the total performance score will be. This would mean that most employees will function according to expectation of their roles/function/grade reasonably easily or standardly.

Training has a positive effect on the performance of individuals as every training should in theory increase the performance score by 0.002315. This effect is rather small. With one hundred training sessions, the employee performance would only increase by 0.2. The data for training is not normally distributed, skewed to the right, unstable and has a large standard deviation. This could all influence the statistic and thus the displayed "effectiveness" of training may be small as a result of the way the data is distributed. Performance being measured on a five point scale whilst training is measured as a frequency (upwards of a hundred training sessions have been completed in the test period in some cases) is also a reason why this effect may appear small.

Tenure displays a negative effect, despite the fact that job knowledge and skills are theorized to increase over time and thus could yield performance increases. There are multiple ways of interpreting this statistic. First of the relationship was never theorized to be linear, thus the overall effect of Tenure may be negative but the effect in earlier years in one's career, may be positive. Secondly, the employee performance scores are based on whether an employee falls short of, meets or exceeds expectations for a certain role. If an employee consistently exceeds expectations, he or she should be put in a different position/grade as the performance indicates that this employee may be able to handle more than is currently entrusted to him or her. Meaning that over longer periods of time, employees should generally be put in positions where they perform as is expected for that position and their performance would revert to the mean (of three). The employee will than proceed to stay in that position as long as he or she performs as expected, until the organisation and the employee part ways or the employee takes a different role on the same level. As the data for this research is only gathered over the last three years and being promoted takes time, it is impossible to check for this train of thought.

Commitment shows an interesting picture as the theory stated that commitment to the organisation should not yield significant results in terms of performance increase. The analysis of the "all employee" group shows that it is both significant and a larger increase in performance than the training variable. This would indicate that, theoretically, investing in commitment would yield a larger performance increase per "step" than investing in training the employee base. It cannot be said however that commitment is completely separate from training activities as disallowing for training and personal development may in turn negatively affect commitment, as well as the fact that the betas are not directly comparable. If the results from the analysis are combined with the descriptive statistics concerning commitment, it can be seen that commitment could be improved as the mean score is only 47. Meaning that on average only 47% of questions answered by subjects in the sample had a positive response.

Lastly the manager-performance-employee-performance link does not seem to hold up in the all employees model. This could indicate that employees are independent to such a degree that their manager barely has any influence on how they perform. It could also be the case that the performance score of the manager does not accurately reflect the people management performance of a manager as a manager has more tasks than supporting his or her employees. This was partially controlled for using the time spent on management duties interaction variable but even with such a variable it could be possible that management duties did not entail direct leadership activities.

§ 5.2 Interpreting the "financial group" model

Comparing the outcome of both models yields interesting results. Although one must keep in mind that the amount of cases is much lower (from over 1,500 to about 990), and the subjects in the financial group were also part of the "all employees" model.

Starting with the intercept, as previously mentioned, it seems that the "financial group" has an overall lower starting point compared to the "all employees" group. The incept is still around three, so there is no shockingly large difference.

An interesting difference is the training statistic. This statistic seems to have a much larger impact, to the point that it is one of the largest betas and thus performance increases "per unit". Meaning that receiving "one unit" of training increases the performance more than increasing commitment with "one unit". This would suggest that training has a larger effect for AD employees as opposed to the group as a whole. Although, as suggested earlier, one must be cautions when drawing such conclusions as the two models are not easily comparable. The fact that the p-value of training is smaller in case of the "financial group" model is also interesting. Large sample sizes increase the chance a relationship is found to be significant as the degrees of freedom increase. The fact that the p-value of training is lower in the group that has fewer subjects and thus fewer degrees of freedom, seems to suggest that the relationship is easier and more reliably established in AD (this is also reflected in the higher t-score). This would mean that the relationship is less likely to be a coincidental find in the data in the "financial group" model.

Tenure still holds a negative relationship with performance. The effect does appear to be somewhat smaller. Commitment shows the opposite trend as its effect seems to increase rather than decrease. The AD group already has a larger mean when it comes to commitment.

A surprising and interesting difference between the two models is the fact that manager performance does hold a significant relationship with employee performance in this case. Not only is the effect significant, it also appears larger than any other effect (except mark-up but the reason for this was discussed earlier). The size of this effect is also partly attributable to the form of the data as manager performance and employee performance are both five point scales. The total effect of manager performance could be smaller than other variables since the maximum score for manager performance is five, whereas there is no theoretical limit to the amount of training one can receive (there are practical limits of course). The question remains: "Where does the difference in significance levels come from?"

One explanation could be that employees who are out in the field, receive more attention from their manager. As an employee is the "face" of the company, a manager may want to monitor, support or direct employees more actively. A second possibility is that the performance score of the manager reflects the people management performance more accurately in the AD sample than it does in the entire sample. In any case, it can be seen that high performing managers are favourable to have to increase employee performance. Of course employee performance is not the only reason an organisation would be interested in good performing management. The time spent on management duties interaction variable is not significant in this model however. This could be because of the fact that management duties are not exactly the same as direct leadership. A second reason could be that the amount of employees under one manager dictates the time a manager spends purely on management duties, thus one would need to control for this variable (amount of employees per manager) in order to see if this is the case.

Lastly, the financial variables show that an employee with a higher ARVE and Mark-up will have a better overall employee performance appraisal score. ARVE and Mark-up are not easy to compare but it would seem that ARVE has a larger effect than Mark-up if Mark-up is returned to one percent return instead of a hundred percent return form (meaning if the effect of Mark-up is divided by one hundred). This seems odd as increasing the amount of profit a consultant brings in seems more important than the utilization rate. The reason for this could be the way Mark-up is constructed. The consultant in question cannot fully control the rate at which he or she is providing the service to the customer. The same goes for the salary costs as these are not fully controlled by the consultant, nor is it logical that a consultant would willingly reduce his or her salary to increase the Mark-up. A consultant has more power over his or her own utilization rate, since finding projects one can work on is one of the consultants responsibilities. Of course factors such as the state of the market influence the utilization rate of a consultant as well.

Consultants who are in higher grades and are therefore more expensive may have a lower Mark-up as well because such a consultant will have a higher salary and even higher salary costs (as salary costs contain more than just the salary). In order to keep the same Mark-up, a consultants rate would have to increase just as much which could compromise the competitive position of the organisation. It is logical for the rate of a consultant to increase with his or her seniority, but this increase could be smaller than the increase in salary costs.

The interaction variables for the financial variables are not all significant nor do they moderate the relationship between the financial variables and employee performance negatively, thus the hypothesis could not be assumed. It is still interesting to try and interpret this information as the ARVExmostly interaction variable and Mark-upxpartly variable do seem to be significantly related to employee performance. This would mean that, in the case of ARVExmostly, every percent of ARVE would have a larger impact on employee performance, compared to an employee that does not deal with exceptional personal circumstances. The same goes for Mark-upxpartly where an employee dealing with personal circumstances would, per one step increase in Mark-up, "gain" three times the amount of employee performance as opposed to an employee that is not dealing with exceptional personal circumstances. One way to interpret this is that a manager is more lenient when considering ARVE and Mark-up in those situation as opposed to ignoring or paying less mind to them (as was hypothesised). In any case, H5B could not be confirmed.

§ 5.3 Directions for future research

First of all it might prove worthwhile to further investigate the training variable. This research only took into account the amount of training an employee had completed during the test period. Investigating whether different kinds of training have different overall effects can prove useful in determining what specifically to invest in. The length of the training, type of the training (classroom based or e-learning), whether it is an internal or external training, the training discipline, the amount of hours spent on a training, the nature of the training (knowledge or skill based), and so forth, may all have different effects on the overall employee performance of an individual. Finding the training composition that is either most effective (total performance increase) or efficient (performance increase per euro spent) could assist in deciding what type of training to invest in. Experience could also be researched further by for instance including the amount of projects or contracts an employee has worked on, the amount of customers an employee has served or the total length of time an employee has actually spent with a customer. Commitment research on different types of commitment or different targets of commitment and how each relates to employee performance could also prove useful. If it indeed shows that commitment has a greater impact on performance if employees are more committed to their manager as opposed to the organisation it could allow for changes in the way employees are managed. Manager performance is still a somewhat crude measure to use in order to see if there is a relationship between front line management and employee performance. One alternative is to let employees rate their manager and see if high manager ratings coincide with high employee performance. Lastly, financial performance has many different calculated rates, only two were used in this research. Investigating whether other rates show similar results may be interesting. At the start of this project, employee potential and assessment scores (scores on an assessment performed by an external organisation, to see whether an employee is fit for a certain function), were intended to be taken into account. However, time constraints prevented this from happening. These are still interesting variables to look at in possible new research.

CH.6 LIMITATIONS AND PRACTICAL IMPLICATIONS

§ 6.1 Limitations

As is the case with all studies, this study has limitation one has to keep in mind whilst interpreting the results. Most HR studies linking HR to performance, have been cross sectional in nature (Wright, Gardner, & Moyniha, 2003). By using a longitudinal study, it is attempted to overcome the inherent limitations of a cross sectional study. This allows for better inferences concerning causality. The longitudinal study still has some problems as third variables are not always accounted for since there is only one group and no control. Since there is no "treatment" in this particular research it is less likely to prove to be a problem although organisation wide changes might still have an impact on the research results.

Additionally, even though this study is retrospective in nature, as the data of the last three years is gathered, it does not suffer from potential problems of respondents not being able to recall certain information because only data from IT-systems are used. However, data from IT-systems may contain errors, just like wrongly remembered events. Data being incorrectly entered and not adjusted later on, still is less likely to happen then a person remembering things wrongly. Lastly, validating whether the data is actually correct is difficult as the researcher was not present during the time of data entry. All that could be done was correct for irregularities and inconsistencies in the data.

The view of the direct superior of an employee carries a lot of weight, however the employee performance scores are not based on the views of a single manager but on the opinion of a committee of involved managers. Therefore bias based on the view of a single person can be reduced.

The link between frontline managers and employees requires linking the employee performance to the frontline manager performance. Studies on leadership and management performance suggest investigating more in-depth variables such as the relationship between frontline managers and their employees, trust and so forth. However this is not possible as the data is not available. Secondly the manager that was in charge on the first of January of a certain year, was assumed to stay the manager of that employee for the rest of the year, thus it is possible that a manager has changed posts or left the organisation during the year whilst the analysis did not account for that. The time spent on management duties is also influenced by whether managers correctly book on management duties as this information is directly taken from the financial booking data. Additionally the performance scores of managers are not solely based on management activities (which is why time spent on management duties is used). Lastly, there are missing values for management performance scores as well as time spent on management duties. This could influence the results. Although the linear mixed model approach partially solves this problem by estimating the value of missing values by using the rest of the data, if the missing values correlate with either the independent variables or third variables, the results could be biased.

The sample choice allows for increased internal validity as legislation, culture and other such factors do not vary across units. External validity is limited, as only a Dutch branch of a single business unit of a single firm is involved in the study. This study could be cautiously generalised to the Dutch IT consultancy branch keeping differences between organisations in mind. Although the organisation being studied, operates on a global scale, generalising this study to the global IT consultancy branch, requires cultural and institutional factors to be taken into account, which makes it more difficult. Another generalisation difficulty stems from the fact that the linearity assumption for the analyses could not be fulfilled. This means that one must be cautious when generalising the findings to a larger population. This is not only the case for the tenure relationship but for all found relationships as the tenure statistic does influence the other variables in the same model.

Information regarding commitment could not be obtained on an individual level for privacy reasons and therefore has to be aggregated to a higher level which allows for possible interference from third variables. If all commitment scores could have been obtained on an individual level the beta and even the significance levels could have differed. The process of assigning commitment scores based on the division and filtered to grade would at the very least mean that at least a mean of ten employees is used, including employees not even part of the sample. Meaning that a part of the variance in the scores may have been lost and/or contaminated by subjects outside of the sample. Commitment scores have also been influenced by events leading to a large amount of employees losing their jobs. All in all this affects the validity of the results in a couple of ways: First of all, the commitment scores do not vary as much as they would have if they would have been obtained individually. The lower variance in the scores may lead to either over- or underestimating the beta of the relationship. This means that the relationship in reality can be either stronger or weaker than was found in this analysis. Secondly, if the scores of individuals vary enough, it may be found that the relationship is not significant at all. There is no way to check for the distribution of scores, frequencies, medians or any other statistical measure that allows for inferences concerning the distribution of the commitment scores around the mean that has been used. If the distribution is highly skewed, or otherwise unfavourably distributed (for instance having large outliers that affect the mean score of the division) using the individual scores may in fact prove that the significant relationship was based on means that do not represent the commitment of individuals correctly. In summary, one has to be cautious when interpreting the results for commitment because both the significance and the strength of the relationship may be a result of the fact that only mean scores were available as opposed to individual scores.

The performance appraisal scores are approximately normally distributed. The organisation has given management the instruction to be more critical at assessments as previous appraisal scores were too high and should in theory be normally distributed. This change has been made four years ago, as the data used in this research project is gathered over the past three years, it does not suffer from bias due to this change. The statistical effect of making appraisal scores more normally distributed on the outcomes of the hypothesis testing, should be minimal. The managers are not given a certain " limited amount" of scores they can hand out. After all appraisals have been completed, the management teams check to see whether their distribution of scores is close to the theoretical distribution of scores. If these to distributions are too far apart, some scores will be adjusted. The data quality of the HR information should be high and available, information concerning training and previous experience may be incomplete and therefore subject to validity issues. The effect of training may also be delayed, this would mean that the performance increase as a result of training will not occur until later in that year or even in the next year. This may lead to the relationship being underestimated. There may also be some missing value issues relating to exceptional personal circumstances.

Another limitation is the fact that the analysis in this thesis does not include a set of control variables for demographic information such as gender, age, grade, sector, and so forth. This is the case because of practical reasons. Including such control variables increases the complexity of the model meaning a lot of extra time needs to be dedicated to analysing variables, model assumptions, model building, and so forth while these variables were not part of the hypotheses or the theory. It was simply not possible within the time frame of this thesis.

Lastly, for the purposes of this thesis, it is assumed that the output variables are continuous variables. This is done because continuous variables allow for more types of statistical analysis. Using ordinal measures as interval variables is possible but introduces some bias. Using an ordinal measure with five categories (performance appraisal scores) as an interval variable should introduce a very small bias. The biggest mean difference with four categories is -0.127, occurring when there is high correlation with the continuous equivalent (0.901) resulting in the relationship between variables looking less strong than is actually the case (0.744 instead of 0.901) (Bollen & Barb, 1981). Johnson & Creech (1983) advocate caution when using four category scales, especially with small sample sizes, the sample size however should not be a problem as the sample used in this case is over 1.500. However as can be seen in the scatterplots used to check for homoscedasticity, this makes the use of visual representations of data more difficult.

§ 6.2 practical implications

Taking into account the analyses, interpretations of the analyses and the limitations, what practical implications can be derived from this research?

First of all this research displays that even in the highly dynamic environment of the ICT consultancy sector, the general idea of the AMO model can be applied. The data does show that there are cases of employees not doing any training during certain years. As is suggested by the analysis, managers should incentivise employees to at least do some amount of training every year. Past simply incentivising training, situations that work as obstacles to develop oneself should be avoided. One example of such a situation in the organisation being studied is the fact that neither ARVE nor Mark-up seems to include anything training related. This would mean that if an employee takes time to train him or herself during work hours, that employee would be punished in terms of financial performance. This forces the employee to take training courses outside work hours if that employee does not want to compromise his or her financial performance. Other organisations relying on financial rates as a means to asses/ judge employee performance could run into the same problem. Taking one step back, the contract between a consultant and a customer could include a clause allowing the consultant to take a certain amount of time to train oneself if this does not exist already (of course this would have to be discussed and planned accordingly with the customer well before the training takes place and the customer should not have to pay for the hours the consultant is not there). This however means that an amount of otherwise billable hours would be lost. Whether this is a positive trade-off is impossible to calculate with the current data in this research.

Continuing on with the tenure statistic, attracting and binding you employees to the organisation, with the idea in mind that these employees should not stay with the organisation or within the same department/ function seems to be the correct choice (which is also not out of the ordinary currently). Dutch legislation does make it harder to end employment contracts after a certain amount of years (three). Investing in outplacement to ease the step for more senior (in terms of tenure but not necessarily age) employees to a different employer, may allow for more efficient demographic management of the employee base. Investing in job rotation may limit the negative effect of tenure.

The commitment statistic with all its limitations still shows a relationship which is also argued in the theory, to exist. As the mean scores for the GES on employee commitment do not seem to be high, increasing commitment may be worthwhile. After all, as can be seen in the theory, commitment isn't solely related to employee performance but also social capital, turn over and other such important factors which are important for effective SHRM within an organisation. ICT consultancy (or any type of consultancy for that matter) inherently suffers from the problem that consultants do not spend much time with the organisation as most, if not all, their time is spent with the customers. This makes cultivating commitment more difficult, but not less important.

As mentioned previously, the performance appraisal scores for managers are not entirely representative of the theoretical constructs that are commonly used to ascertain a management-employee performance relationship. Implementing a systematic way to track the performance of managers concerning their management duties, will allow for better analyses and a better representation of how a manager duties are performed. Insight in manager duty specific performance could already prove valuable for an organisation without even considering finding causal relationships.

All in all this research has only laid a foundation, there are many more subjects and variables that could be investigated more in depth using the same or a similar process this research project used.

REFERENCES

Agarwala, T. (2003). Innovative human resource practices and organizational commitment: an empirical investigation. *The International Journal of Human Resource Management*, 175-197.

Allen, T. D., & Rush, M. C. (1998). The Effects of Organizational Citizenship Behavior on Performance Judgments: A Field Study and a Laboratory Experiment. *Journal of Applied Psychology*, 247-260.

Barney, J. (1991). Firm Resources and Sustained Competitive Advanatage. *Journal of Management*, 99-120.

Becker, B., & Gerhart, B. (1996). The Impact of Human Resource Manageent on Organizational Performanc: Progress and Proespects. *The Academy of Management Journal*, 779-801.

Becker, T. E., Billings, R. S., Eveleth, D. M., & Gilbert, N. L. (1996). Foci and Bases of Employee Commitment: Implications for Job Performance. *Academy of Management Journal*, 464-482.

Bollen, K. A., & Barb, K. H. (1981). Pearson' s R and Coarsely categorized Measures. *American Sociological Review*, 232-239.

Bowen, D. E., & Ostroff, C. (2004). Understanding HRM-Firm Performance Linkages: The Role of the "Strength" of the HRM System. *Academy of Management Review*, 203-221.

Boxall, P. (1996). The strategic HRM debate and the Resource-Based View of the Firm. *Human Resource Management Journal*, 59-75.

Buller, P. F., & McEvoy, G. M. (2012). Strategy, human resource management and performance: Sharpening line of sight. *Human Resource Management Review*, 43-56.

Ceylan, C. (2013). Commitment-based HR practices, different types of innovation activities and firm innovation performance. *The international Journal of Human Resource Management*, 208-226.

Chadwick, C. (2010). Theoretic insights on the nature of performance synergies in human resource systems: Towards greater precision. *Human Resource Management Review*, 85-101.

Chen, X.-P., Eberly, M. B., Chiang, T.-J., Farh, J.-L., & Cheng, B.-S. (2014). Affective Trust in Chinese Leaders: Linking Paternalistic Leadership to Employee Performance. *Journal of Management*, 796-819.

Coff, R. W. (2002). Human Capital, Shared Expertise, and the likelihood of Impasse in corporate Acquisitions. *Journal of Management*, 107-128.

Colakoglu, S., Lepak, D. P., & Hong, Y. (2006). Measuring HRM effectiveness: considering multiple stakeholders in a global context. *Human resource management review*, 209-218.

Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O., & Yee Ng, K. (2001). Justice at the Millennium: A Meta-Analytic Review of 25 Years of Organizational Justice Research. *Journal of Applied Psychology*, 425-445.

Davis-Blake, A., Broschak, J. P., & George, E. (2003). Happy Together? How Using Nontandard Workers Affects Exit, Voice, and Loyalty Among Standard Employees. *Academy of Management Journal*, 475-485.

Delery, J. E., & Doty, H. D. (1996). Modes of Theorizing in Strategic Human Resource Management: Tests of Universalistic, contingency, and Configurational Performance predictions. *Academy of Management Journal*, 802-835.

Dulebohn, J. H., & Johnson, R. D. (2013). Human resource metrics and decision support: A classification framework. *Human Resource Management Reivew*, 71-83.

Farndale, E., & Paauwe, J. (2007). Uncovering competitive and institutional drivers of HRM practives in multinational corporations. *Human Resource Management Journal*, 355-375.

Fey, C. F., Morgulis-Yakushev, S., Park, H. J., & Björkman, I. (2009). Opening a black box the relationship between HRM practices and firm performance: A comparison of MNE subsidiaries in the USA, Finland and Russia. *Journal of International Business Studies*, 690-712.

Graen, G. B., & Uhl-Bien, M. (1995). Relationship-based Approach to Leadership: Development of Leader-Member Exchange (LMX) Theory of Leadership Over 25 Years: Applying a Multi-Level Multi-Domain Perspective. *Leadership Quarterly*, 219-247.

Jackson, S. E., Schuler, R. S., & Jiang, K. (2014). An Aspirational Framework for Strategic Human Resource Management. *The Academy of Management Annals*, 1-56.

Jiang, K., Lepak, D. P., Han, K., Hong, Y., Kim, A., & Winkler, A.-L. (2012). Clarifying the construct of human resource systems: Relating human resource management to employee performance. *Human Resource Management Review*, 73-85.

Jiang, K., Lepak, D. P., Hu, J., & Baer, J. C. (2012). How Does Human Resource Management Influence Organizational Outcomes? A Meta-Analytic Investigation of Mediating Mechanisms. *Academy of Management Journal*, 1264-1294.

Jiang, K., Takeuchi, R., & Lepak, D. P. (2013). Where do We Go Frome Here? New Perspectives on the Black Box in Strategic Human Resource Management Research. *Journal of Management Studies*, 1448-1480.

Judge, T. A., & Ferris, G. R. (1993). Social Context of Performance Evaluation Decisions. *The Academy of Management Journal*, 80-105.

Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The Resource-Based View: A Review and Assessment of Its Critiques. *Journal of Management*, 349-372.

Lepak, D. P., & Snell, S. A. (1999). The Human Resource Achitecture: Toward a Theory of Human Capital Allocaiton and Development. *Acedemy of Management Review*, 31-48.

Lepak, D. P., & Snell, S. A. (2002). Examining the Human Resource Architecture: The Relationships Among Human Capital, Employmnt, and Human Resource Configurations. *Journal of Management*, 517-543.

Lepak, D. P., Liao, H., Chung, Y., & Harden, E. E. (2006). A conceptual review of human resource management systems in strategic human resource management research. *Research in Personnel and Human Resourece Management*, 217-271.

Levy, P. E., & Williams, J. R. (2004). The Social Context of Performance Appraisal: A Review and Framework for the Future. *Journal of Management*, 881-905.

Lowe, K. B., Kroeck, K. G., & Sivasubramaniam, N. (1996). Effectiveness Correlates of Transformational and Transactional Leadership: a Meta-Analytic Review of the MLQ Literature. *Leadership quarterly*, 385-425.

Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, Continuance, and Normative Commitment to the Organization: A Meta-analysis of Antecedents, Correlates, and Consequences. *Journal of Vocational Behavior*, 20-52.

Organ, D. W., & Ryan, K. (1995). A Meta-Analytic Review of Attitudinal and Dispositional Predictors of Organizational Citizenship Behavior. *Personnel Psychology*, 775-802.

Paauwe, J., & Boselie, P. (2003). Challenging 'strategic HRM' and the relevance of the institutional setting. *Human Resource Management Journal*, 56-70.

Porter, M. E. (1979). How competitive forces shape strategy. *Harvard Business Review*, 137-145.

Priem, R. L., & Butler, J. E. (2001). Is the Resource-Based "View"a Useful Perspective for Strategic Manaement Research? *Academy of Management Reviw*, 22-40.

Purcell, J., & Hutchinson, S. (2007). Front-line managers as agents in the HRM-performance causal chain: theory, analysis and evidence. *Human Resource Management Journal*, 3-20.

Richard, D., & Creech, J. C. (1983). Ordinal Measures in Multiple Indicator Models: A Simulation Study of Categorization Error. *American Sociological Review*, 398-407.

Román, S., Riuz, S., & Munuera, J. L. (2002). The effects of sales training on sales force activity. *European Journal of Marketing*, 1344-1366.

Schmidt, F. L., Hunter, J. E., & Outerbridge, A. N. (1986). Impact of job experience and ability on job knowledge, work sample performance, and supervisory ratings of job performance. *Journal of Applied Psychology*, 432-439.

Steers, R. M. (1977). Antecedents and Outcomes of Organizational Commitment. *Administrative Science Quarterly*, 46-56.

Stone, D. L., Lukaszweski, K. M., Stone-Romero, E. F., & Johnson, T. (2013). Factors affecting the effectiveness and acceptance of electronic selection systems. *Human Resource Management Review*, 50-70.

Sturman, M. C. (2003). Searching for the Inverted U-Shaped Relationship Between Time and Performance: Meta-analyses the Experience/Performance, Tenure/Performance and Age/Performance Relationships. *Journal of Management*, 609-640.

Way, S. A., Lepak, D. P., Fay, C. H., & Thanker, J. (2010). Contingent Workers' Impact on Standard Employee Withdrawal Behaviors: Does What You Use Them for Matter? *Human Resource Management*, 109-138.

Winne, S., & Sels, L. (2010). Interrelationships between human capital, HRM and innovation in Belgian start-ups aiming at an innovation strategy. *The International Journal of Human Resource Management*, 1863-1883.

Wright, M. P., Gardner, M. T., & Moyniha, M. L. (2003). The impact of HR practices on the performance of business units. *Human Resource Management Journal*, 21-36.

Wright, P. M., & McMahan, G. C. (1992). Theoretical Perspectives for Strategic Human Resource Management. *Journal of Management*, 295-320.

Wright, P. M., Gardner, T. M., Moynihan, L. M., & Allen, M. R. (2005). The Relationship Between HR Practices and Firm Performance: Examining Causal Order. *Personnel Psychology*, 409-446.

Zhang, B., & Morris, L. J. (2014). High-performance work systems and organizational performance: testing the mediation role of employee outcomes using evidence from PR China. *The International Journal of Human Resource Management*, 68-90.

APPENDIX A: OPERATIONALISATION OF VARIABLES

Tables with a summary of the operationalisation

Variable	Pers.nr	Sector 2012, 2013, 2014			Tenure end of 2012, 2013, 2014			Grade start 2012, 2013, 2014		
Meaning	Number for identifying employees	active, this is important as financial performance is different in the private and public sectors as opposed to application maintenance			Tenure (years of experience with the company) in a certain year			The Grade (certain level of professionalization) an employee belonged to at the time of measurement		
Measurement	Personnel records	Personnel records			Personnel records			Personnel records		
Measurement level.	Nominal	Nominal			Ratio			Nominal		
Time of measurement	X	1-1-2012	01-01-2013	1-1-2014	31-12-2012	31-12-2013	31-12-2014	1-1-2012	1-1-2013	1-1-2014
Belonging to Hypotheses	X	H5 A&B			H2			X		
Theoretical concept	X	X			Abilities			X		
Theoretical construct	X	X			Experience			X		
Remarks	Does not change under any circumstance, is the same in every system and once used will not be given to another employee even if the original one left the organisation	X			Based on the data an of when employee entered the organisation			X		

Table 5: Variables (part 1)

Table 6: Variables (part 2)

Variable	Performance 2012, 2013, 2014	Training 2012, 2013, 2014	Commitment 2012, 2013, 2014	Division 2012, 2013, 2014		
Meaning	The performance appraisal score of an employee over the given year	Training received during test period	Commitment score	Division a given employee was part of during a given year		
Measurement	Personnel records	Training related computer system	Global employee survey	Personnel data		
Measurement level.	Assumed to be interval	Ratio	Ratio	Nominal		
Time of measurement	Q4 of a year	Recorded whenever someone requested a training via the system	During employee survey (Q4)	1-1-2012	1-1-2013	1-1-2014
Belonging to Hypotheses	All	H1	H3	H3		
Theoretical concept	Dependent variable, employee outcomes	Abilities	Motivation	Motivation		
Theoretical construct	Employee performance	Training	Commitment	Commitment		
Remarks	Employees receive a performance score based on their performance throughout the year. This is based on their performance in their role, the goals that were met (which are set at the start of a year) and the opinion of the group of involved managers. one is the highest and five is the lowest score	There is a possibility that this information is incomplete as it is possible that not all training has been recorded in this system. The expectation is that this information is for at least 80% complete	Commitment is given per division and grade within that division for privacy reasons. Thus every employee within that division and grade will get the same commitment score	X		

Variable	Manager 2012, 2013, 2014	Manager performance 2012, 2013,	Time spent on management duties 2012, 2013, 2014
Meaning	The manager of an employee in a given year	The performance of a given manager in a given year	Amount of time a front line manager spent on management duties relative to total time worked
Measurement	Personnel data	Personnel data	Financial billing data
Measurement level.	Nominal	Assumed to be interval	Ratio (percentage)
Time of measurement	1-1-2012 / 1-1-2013 / 1-1-2014	Q4 of a given year	End of the year
Belonging to Hypotheses	H4A&B	H4A&B	H4A&B
Theoretical concept	Motivation	Motivation	Motivation
Theoretical construct	Front line management	Front line management	Front line management
Remarks	X	Not every manager spends the same time on management tasks as others do as they are also consultants at the same time. Their performance score reflects both of these activities	X

Table 7: Variables (part 3)

Table 8: Variables (part 4)

Variable	ARVE 2012	ARVE 2013	ARVE 2014	Mark-up 2012	Mark-up 2013	Mark-up 2014	Exceptional personal circumstances 2012, 2013, 2014
Meaning	External billable hours/ (total hours- vacation- maternity leave- works council hours)			Average earnings of an employee per hour divided by average costs of that employee per hour based on the employee's external hourly rate and internal salary costs of that employee			How much personal circumstances affect the financial performance of an employee
Measurement	Financial billing data			Financial billing data			Personnel data
Measurement level.	Ratio (percentage)			Ratio			Ordinal
Time of measurement	End of the year			End of the year			End of the year
Belonging to Hypotheses	H5A&B			H5A&B			H5B
Theoretical concept	Objective performance measure			Objective performance measure			Objective performance measure
Theoretical construct	Financial performance			Financial performance			Financial performance
Remarks	X			X			For this variable there are three categories: not applicable, partly or largely

Employee performance score meaning

One: Excels. The individual far exceeds the standards of the grade/ role, delivering exceptional performance that stood out from others in creating business benefit. This performance may include, outstanding innovation, exceptional client service, radical process improvement and exemplary role model behaviour in dealings with clients and/ or colleagues.

Two: Exceeds. The individual operates above the standards of the grade/ role and consistently produces performance that are above expected in terms of professional skills, initiative, added value to the business and client care while displaying role model behaviour

Three: Succeeds. The individual achieves the standards expected of his grade/ role.

Four: Needs improvement. The individual performance below the standard expected of his grade/ role or falls short on one or two key areas which need immediate improvement and/or the individual does not behave as desired.

Five: Needs significant improvement. The individual has performance problems that impact a significant part of his or her role and hinder development of themselves and the business. It is also possible that this employee displays significant behavioural issues.

Commitment questions GES

1. I am proud to work for the company
2. I would recommend the company to a friends or colleagues as a place to work
3. I am satisfied with the company
4. I plan to continue my career here
5. I plan to continue my career here for X number of months/ years/ I do not know
6. Have you taken action to find another job or do you expect this shortly?
    a. No
    b. Within the company
    c. Outside the company
    d. If the market picks up

APPENDIX B: DESCRIPTIVE STATISTICS AND FREQUENCIES

Descriptive statistics and frequencies 2012

Descriptive Statistics 2012 all employees (N=1,577)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Performance	1577	1.00	5.00	3.21	0.66	0.25	0.06	0.29	0.12
Training	1575	0.00	81.00	4.04	7.08	4.22	0.06	26.26	0.12
Tenure	1577	1.00	41.17	14.37	9.36	0.45	0.06	-0.75	0.12
Commitment	1577	25.00	71.00	47.28	12.16	-0.54	0.06	-0.80	0.12
Grade	1577	0.00	4.00	2.13	0.85	0.33	0.06	-0.40	0.12
Time spent on management duties	1522	0.01	0.92	0.62	0.24	-0.58	0.06	-0.74	0.13
Manager performance	1365	2.00	5.00	3.47	0.54	0.12	0.07	-1.01	0.13
Valid N (listwise)	1332								

Table 9: Descriptive Statistics 2012 all employees

Exceptional personal circumstance 2012 financial group (N=988)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N/A	896	90.7	90.7	90.7
	Partly	63	6.4	6.4	97.1
	Mostly	29	2.9	2.9	100.0
	Total	988	100.0	100.0	

Table 10: Exceptional personal circumstance 2012 financial group

Descriptive Statistics 2012 financial group (N=988)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Performance	988	1.00	5.00	3.32	0.66	0.27	0.08	0.33	0.16
Training	986	0.00	60.00	3.93	6.94	3.35	0.08	15.24	0.16
Tenure	988	1.00	41.17	12.84	9.20	0.58	0.08	-0.64	0.16
Commitment	988	26.00	71.00	53.95	6.27	-0.33	0.08	0.79	0.16
Grade	988	0.00	4.00	2.32	0.87	0.11	0.08	-0.43	0.16
Time spent on management duties	978	0.01	0.92	0.65	0.26	-0.95	0.08	-0.51	0.16
Manager performance	831	3.00	5.00	3.53	0.53	0.25	0.09	-1.19	0.17
ARVE	988	0.00	1.05	0.71	0.24	-1.58	0.08	1.91	0.16
MARK-UP	988	0.00	3.61	1.89	0.53	-1.04	0.08	3.31	0.16
Valid N (listwise)	822								

Table 11: Descriptive Statistics 2012 financial group

Grade frequencies 2012 (N=1,577)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trainee	6	.4	.4	.4
	Consultant	367	23.3	23.3	23.7
	Senior consultant	723	45.8	45.8	69.5
	Managing consultant	380	24.1	24.1	93.6
	Principal consultant	101	6.4	6.4	100.0
	Total	1577	100.0	100.0	

Table 12: Grade frequencies 2012

Grade frequencies 2012 " financial group" (N=988)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trainee	6	.6	.6	.6
	Consultant	154	15.6	15.6	16.2
	Senior consultant	432	43.7	43.7	59.9
	Managing consultant	305	30.9	30.9	90.8
	Principal consultant	91	9.2	9.2	100.0
	Total	988	100.0	100.0	

Table 13: Grade frequencies 2012 " financial group"

Descriptive statistics and frequencies 2013

Descriptive Statistics 2013 all employees (N=1,577)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Performance	1577	1.00	5.00	3.14	0.70	0.17	0.06	0.44	0.12
Training	1575	0.00	68.00	3.34	5.59	4.54	0.06	30.94	0.12
Tenure	1577	2.00	42.17	15.37	9.36	0.45	0.06	-0.75	0.12
Commitment	1577	28.00	83.00	46.57	12.06	0.67	0.06	0.06	0.12
Grade	1577	1.00	4.00	2.16	0.84	0.36	0.06	-0.43	0.12
Time spent on management duties	1488	0.03	1.00	0.60	0.30	-0.63	0.06	-1.18	0.13
Manager performance	1505	2.00	5.00	3.48	0.65	-0.16	0.06	-0.25	0.13
Valid N (listwise)	1416								

Table 14: Descriptive Statistics 2013 all employees

Exceptional personal circumstances 2013 financial group (N=978)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N/A	889	90.9	90.9	90.9
	Partly	60	6.1	6.1	97.0
	Mostly	29	3.0	3.0	100.0
	Total	978	100.0	100.0	

Table 15: Exceptional personal circumstances 2013 financial group

Descriptive Statistics 2013 financial group (N=978)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Performance	978	1.00	5.00	3.23	0.71	0.15	0.08	0.69	0.16
Training	976	0.00	68.00	2.31	4.64	5.75	0.08	54.35	0.16
Tenure	978	2.00	42.17	13.75	9.13	0.58	0.08	-0.64	0.16
Commitment	978	31.00	83.00	48.31	13.33	0.58	0.08	-0.63	0.16
Grade	978	1.00	4.00	2.38	0.84	0.17	0.08	-0.54	0.16
Time spent on management duties	976	0.03	0.96	0.58	0.32	-0.47	0.08	-1.41	0.16
Manager performance	909	2.00	5.00	3.59	0.64	-0.22	0.08	-0.12	0.16
ARVE	978	0.00	1.10	0.78	0.27	-1.56	0.08	1.63	0.16
MARK-UP	978	0.00	3.10	1.91	0.52	-1.59	0.08	4.60	0.16
Valid N (listwise)	905								

Table 16: Descriptive Statistics 2013 financial group

Grade frequencies 2013 (N=1,577)

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	*Consultant*	*344*	*21.8*	*21.8*	*21.8*
	Senior consultant	*737*	*46.7*	*46.7*	*68.5*
	Managing consultant	*393*	*24.9*	*24.9*	*93.5*
	Principal consultant	*103*	*6.5*	*6.5*	*100.0*
	Total	*1577*	*100.0*	*100.0*	

Table 17: Grade frequencies 2013

Grade frequencies 2013 " financial group" (N=978)

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	*Consultant*	*137*	*14.0*	*14.0*	*14.0*
	Senior consultant	*430*	*44.0*	*44.0*	*58.0*
	Managing consultant	*318*	*32.5*	*32.5*	*90.5*
	Principal consultant	*93*	*9.5*	*9.5*	*100.0*
	Total	*978*	*100.0*	*100.0*	

Table 18: Grade frequencies 2013 " financial group"

Descriptive statistics and frequencies 2014

Descriptive Statistics 2014 all employees (N=1,577)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Performance	1549	1.00	5.00	3.12	0.71	0.11	0.06	0.44	0.12
Training	1575	0.00	121.00	7.89	11.25	2.82	0.06	12.36	0.12
Tenure	1577	3.00	43.17	16.37	9.36	0.45	0.06	-0.75	0.12
Commitment	1577	27.00	91.00	47.53	11.44	0.81	0.06	0.67	0.12
Grade	1577	1.00	4.00	2.24	0.82	0.30	0.06	-0.40	0.12
Time spent on management duties	1577	0.11	1.00	0.78	0.27	-0.98	0.06	-0.48	0.12
Manager performance	1505	2.00	5.00	3.39	0.55	0.16	0.06	-0.62	0.13
Valid N (listwise)	1477								

Table 19: Descriptive Statistics 2014 all employees

Exceptional personal circumstances 2014 financial group (N=975)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N/A	866	88.8	88.8	88.8
	Partly	70	7.2	7.2	96.0
	Mostly	39	4.0	4.0	100.0
	Total	975	100.0	100.0	

Table 20: Exceptional personal circumstances 2014 financial group

Descriptive Statistics 2014 financial group (N=975)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Performance	966	1.00	5.00	3.18	0.73	0.13	0.08	0.73	0.16
Training	973	0.00	89.00	5.07	8.57	4.36	0.08	25.71	0.16
Tenure	975	3.00	43.17	14.75	9.14	0.58	0.08	-0.64	0.16
Commitment	975	38.00	91.00	51.86	10.64	0.93	0.08	0.52	0.16
Grade	975	1.00	4.00	2.44	0.80	0.20	0.08	-0.41	0.16
Time spent on management duties	975	0.11	1.00	0.74	0.28	-0.65	0.08	-1.06	0.16
Manager performance	957	2.00	5.00	3.41	0.57	0.09	0.08	-0.49	0.16
ARVE	975	0.00	1.04	0.78	0.28	-1.61	0.08	1.65	0.16
MARK-UP	975	-0.05	3.31	1.85	0.56	-1.67	0.08	3.97	0.16
Valid N (listwise)	946								

Table 21: Descriptive Statistics 2014 financial group

Grade frequencies 2014 (N=1,577)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Consultant	280	17.8	17.8	17.8
	Senior consultant	755	47.9	47.9	65.6
	Managing consultant	429	27.2	27.2	92.8
	Principal consultant	113	7.2	7.2	100.0
	Total	1577	100.0	100.0	

Table 22: Grade frequencies 2014

Grade frequencies 2014 " financial group" (N=975)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Consultant	95	9.7	9.7	9.7
	Senior consultant	450	46.2	46.2	55.9
	Managing consultant	334	34.3	34.3	90.2
	Principal consultant	96	9.8	9.8	100.0
	Total	975	100.0	100.0	

Table 23: Grade frequencies 2014 " financial group"

APPENDIX C: MODEL BUILDING; FITTING THE MODEL TO THE DATA AND CHECKING ASSUMPTIONS "ALL EMPLOYEES" MODEL

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
Repeated Effects	Time	3	Diagonal	3	PERS	1577
Total		4		4		

a. Dependent Variable: PERFORMANCE.

Table 24: Fixed intercept model dimensions

Information Criteria[a]

-2 Restricted Log Likelihood	9877.397
Akaike's Information Criterion (AIC)	9883.397
Hurvich and Tsai's Criterion (AICC)	9883.402
Bozdogan's Criterion (CAIC)	9905.764
Schwarz's Bayesian Criterion (BIC)	9902.764

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 25: Fixed intercept model information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
Random Effects	Intercept[b]	1	Variance Components	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	1577
Total		5		5		

a. Dependent Variable: PERFORMANCE.

Table 26: Random intercept model dimensions

Information Criteria[a]

-2 Restricted Log Likelihood	8617.879
Akaike's Information Criterion (AIC)	8625.879
Hurvich and Tsai's Criterion (AICC)	8625.887
Bozdogan's Criterion (CAIC)	8655.702
Schwarz's Bayesian Criterion (BIC)	8651.702

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 27: Random intercept model information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
Random Effects	Intercept[b]	1	Variance Components	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	1575
Total		6		6		

a. Dependent Variable: PERFORMANCE.

Table 28: Training fixed slope model dimensions

Information Criteria[a]

-2 Restricted Log Likelihood	8599.109
Akaike's Information Criterion (AIC)	8607.109
Hurvich and Tsai's Criterion (AICC)	8607.118
Bozdogan's Criterion (CAIC)	8636.926
Schwarz's Bayesian Criterion (BIC)	8632.926

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 29: Training fixed slope model information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
Random Effects	Intercept[b]	1	Variance Components	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	1575
Total		7		7		

a. Dependent Variable: PERFORMANCE.

Table 30: Tenure fixed slope model dimensions

Information Criteria[a]

-2 Restricted Log Likelihood	8242.455
Akaike's Information Criterion (AIC)	8250.455
Hurvich and Tsai's Criterion (AICC)	8250.463
Bozdogan's Criterion (CAIC)	8280.271
Schwarz's Bayesian Criterion (BIC)	8276.271

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 31: Tenure fixed slope information criteria

Model Dimension[a]

			Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept		1		1		
	TRAINING		1		1		
	TENURE		1		1		
Random Effects	Intercept	+	2	Unstructured	3	PERS	
	TENURE[b]						
Repeated Effects	Time		3	Diagonal	3	PERS	1575
Total			8		9		

a. Dependent Variable: PERFORMANCE.

Table 32: Tenure random slope model dimensions

Information Criteria[a]

-2 Log Likelihood	8197.254
Akaike's Information Criterion (AIC)	8215.254
Hurvich and Tsai's Criterion (AICC)	8215.292
Bozdogan's Criterion (CAIC)	8282.346
Schwarz's Bayesian Criterion (BIC)	8273.346

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 33: Tenure random slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
Random Effects	Intercept + TENURE[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	1575
Total		9		10		

a. Dependent Variable: PERFORMANCE.

Table 34: Commitment fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	8157.470
Akaike's Information Criterion (AIC)	8177.470
Hurvich and Tsai's Criterion (AICC)	8177.517
Bozdogan's Criterion (CAIC)	8252.017
Schwarz's Bayesian Criterion (BIC)	8242.017

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 35: Commitment fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
Random Effects	Intercept + TENURE + COMMITMENT[b]	3	Unstructured	6	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	1575
Total		10		13		

a. Dependent Variable: PERFORMANCE.

Table 36: Commitment random slope model dimensions

Information Criteria[a]

-2 Log Likelihood	8152.959
Akaike's Information Criterion (AIC)	8178.959
Hurvich and Tsai's Criterion (AICC)	8179.037
Bozdogan's Criterion (CAIC)	8275.870
Schwarz's Bayesian Criterion (BIC)	8262.870

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 37: Commitment random slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
Random Effects	Intercept + TENURE[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	1573
Total		10		11		

a. Dependent Variable: PERFORMANCE.

Table 38: Manager performance fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	7602.670
Akaike's Information Criterion (AIC)	7624.670
Hurvich and Tsai's Criterion (AICC)	7624.731
Bozdogan's Criterion (CAIC)	7705.809
Schwarz's Bayesian Criterion (BIC)	7694.809

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 39: Manager performance fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE	1		1		
Random Effects	Intercept + TENURE[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	1568
Total		11		12		

a. Dependent Variable: PERFORMANCE.

Table 40: Interaction variable time spent on management duties fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	7423.629
Akaike's Information Criterion (AIC)	7447.629
Hurvich and Tsai's Criterion (AICC)	7447.703
Bozdogan's Criterion (CAIC)	7535.815
Schwarz's Bayesian Criterion (BIC)	7523.815

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 41: Interaction variable fixed slope information criteria

Correlation Matrix for Estimates of Fixed Effects[a]

Parameter	Intercept	TRAINING	TENURE	COMMITMENT	MANAGER-PERFORMANCE	MANTIMEx PERFORMANCE
Intercept	1	-.146	-.425	-.609	-.735	.109
TRAINING	-.146	1	-.004	.010	.102	-.102
TENURE	-.425	-.004	1	.152	.046	-.047
COMMITMENT	-.609	.010	.152	1	.051	-.054
MANAGER-PERFORMANCE	-.735	.102	.046	.051	1	-.089
MANTIMEx PERFORMANCE	.109	-.102	-.047	-.054	-.089	1

a. Dependent Variable: PERFORMANCE.

Table 42: Correlation matrix

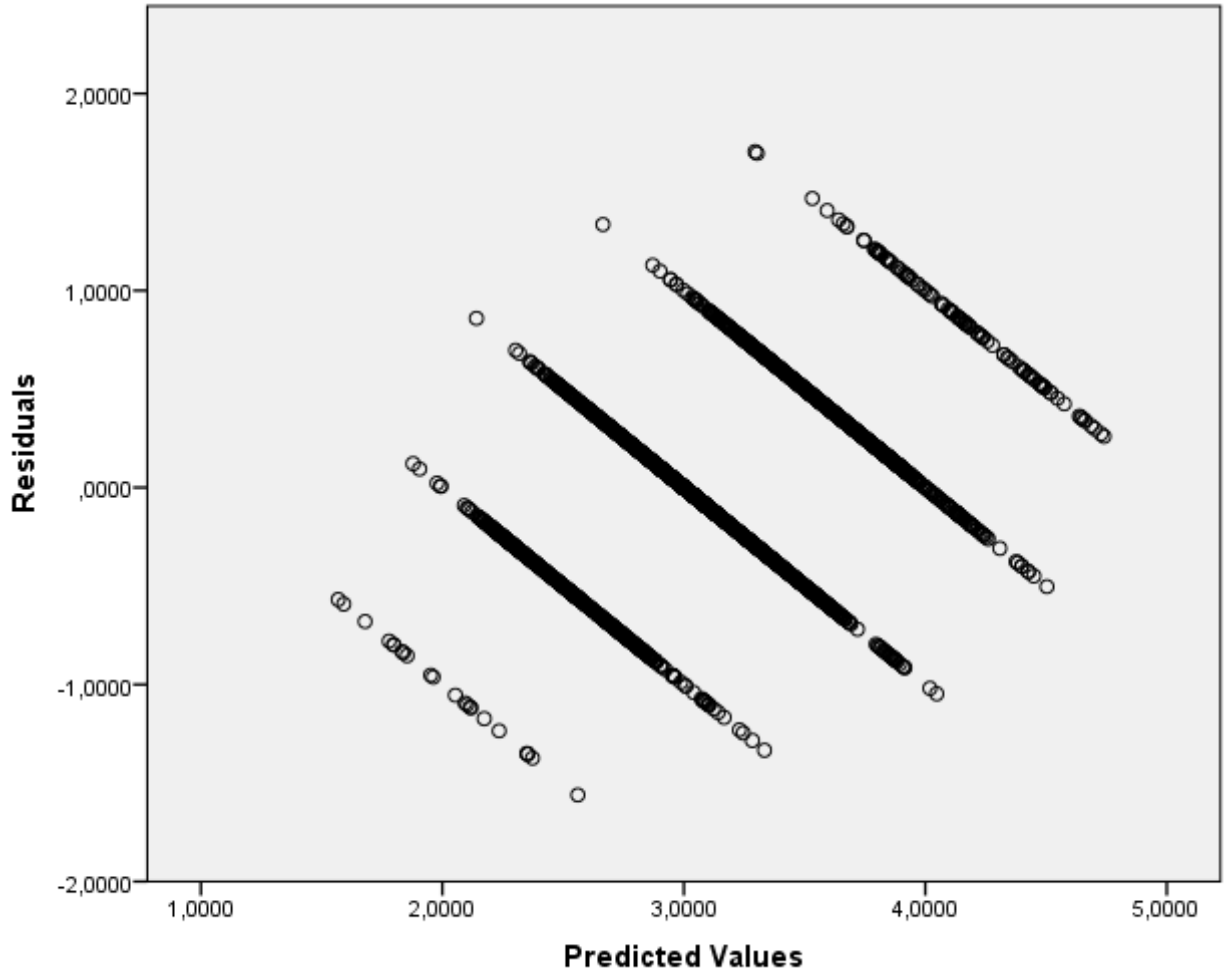

Figure 3:Scatterplot of predicted values and residuals

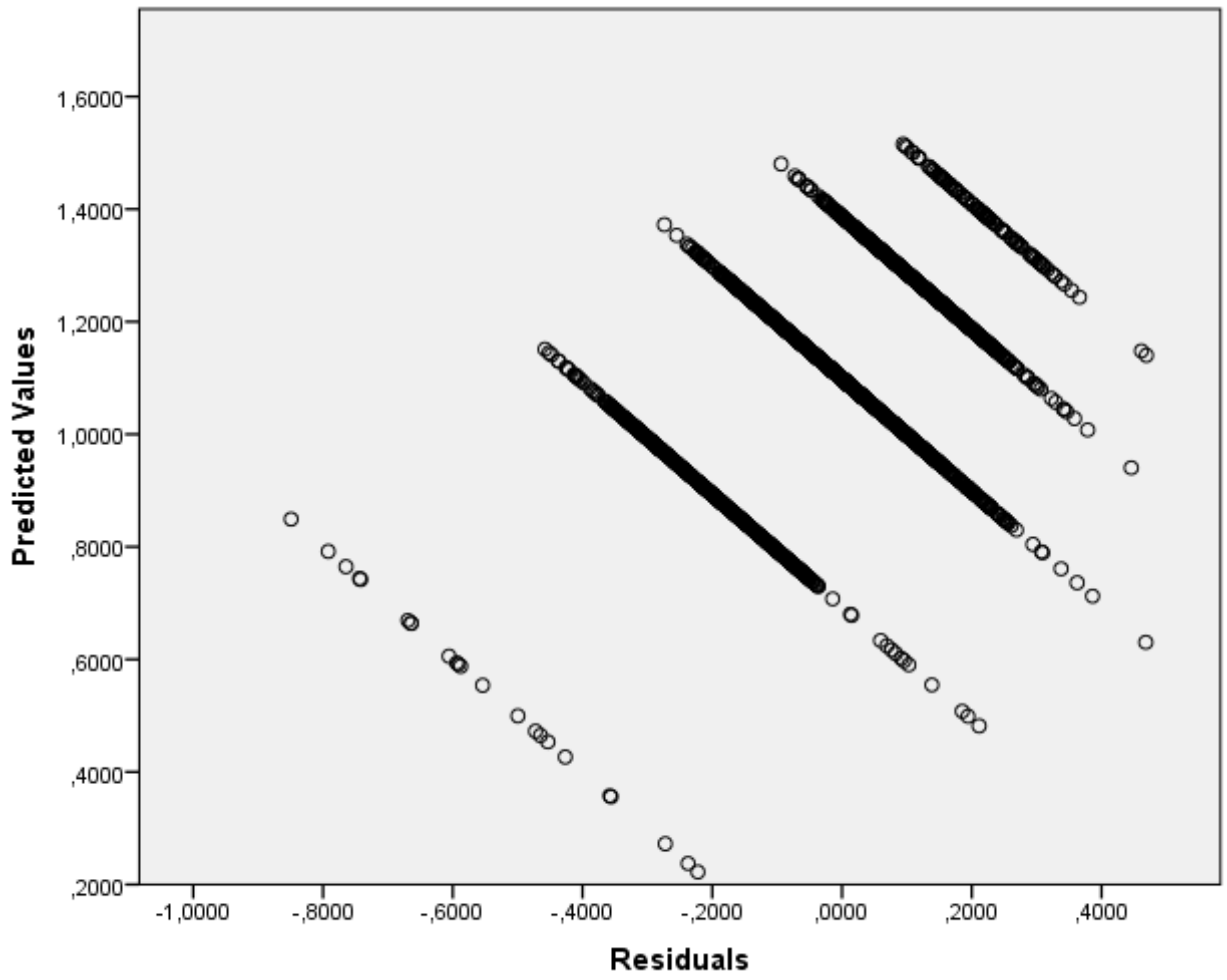

Figure 4:Scatterplot of predicted values and residuals with log transformed dependent variable

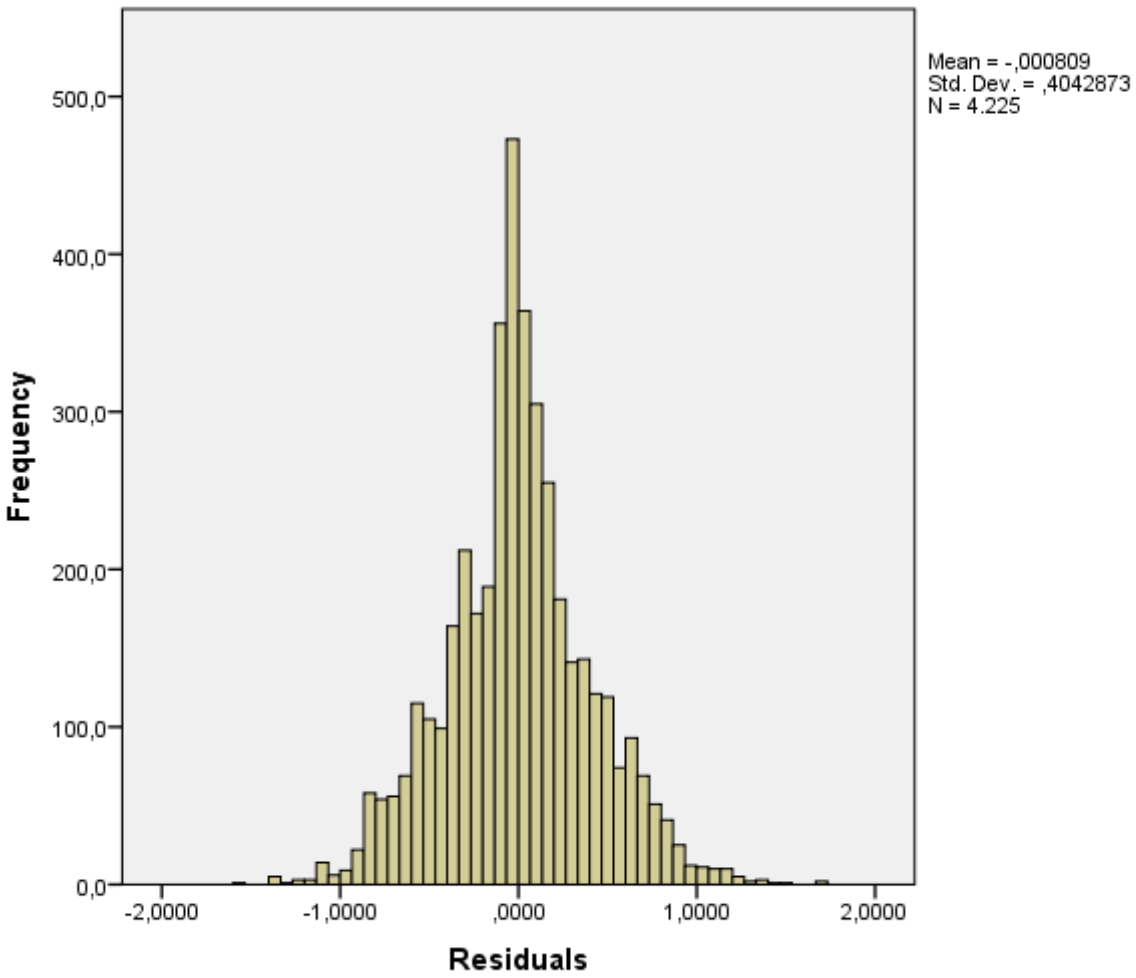

Figure 5: Histogram of distribution of residuals

Descriptive Statistics of residuals (N=4225)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Residuals	4225	-1.5608	1.7048	-.000809	.4042873	.086	.038	.558	.075
Valid N (listwise)	4225								

Table 43: Descriptive statistics of residuals

APPENDIX D: MODEL BUILDING; FITTING THE MODEL TO THE DATA AND CHECKING ASSUMPTIONS FINANCIAL GROUP MODEL

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
Repeated Effects	Time	3	Diagonal	3	PERS	998
Total		4		4		

a. Dependent Variable: PERFORMANCE.

Table 44: Fixed intercept model dimensions

Information Criteria[a]

-2 Restricted Log Likelihood	6226.201
Akaike's Information Criterion (AIC)	6232.201
Hurvich and Tsai's Criterion (AICC)	6232.209
Bozdogan's Criterion (CAIC)	6253.150
Schwarz's Bayesian Criterion (BIC)	6250.150

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 45: Fixed intercept indormation criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
Random Effects	Intercept[b]	1	Variance Components	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	998
Total		5		5		

a. Dependent Variable: PERFORMANCE.

Table 46: Random intercept model dimensions

Information Criteria[a]

-2 Log Likelihood	5572.496
Akaike's Information Criterion (AIC)	5582.496
Hurvich and Tsai's Criterion (AICC)	5582.516
Bozdogan's Criterion (CAIC)	5617.413
Schwarz's Bayesian Criterion (BIC)	5612.413

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 47: Random intercept information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
Random Effects	Intercept	1	Identity	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	996
Total		6		6		

a. Dependent Variable: PERFORMANCE.

Table 48: Training fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	5572.496
Akaike's Information Criterion (AIC)	5582.496
Hurvich and Tsai's Criterion (AICC)	5582.516
Bozdogan's Criterion (CAIC)	5617.413
Schwarz's Bayesian Criterion (BIC)	5612.413

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 49:Ttraining fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
Random Effects	Intercept	1	Identity	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	996
Total		7		7		

a. Dependent Variable: PERFORMANCE.

Table 50: Tenure fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	5327.401
Akaike's Information Criterion (AIC)	5341.401
Hurvich and Tsai's Criterion (AICC)	5341.439
Bozdogan's Criterion (CAIC)	5390.271
Schwarz's Bayesian Criterion (BIC)	5383.271

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 51: Tenure fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
Random Effects	Intercept + TENURE[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	996
Total		8		9		

a. Dependent Variable: PERFORMANCE.

Table 52: Tenure random slope model dimensions

Information Criteria[a]

-2 Log Likelihood	5312.698
Akaike's Information Criterion (AIC)	5330.698
Hurvich and Tsai's Criterion (AICC)	5330.760
Bozdogan's Criterion (CAIC)	5393.531
Schwarz's Bayesian Criterion (BIC)	5384.531

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 53: Tenure random slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
Random Effects	Intercept + TENURE[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	996
Total		9		10		

a. Dependent Variable: PERFORMANCE.

Table 54: Commitment fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	5294.154
Akaike's Information Criterion (AIC)	5314.154
Hurvich and Tsai's Criterion (AICC)	5314.229
Bozdogan's Criterion (CAIC)	5383.968
Schwarz's Bayesian Criterion (BIC)	5373.968

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 55: Commitment fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
Random Effects	Intercept	1	Identity	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		9		9		

a. Dependent Variable: PERFORMANCE.

Table 56: Manager performance fixed slope model dimensions after removing tenure as random

Information Criteria[a]

-2 Log Likelihood	4908.896
Akaike's Information Criterion (AIC)	4926.896
Hurvich and Tsai's Criterion (AICC)	4926.963
Bozdogan's Criterion (CAIC)	4988.945
Schwarz's Bayesian Criterion (BIC)	4979.945

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 57: Manager performance fixed slope information criteria after removing tenure as random

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE financial	1		1		
Random Effects	Intercept	1	Identity	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		10		10		

a. Dependent Variable: PERFORMANCE.

Table 58: Manager time interaction fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4890.412
Akaike's Information Criterion (AIC)	4910.412
Hurvich and Tsai's Criterion (AICC)	4910.495
Bozdogan's Criterion (CAIC)	4979.322
Schwarz's Bayesian Criterion (BIC)	4969.322

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 59: Manager time interaction fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE financial	1		1		
Random Effects	Intercept + MANTIMEx PERFORMANCE financial [b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		11		12		

a. Dependent Variable: PERFORMANCE.

Table 60:Manager time interaction random slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4890.126
Akaike's Information Criterion (AIC)	4914.126
Hurvich and Tsai's Criterion (AICC)	4914.243
Bozdogan's Criterion (CAIC)	4996.817
Schwarz's Bayesian Criterion (BIC)	4984.817

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 61: Manager time interaction random slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE MANTIMEx	1		1		
	PERFORMANCE financial	1		1		
	ARVEcen	1		1		
Random Effects	Intercept	1	Identity	1	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		11		11		

a. Dependent Variable: PERFORMANCE.

Table 62: ARVE fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4761.885
Akaike's Information Criterion (AIC)	4783.885
Hurvich and Tsai's Criterion (AICC)	4783.985
Bozdogan's Criterion (CAIC)	4859.686
Schwarz's Bayesian Criterion (BIC)	4848.686

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 63: ARVE fixed slope model information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE MANTIMEx PERFORMANCE financial	1		1		
	ARVEcen	1		1		
Random Effects	Intercept + ARVEcen[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		12		13		

a. Dependent Variable: PERFORMANCE.

Table 64: ARVE random slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4729.416
Akaike's Information Criterion (AIC)	4755.416
Hurvich and Tsai's Criterion (AICC)	4755.553
Bozdogan's Criterion (CAIC)	4844.999
Schwarz's Bayesian Criterion (BIC)	4831.999

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 65: ARVE random slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE financial	1		1		
	ARVEcen	1		1		
	ARVExPartly	1		1		
Random Effects	Intercept + ARVEcen[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		13		14		

a. Dependent Variable: PERFORMANCE.

Table 66: ARVE interaction partly fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4729.290
Akaike's Information Criterion (AIC)	4757.290
Hurvich and Tsai's Criterion (AICC)	4757.448
Bozdogan's Criterion (CAIC)	4853.763
Schwarz's Bayesian Criterion (BIC)	4839.763

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 67: ARVE interaction partly fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE financial	1		1		
	ARVEcen	1		1		
	ARVExPartly	1		1		
	ARVExmostly	1		1		
Random Effects	Intercept + ARVEcen[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		14		15		

a. Dependent Variable: PERFORMANCE.

Table 68: ARVE interaction mostly fixed slope model

Information Criteria[a]

-2 Log Likelihood	4719.558
Akaike's Information Criterion (AIC)	4749.558
Hurvich and Tsai's Criterion (AICC)	4749.739
Bozdogan's Criterion (CAIC)	4852.922
Schwarz's Bayesian Criterion (BIC)	4837.922

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 69: ARVE interaction mostly fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE financial	1		1		
	ARVEcen	1		1		
	ARVExPartly	1		1		
	ARVExmostly	1		1		
	MARKUPcen	1		1		
Random Effects	Intercept + ARVEcen[b]	2	Unstructured	3	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		15		16		

a. Dependent Variable: PERFORMANCE.

Table 70: MARK-UP fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4686.321
Akaike's Information Criterion (AIC)	4718.321
Hurvich and Tsai's Criterion (AICC)	4718.526
Bozdogan's Criterion (CAIC)	4828.577
Schwarz's Bayesian Criterion (BIC)	4812.577

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 71: MARK-UP fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE financial	1		1		
	ARVEcen	1		1		
	ARVExPartly	1		1		
	ARVExmostly	1		1		
	MARKUPcen	1		1		
Random Effects	Intercept + ARVEcen + MARKUPcen[b]	3	Unstructured	6	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		16		19		

a. Dependent Variable: PERFORMANCE.

Table 72: MARK-UP random slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4665.438
Akaike's Information Criterion (AIC)	4703.438
Hurvich and Tsai's Criterion (AICC)	4703.724
Bozdogan's Criterion (CAIC)	4834.366
Schwarz's Bayesian Criterion (BIC)	4815.366

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 73: MARK-UP random slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE financial	1		1		
	ARVEcen	1		1		
	ARVExPartly	1		1		
	ARVExmostly	1		1		
	MARKUPcen	1		1		
	MARKUPxPartly	1		1		
Random Effects	Intercept + ARVEcen + MARKUPcen[b]	3	Unstructured	6	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		17		20		

a. Dependent Variable: PERFORMANCE.

Table 74: MARK-UP interaction partly fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4660.405
Akaike's Information Criterion (AIC)	4700.405
Hurvich and Tsai's Criterion (AICC)	4700.722
Bozdogan's Criterion (CAIC)	4838.224
Schwarz's Bayesian Criterion (BIC)	4818.224

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 75: MARK-UP interaction partly fixed slope information criteria

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables	Number of Subjects
Fixed Effects	Intercept	1		1		
	TRAINING	1		1		
	TENURE	1		1		
	COMMITMENT	1		1		
	MANAGER-PERFORMANCE	1		1		
	MANTIMEx PERFORMANCE financial	1		1		
	ARVEcen	1		1		
	ARVExPartly	1		1		
	ARVExmostly	1		1		
	MARKUPcen	1		1		
	MARKUPxPartly	1		1		
	MARKUPxMostly	1		1		
Random Effects	Intercept + ARVEcen + MARKUPcen[b]	3	Unstructured	6	PERS	
Repeated Effects	Time	3	Diagonal	3	PERS	994
Total		18		21		

a. Dependent Variable: PERFORMANCE.

Table 76: MARK-UP interaction mostly fixed slope model dimensions

Information Criteria[a]

-2 Log Likelihood	4660.069
Akaike's Information Criterion (AIC)	4702.069
Hurvich and Tsai's Criterion (AICC)	4702.417
Bozdogan's Criterion (CAIC)	4846.779
Schwarz's Bayesian Criterion (BIC)	4825.779

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: PERFORMANCE.

Table 77: MARK-UP interaction mostly fixed slope information criteria

Correlation Matrix for Estimates of Fixed Effects[a]

Parameter	Intercept	TRAINING	TENURE	COMMITMENT	MANAGERPERFORMANCE	MANTIMExPERFORMANCEfinnancial	ARVEcen	ARVExPartly	ARVExmostly	MARKUPcen	MARKUPxPartly	MARKUPxMostly
Intercept	1	-.125	-.369	-.665	-.708	.047	-.046	.004	.011	-.048	.014	-.001
TRAINING	-.125	1	.017	-.015	.094	-.048	.091	.035	-.012	-.026	-.017	.015
TENURE	-.369	.017	1	.179	.010	-.009	-.068	.013	.026	.213	-.007	-.028
COMMITMENT	-.665	-.015	.179	1	.044	-.027	.054	.015	.017	.003	.022	-.010
MANAGERPERFORMANCE	-.708	.094	.010	.044	1	-.042	-.013	-.012	-.019	-.017	-.033	.017
MANTIMExPERFORMANCEfinnancial	.047	-.048	-.009	-.027	-.042	1	-.063	.027	.038	.059	-.010	-.007
ARVEcen	-.046	.091	-.068	.054	-.013	-.063	1	-.263	-.262	-.259	.085	.082
ARVExPartly	.004	.035	.013	.015	-.012	.027	-.263	1	.106	.055	-.213	.002
ARVExmostly	.011	-.012	.026	.017	-.019	.038	-.262	.106	1	.079	-.013	-.498
MARKUPcen	-.048	-.026	.213	.003	-.017	.059	-.259	.055	.079	1	-.225	-.193
MARKUPxPartly	.014	-.017	-.007	.022	-.033	-.010	.085	-.213	-.013	-.225	1	.071
MARKUPxMostly	-.001	.015	-.028	-.010	.017	-.007	.082	.002	-.498	-.193	.071	1

a. Dependent Variable: PERFORMANCE.

Table 78: correlation matrix financial group

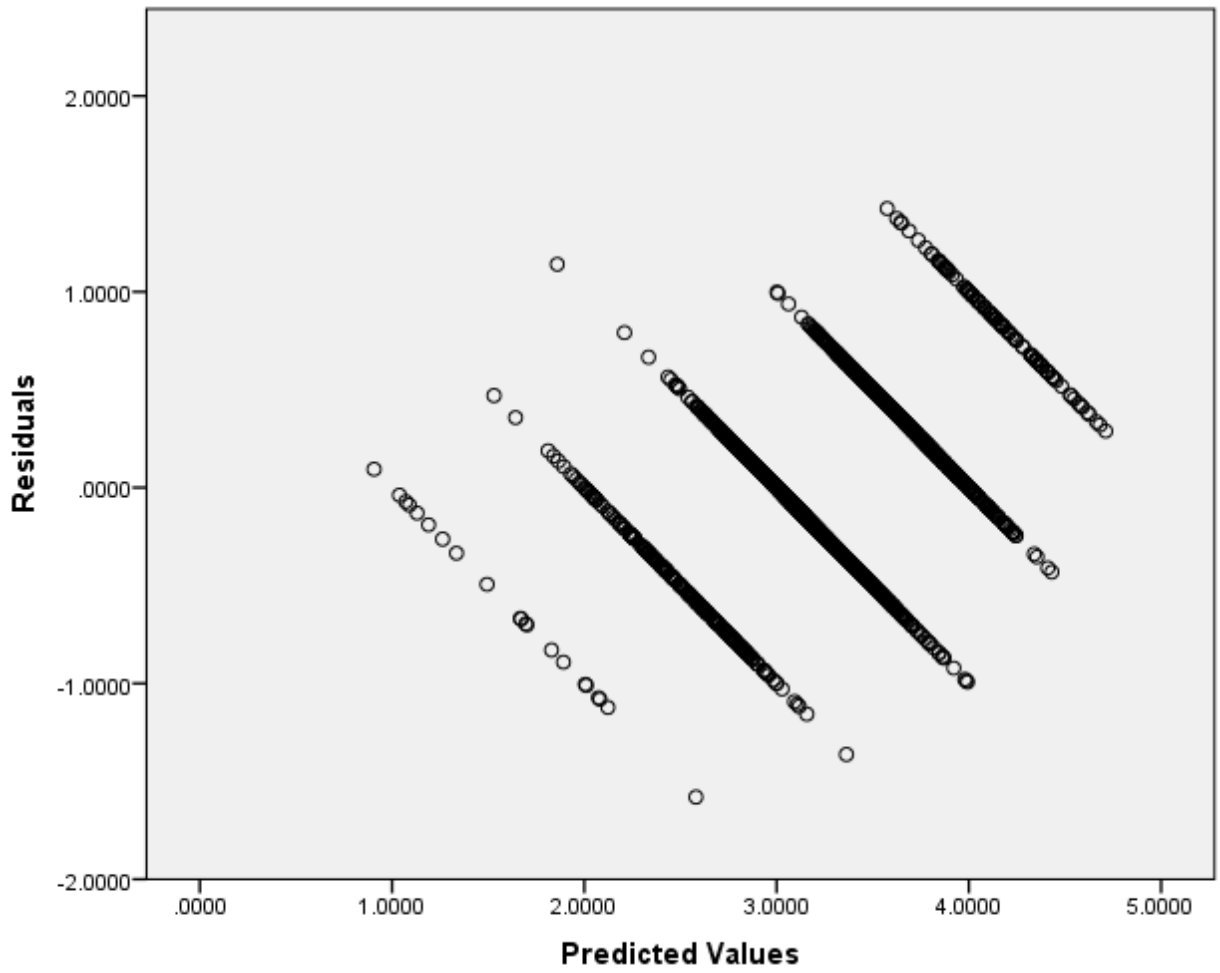

Figure 6: Scatterplot of predicted values and residuals

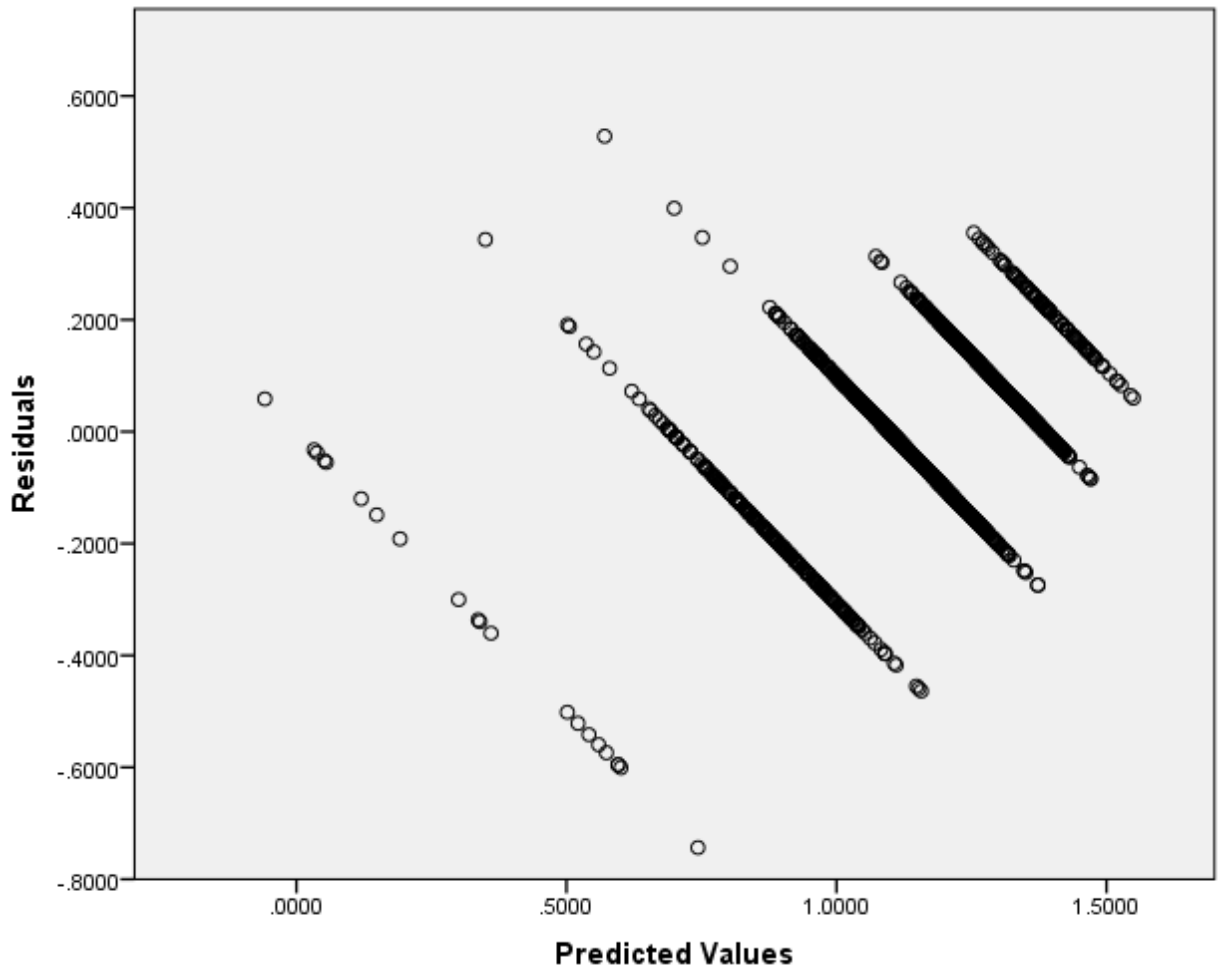

Figure 7: Figure 4:Scatterplot of predicted values and residuals with log transformed dependent variable

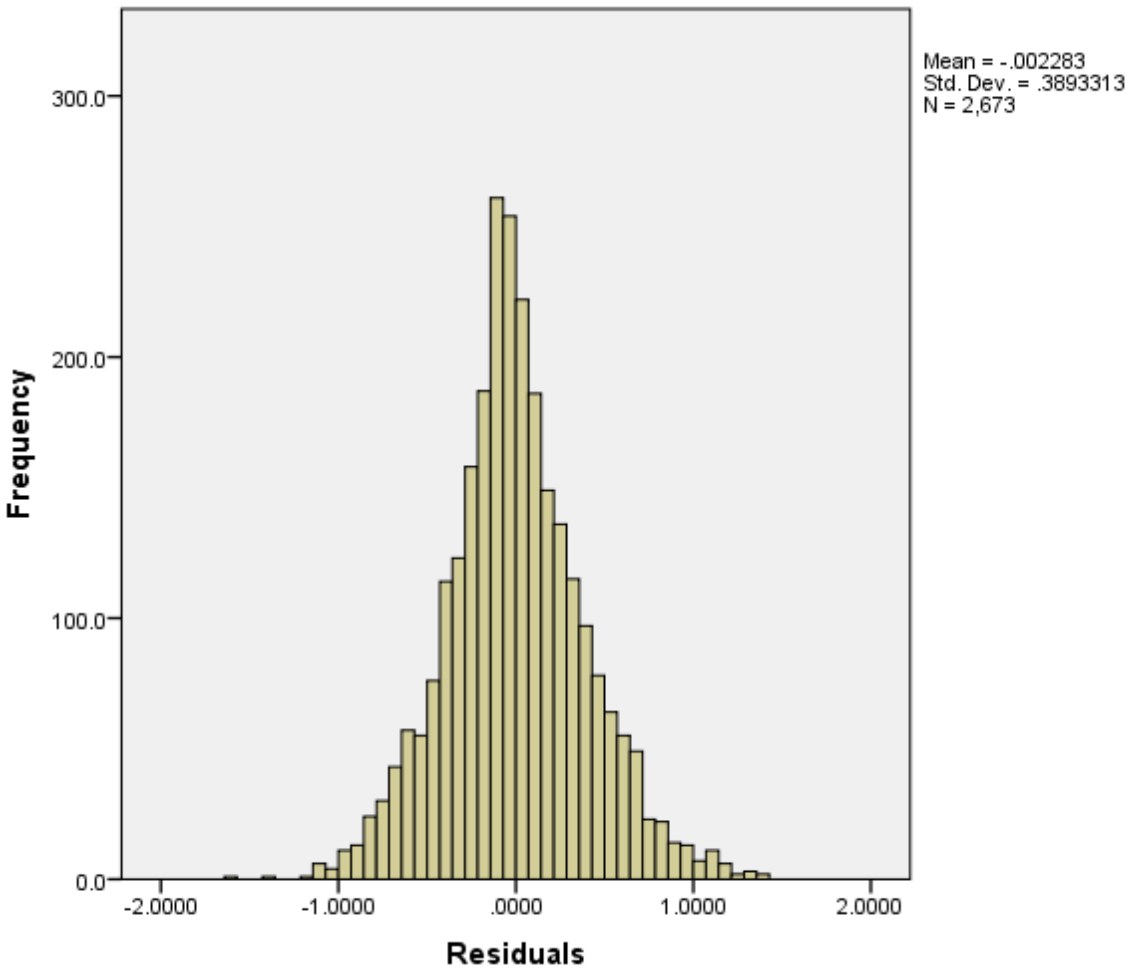

Figure 8: Histogram of distribution of residuals

Descriptive Statistics of residuals (N=2673)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Residuals	2673	-1.5805	1.4252	-.002283	.3893313	.191	.047	.568	.095
Valid N (listwise)	2673								

Table 79: Descriptive statistics of residuals