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# Employee turnover rate and organizational performance in South Africa


## Abstract

Within the business community, employee turnover is widely assumed to affect organizational performance. Different variations of this relationship have been proposed over the years. This study seeks to confirm if a curvilinear relationship exists between employee turnover rates and organizational performance that could inform an optimal employee turnover rate for organizations in South Africa. To this purpose, a cross-sectional study that collected quantitative data through the use of a self-administered questionnaire was employed. Through multiple linear and non-linear regression, the results indicate that voluntary employee turnover rate significantly predicted financial and organizational performance through a cubic function. The optimal functional voluntary employee turnover rate for organizations in South Africa was calculated to be between 14 and 19%.


**Keywords:** employee turnover rate, voluntary turnover, organizational performance, curvilinear, optimal.
**JEL Classification:** M12, M54.

## Introduction

Given that employees form part of the valuable resources that inform, shape and give effect to strategy, it follows on that any shift in human resources plays a role on organizational performance (Harris, Tang & Tseng, 2002). Therefore, the notion that employee turnover affects an organization is widely entrenched amongst managers (Allen, Bryant & Vardaman, 2010). Its management remains a challenging issue in organizational strategy (Harris et al., 2002).

Employee turnover has been extensively researched for many years by academics, consultants, psychologists and human resource practitioners (Allen et al., 2010; Abelson & Baysinger, 1984; Cotton & Tuttle, 1986; Park & Shaw, 2013; Szilagyi, 1979; Zeffane, 1994). It is a dynamic omnipresent process in organizations (Dalton & Todor, 1982) and the antecedents of employee turnover and factors driving the intent-to-stay decisions have been extensively studied (Shukla & Sinha, 2013; Abelson & Baysinger, 1984). Given the shift toward a knowledge-based economy, the extent to which changes in organizational performance are attributed to employee turnover rate is the subject of increasing interest (Hausknecht & Trevor, 2011). Most studies on the subject have been tested out in the United States (Sturman, Shao & Katz, 2012). The mixed results prevent consensus on the subject (Hancock, Bosco, McDaniel & Pierce, 2013).

In order to contribute to this body of research, the purpose of this study was to explore the relationship between employee turnover rate and organizational performance, and determine whether the phenomenon of an optimal employee turnover rate exists for organizations in South Africa.


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The first part of the article reviews the literature on employee turnover and existing turnover models. This is followed by the methodology, and the presentation and discussion of the empirical results.

## 1. Literature review

**1.1. Significance of the study.** According to Holtom, Mitchell, Lee and Eberly (2008) there is a need to investigate the impact of employee turnover at an organizational level. The purpose of the study is to equip managers to differentiate between problematically 'high' employee turnover rates and optimally 'high' employee turnover rates (Abelson & Baysinger, 1984). It aimed to make employee turnover rate an independent variable as opposed to a dependent variable.

**1.2. Types of turnover.** Voluntary employee turnover rate occurs when an employee willingly leaves the organization. Involuntary employee turnover rate occurs when the employer terminates the employment contract. Shaw et al. (1998) emphasize the necessity to distinguish between voluntary and involuntary turnover as the causes, consequences and control of these turnover decisions differ. Conversely, Batt and Colvin (2011) argue that the effects of this turnover are similar. In addition, functional employee turnover derives from the termination due to a replaceable or unsatisfactory employee performance, whilst dysfunctional employee turnover results from the departure of unique skills workers or performers (Abelson & Baysinger, 1984).

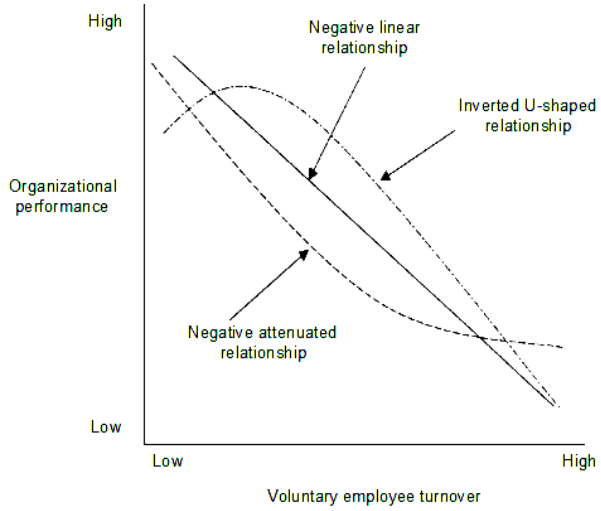
**1.3. Consequences of employee turnover.** Turnover brings dysfunction to the organization (Park, Ofori-Dankworth & Bishop, 1994) by interrupting operational processes and placing undue responsibilities on remaining members. According to the human capital perspective, aggregate employee turnover reduces firm-specific human capital, and therefore affects the production process. Stock of

knowledge, skills and organizational memory are lost (Dess & Shaw, 2001).

Allen et al. (2010) identified associated exit management costs such as training, advertising, due benefits or wages. Additionally, turnover impacts the development of the organization social capital (Leana & Van Buren, 1999). Output levels, quality, consistency and customer service are affected, leading to a loss in productivity that can be up to 70% of the total turnover costs incurred (Tracey & Hinkin, 2008). Huselid (1995) and Glebbeek and Bax (2004) found negative associations, ranging from -.18 to -.24, between employee turnover rates and organizational performance.

However, functional employee turnover may yield organizational performance benefits (Staw, 1980). Organizations benefit from poor performers turnover when replacement costs are low and average performance of replacements is high (Gerhart, Boudreau & Trevor, 1995). Koslowksy and Locke (1989) contend that new entrants to the organization give rise to socialization through relationships and network. Similarly, employee homogeneity is disrupted by turnover (Schneider, Goldstein and Smith, 1995). Dess and Shaw (2001) assert that low employee turnover rates create inertia and "trained capacity". Therefore, employee turnover provides opportunities to bring new ideas, innovation and paradigms to the organization with commensurate enhanced organizational performance (Abelson & Baysinger, 1984).

**1.4. Employee turnover models.** Three different types of models have been debated about the form of the turnover-performance relationship: (1) a linear negative relationship, (2) an attenuated negative relationship, and (3) an inverted-U-shaped relationship (Figure 1).




Source: Shaw, Gupta and Delery (2005).

**Fig. 1. Relationships between voluntary turnover and organizational performance**

The linear negative relationship derives mainly from the human capital theory (Strober, 1990), and is also supported by an economics-based perspective (Shaw, 2011). Voluntary employee turnover incurs losses in productivity (Dess & Shaw, 2001). Additional literature advocates that employee turnover rate is linearly and negatively related to organizational performance (Salamin & Hom, 2005; Park & Shaw, 2013; Shaw et al., 2005). Separation, replacement costs, human capital and social capital losses of turnover cancel out the functional effects of turnover (Hancock et al., 2013)

Other research suggests that the relationship between employee turnover rate and organizational performance might be curvilinear (Shaw et al., 2005; Trevor, Gerhart, & Boudreau, 1997; Jackofsky, Ferris & Breckenridge, 1986; Hancock et al., 2013). The model implies that beyond a point, small increments in employee turnover rate have a reduced impact on the organizational performance. At low employee turnover rates, it takes time for individuals as well as organizational investment to build firm-specific human capital (Park & Shaw, 2013). New entrants to the organization are able to match previous performance levels quicker and the impact on organizational performance is attenuated. With employee turnover at high levels, the organization may have evolved and systems in place to deal with this phenomenon, despite the low levels of firm-specific human capital (Shaw, 2011). Studies involving accident rates, productivity and customer service quality (Hausknecht & Trevor, 2011; Shaw et al., 2005) have evidenced the attenuated negative relationship.

Dalton and Todor (1982) criticized the models for being too one-dimensional. According to Abelson and Baysinger (1984), since employee turnover is

costly to reduce, the optimal level of employee turnover must be greater than zero. The costs and benefits of employee turnover need to be examined in order to determine an optimal range. Baysinger and Mobley (1983) contend that the total turnover cost is the aggregation of the retention costs and the turnover costs resulting in inverted-U relationship shape. The model implies that turnover affects more likely both low and high performers rather than average performers (Sturman et al., 2012).

It was strongly supported by studies of Siebert & Zubanov (2009). Baysinger and Mobley (1983) add that the inflection point would shift based on the unique circumstances of each organization.

## 2. Research methodology

**2.1. Research design.** Using a deductive research process (Creswell, 2003), the research design took the form of a cross-sectional study that collected quantitative data through the use of a self-administered web-based questionnaire. Data collection took place within the same time period, negating any time-related variances that may influence a respondent (Bryman, 2012).

**2.2. Population, sample and sampling method.** Two non-probability sampling methods were employed: (1) convenience sampling and (2) snowball sampling (Creswell, 2003). Convenience sampling was employed to gain access to a large sampling frame through the use of the South African Board for People Practices' (SABPP) database. The SABPP aims to establish a data repository with benchmark or reference values that could assist with human resource management practices. Snowball sampling aided to extend the reach of the questionnaire through the use of professional networks and social media.

The respondents comprised mostly of people within the human resource function across all levels within their respective organizations. The broader population was defined as all non-profit and for-profit companies in South Africa.

In total, 164 responses were collected, yet only 83 respondents provided returns with an acceptably small amount of missing data. The missing data points were replaced through the use of imputation techniques. The 83 respondents originated from various sectors within the South African economy and were reclassified into industrial (36%) and services (64%) sectors.

**2.4. Employee turnover rate.** The employee turnover rate is synonymous with employee separation rate (Price, 1989). The following calculation methods were utilized (expressed as percentages):

- Total employee turnover rate – Number of employees that have left the organization during a period divided by the average number of employees in service during that period.
- Voluntary employee turnover rate – Total employee turnover rate multiplied by the proportion of voluntary turnover.
- Involuntary employee turnover rate – Total employee turnover rate multiplied by the proportion of involuntary turnover.

**2.5. The research instrument.** The research instrument was compiled with reference to the literature, but more specifically from the working paper by Harris et al. (2002), and the meta-analysis conducted by Park and Shaw (2013). As a number of varying methods exist for expressing employee turnover rates, raw data were used to ensure comparative turnover rates that could be computed.

**2.6. Turnover rates data.** Respondents were requested to provide ratio data on employee turnover: proportion of voluntary and involuntary turnover (Dess, Lumpkin, Eisner & McNamara, 2011) and percentage of dysfunctional turnover. The latter was important to ascertain what proportion of employee is advantageous to the organization. A combination of direct numerical data and slider scales were used.

**2.7. Performance data.** The study made of use of proxies as broad organizational performance measures to ensure a common reference. Respondents were requested to rate operational, financial performance, innovation and employee engagement relative to the competitors. The measures were collected though the use of slider scales. If it was a revenue generating entity, additional questions were asked to obtain data for the distal financial measures (Park & Shaw, 2013) and the proximal measure i.e. sales and RONA.

**2.8. Data analysis and interpretation.** Various mathematical and statistical analysis techniques were employed to conduct univariate, bivariate and mutivariate analysis. The univariate analysis included frequency tables for the categorical data, measures of central tendency and dispersion for the ratio/interval data (Bryman, 2012). Bivariate analysis made use of the Pearson's correlation to determine the association between employee turnover rates and performance (Lane et al., 2011). Multiple regression was used to determine the relationship (linear or non-linear) between turnover rate and organizational performance, the number of significant variables, and the size and significance of the slope parameters of the variables.

Multiple linear and non-linear regression was used to identify the best model and significant independent variables that predicted the dependent variable.

Further analysis was undertaken to test the validity of the models and data characteristics assumptions and include model structure, multicollinearity, residual patterns, normality of residuals as well as the effect of outliers. The backward elimination heuristic method was employed to remove variables from the model with *p*-values that exceeded an $\alpha$ cut-off value of .10. The best model was based on considering the coefficient of determination and various information criteria. The model selection was based on the highest adjusted coefficient of determination (Adj $R^2$), accounting for the intercept and number of independent variables as well as Akaike's Information Criteria (AIC), Sawa Bayesian Information Criteria (BIC), Schwarz Bayesian Criteria (SBC) and Amemiya Prediction Criteria (PC) as measures of goodness of fit.

Analysis of variance (ANOVA) and *t*-tests were used to compare the means of the industry groups, organization size, age and orientation to discern any significant turnover rate differences between these subgroups.

**2.9. Limitations, validity and reliability of the study.** The use of convenience sampling to gain access to a large sampling frame, although supported by snowball sampling, may have affected overall generalizability. The overall size of the dataset limited the types of statistical analyses possible, including the use of control variables related to various subgroups.

Additionally, very few empirical studies have been conducted that cut across all industry sectors in South Africa, limiting the validation of the study outcome.

## 3. Presentation of results and discussion

**3.1. Demographic descriptive statistics.** The demographic descriptive statistics are summarized in Table 1. Only 33 of the 57 revenue generating respondents provided sales (distal) data that were used to calculate the proximal performance measure productivity. As a small number of respondents provided RONA data as a distal performance measure, these variables were used with caution in the subsequent statistical analysis.

Table 1. Summary of the demographic descriptive statistics

| Variable | Counts | | Centrality | | Spread | | | |
|---|---|---|---|---|---|---|---|---|
| | N | % | Mean | Median | SD | IQR | Min | Max |
| Level | | | - | - | - | - | - | - |
| Organization | 29 | 35% | - | - | - | - | - | - |
| Business unit | 54 | 65% | - | - | - | - | - | - |
| Broad categorization | | | - | - | - | - | - | - |
| Industrial | 30 | 36% | - | - | - | - | - | - |
| Services | 53 | 64% | - | - | - | - | - | - |
| Operating model | | | - | - | - | - | - | - |
| Cost recovery | 26 | 31% | - | - | - | - | - | - |
| Revenue generating | 57 | 69% | - | - | - | - | - | - |
| Orientation | | | - | - | - | - | - | - |
| Product and service | 17 | 20% | - | - | - | - | - | - |
| Product | 17 | 20% | - | - | - | - | - | - |
| Service | 49 | 59% | - | - | - | - | - | - |
| Organization age | | | - | - | - | - | - | - |
| < 10 years | 24 | 29% | - | - | - | - | - | - |
| 10-20 years | 14 | 17% | - | - | - | - | - | - |
| > 20 years | 45 | 54% | - | - | - | - | - | - |
| Majority union | | | - | - | - | - | - | - |
| No | 60 | 72% | - | - | - | - | - | - |
| Yes | 23 | 28% | - | - | - | - | - | - |
| Economic environment | 83 | 100% | 37.91 | 38.30 | 20.68 | 26.00 | 2.00 | 100.00 |
| Employee age | 83 | 100% | 37.37 | 37.37 | 5.44 | 5.00 | 27.00 | 55.00 |
| Turnover | 83 | 100% | | | | | | |
| Total turnover rate | 83 | 100% | 21.56 | 14.29 | 25.23 | 23.92 | 0.00 | 155.56 |
| Proportion voluntary turnover | 83 | 100% | 53.75 | 53.71 | 30.24 | 56.00 | 0.00 | 100.00 |
| Proportion dysfunctional turnover | 83 | 100% | 58.10 | 60.00 | 31.22 | 52.00 | 0.00 | 100.00 |
| Organizational performance | 83 | 100% | | | | | | |
| Operational performance | 83 | 100% | 61.25 | 61.36 | 17.90 | 25.00 | 10.00 | 100.00 |
| Financial performance | 83 | 100% | 57.50 | 60.00 | 20.68 | 23.00 | 9.00 | 100.00 |
| Innovation | 83 | 100% | 59.68 | 60.05 | 26.08 | 36.00 | 0.00 | 100.00 |
| Employee engagement | 83 | 100% | 48.55 | 49.00 | 24.53 | 35.00 | 2.00 | 100.00 |

Table 1 (cont.). Summary of the demographic descriptive statistics

| Variable | Counts | | Centrality | | Spread | | | |
|---|---|---|---|---|---|---|---|---|
| | N | % | Mean | Median | SD | IQR | Min | Max |
| Sales ('000 000) | 33 | 58% | 5436.80 | 320.00 | 15194.08 | 980.00 | 0.05 | 65000.00 |
| Productivity ('000) | 33 | 58% | 6019.44 | 3250.00 | 9250.85 | 5555.56 | 1.67 | 41666.67 |
| RONA | 21 | 37% | 26.35 | 18.00 | 21.14 | 27.00 | 3.00 | 85.00 |

**3.2. Association between employee turnover rate and organizational performance.** The commonly held interpretations from Lee (2014) served as a reference to establish a correlation between the study variables. Establishing an organizational performance variable for the study. After an internal reliability assessment, the variables were found to be significantly and positively correlated (correlation 0.50-0.80) to moderately and positively correlated (0.30-.49) (Table 2).

Table 2. Internal reliability assessment for broad operational performance measures

| Cronbach Coefficient Alpha | |
|---|---|
| Variables | Alpha |
| Raw | 0.78 |
| Standardized | 0.79 |

| | Variable | Mean | SD | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|
| 1 | Operation performance | 61.25 | 17.90 | | | | |
| 2 | Financial performance | 57.50 | 20.68 | .48*** | | | |
| 3 | Innovation | 59.68 | 26.08 | .58*** | .32*** | | |
| 4 | Employee engagement | 48.55 | 24.53 | .56*** | .47*** | .52*** | |

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$.

The internal reliability (Cronbach Alpha) of the variables is reflected as 0.79 (standardized) and allowed to reduce the variables to a new aggregated variable organizational performance.

♦ Testing the correlation of study variables

A correlation analysis was conducted between the respective variables, taking cognisance of the new aggregated variable for the study, organizational performance (Tables 3 and 4). It can be summarized that the broad organizational performance measures, viz. organizational, operational and financial performance, show small to moderate negative correlations with voluntary turnover rate. Operational and financial performance show small to moderate negative correlations with total employee turnover rate.

The results do not provide support for any significant association between distal and proximal measures such as organization's sales, productivity, or RONA and employee turnover rates.

Table 3. Means, standard deviations and correlations of study variables – broad performance measures

| | Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Proportion voluntary turnover | 53.75 | 30.24 | | | | | | | | | | | |
| 2 | Proportion dysfunctional turnover | 58.10 | 31.22 | .11 | | | | | | | | | | |
| 3 | Employee age | 37.37 | 5.44 | .08 | -.14 | | | | | | | | | |
| 4 | Economic environment | 37.91 | 20.68 | .06 | .05 | .03 | | | | | | | | |
| 5 | Organizational performance | 56.74 | 17.49 | -0.29*** | .15 | .04 | .22** | | | | | | | |
| 6 | Operation performance | 61.25 | 17.90 | -.20* | .11 | .02 | .15 | .81*** | | | | | | |
| 7 | Financial performance | 57.50 | 20.68 | -.17 | .06 | .05 | .30*** | .70*** | .48*** | | | | | |
| 8 | Innovation | 59.68 | 26.08 | -.31*** | .21* | -.08 | .00 | .80*** | .58*** | .32*** | | | | |
| 9 | Employee engagement | 48.55 | 24.53 | -.22** | .09 | .14 | .26** | .82*** | .56*** | .47*** | .52*** | | | |
| 10 | Total turnover rate | 21.56 | 25.23 | .12 | -.05 | -.08 | -.16 | -.17 | -.27** | -.20* | -.02 | -.11 | | |
| 11 | Voluntary turnover rate | 12.52 | 17.10 | .42*** | .00 | -.04 | -.15 | -.26** | -.31*** | -.28** | -.12 | -.17 | .91*** | |

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$.

Table 4. Means, standard deviations and correlations of study variables – proximal and distal performance measures

| | Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Proportion voluntary turnover | 53.75 | 30.24 | | | | | | | | | |
| 2 | Proportion dysfunctional turnover | 58.10 | 31.22 | .11 | | | | | | | | |
| 3 | Employee age | 37.37 | 5.44 | .08 | -.14 | | | | | | | |
| 4 | Economic environment | 37.91 | 20.68 | .06 | .05 | .03 | | | | | | |

Table 4 (cont.). Means, standard deviations and correlations of study variables – proximal and distal performance measures

| | Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Sales ('000 000) | 5436.80 | 15194.08 | -.03 | -.20 | -.11 | .35** | | | | | |
| 6 | Productivity ('000) | 6019.44 | 9250.85 | .31* | -.02 | .00 | -.05 | .27 | | | | |
| 7 | RONA | 26.35 | 21.14 | -.14 | -.43* | .01 | .11 | .16 | .25 | | | |
| 8 | Total turnover rate | 21.56 | 25.23 | .12 | -.05 | -.08 | -.16 | -.18 | -.02 | .16 | | |
| 9 | Voluntary turnover rate | 12.52 | 17.10 | .42*** | .00 | -.04 | -.15 | -.13 | .09 | .06 | .91*** | |

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$.

Table 5. Summary of correlation and hypothesis testing

| Performance measure | Turnover rate measure | Correlation size and direction | Support for association |
|---|---|---|---|
| Organizational performance | Total | No significant correlation | No |
| | Voluntary | Small to moderate and negative | Yes |
| Operational performance | Total | Small to moderate and negative | Yes |
| | Voluntary | Moderate and negative | Yes |
| Financial performance | Total | Small to moderate and negative | Yes |
| | Voluntary | Small to moderate and negative | Yes |
| Innovation | Total | No significant correlation | No |
| | Voluntary | No significant correlation | No |
| Employee engagement | Total | No significant correlation | No |
| | Voluntary | No significant correlation | No |
| Sales | Total | No significant correlation | No |
| | Voluntary | No significant correlation | No |
| Productivity | Total | No significant correlation | No |
| | Voluntary | No significant correlation | No |
| RONA | Total | No significant correlation | No |
| | Voluntary | No significant correlation | No |

- Discussion on the association between turnover rate and organizational performance

The direction and magnitude of the correlation results are consistent with the argument that turnover reduces human capital, social capital and interrupts operational processes (Dess et al., 2011). Similarly to Hausknecht and Trevor (2011), the study found that the significance of the correlation between the employee turnover rate measures and operational performance (proximal) is greater compared to the correlation between employee turnover rate measures and financial performance (distal). A probable rationale for this could be the time lag between when the employee turnover decision is effected until the outcome is manifested in the distal outcomes.

A moderate to large positive correlation was found between operational performance, financial performance and employee engagement, indicating that the level of engagement of the employees affects their performance, output and sets the benchmark for new entrants into the organization. Table 3 also indicates a small to moderate positive correlation between the performance of new employees relative to their predecessors and employee engagement. It could be suggested that improvement in organizational performance is not directly related to improved performance by new employees, but mediated through employee engagement.

The lack of any significant positive correlation between organizational performance and total employee turnover rate may result from factors, such as: (1) the lack of power due to sampling size, (2) a curvilinear relationship between the dependent and independent variables, or (3) there is no significant effect. Thus, the study states that new entrants to the organization may only partly enhance the organizational learning aspects such as innovation and employee engagement.

Although no correlation was found between the operating economic environment and the employee turnover measures, given the moderate and positive correlation between financial performance and economic environment, it could be construed that as the economic environment improves, so will financial performance thereby reducing the impact of employee turnover. An improved economic environment may create a greater number of external opportunities, thereby increasing the negative impact on financial performance. At the same time, promotional opportunities may arise in an organization that may have lacked career advancement opportunities, resulting in increased motivational levels and employee engagement. Improved operational and financial performance may influence organizations to invest more into their employees in terms of financial and non-financial benefits that may impact on the intent-to-stay decisions. These complexities could

point to a potential feedback loop where financial performance may induce or reduce employee turnover that again impacts on financial performance.

**3.3. Comparison of subgroups.** Parametric, non-parametric *t*-tests, and a one-way analysis of variance (ANOVA) were used to discern any significant employee turnover rate differences, or any differences in the broad organizational performances between reporting level, union presence, sector, operating model and business orientation (Table 6). An alpha value of 5% was chosen to define the statistical significance. Overall, despite attempts in the study to differentiate between subgroups, no significant difference could be established.

Table 6. Summary of comparison of subgroups

| Subgroup | Measures | Test | Result | Significance |
|---|---|---|---|---|
| Reporting level (organizational or business) | Total, voluntary turnover, operational, financial and organizational performance | Parametric test, Wilcoxon signed-ranks test, Hodges-Lehmann estimation, Satterthwaite approximation | $Z$ = -0.44, $p$ = .33; $Z$ = -1.04, $p$ = .15; $t$ (81) = -0.77, $p$ = .44; $t$ = -1.38, $p$ = .17; $t$ (78.66) = -1.97, $p$ = .05 | No |
| Presence of a majority union | Total, voluntary turnover, operational, financial and organizational performance | Parametric test, Wilcoxon signed-ranks test, Hodges-Lehmann estimation | $Z$ = -0.57, $p$ = .28; $Z$ = 0.33, $p$ = .37; $t$ (81) = -0.05, $p$ = .96; $t$ (81) = -0.02, $p$ = .99; $t$ (81) = 0.52, $p$ = .60 | No |
| Industrial or services sector | Total, voluntary turnover, operational, financial and organizational performance | Parametric test, Wilcoxon signed-ranks test, Hodges-Lehmann estimation | $Z$ = -0.50, $p$ = .31; $Z$ = 0.19, $p$ = .19; $t$ (81) = -1.12, $p$ = .27; $t$ (81) = -2.49, $p$ = .01; $t$ (81) = -1.78, $p$ = .08 | No |
| Operating model (profit motive) | Total, voluntary turnover, operational, financial and organizational performance | Parametric test, Wilcoxon signed-ranks test, Hodges-Lehmann estimation | $Z$ = 0.89, $p$ = .19; $Z$ = 1.44, $p$ = .07; $t$ (81) = -0.73, $p$ = .47; $t$ (81) = 0.02, $p$ = .98; $t$ (81) = -1.24, $p$ = .22 | No |
| Business orientation (product, service or product and service) | Total, voluntary turnover, operational, financial and organizational performance | ANOVA | $F$ (2.78) =0.51, $p$ = .60; $F$ (2,78) =0.42, $p$ = .66; $F$( 2.78) = 0.04, $p$ = .96; $F$ (2.78) = 0.64, $p$ = .53; $F$ (2.78) = 0.08, $p$ = .93 | No |

**3.4. Determining an employee turnover model.** The second aim of this study was to determine if a curvilinear relationship existed between employee turnover rate and organizational performance that could inform an optimal employee turnover rate for organizations in South Africa.

- Operational performance

The initial multiple regression analysis with operational performance (dependent variable) and total employee turnover rate (main independent variable) indicated that a linear model provides the best fit (Figure 2). Although the adjusted $R^2$ was not the highest amongst the three models, the information criteria pointed to a linear model (Table 7).

Table 7. Initial multiple regression output – impact of total turnover rate on operational performance

| Variable | Linear model | | Quadratic model | | Cubic model | |
|---|---|---|---|---|---|---|
| | B | SE | B | SE | B | SE |
| Intercept | 27.00*** | 4.74 | 26.00*** | 4.79 | 29.00*** | 5.07 |
| Financial performance | 0.18** | 0.08 | 0.18** | 0.08 | 0.17** | 0.08 |
| Innovation | 0.27*** | 0.06 | 0.27*** | 0.06 | 0.26*** | 0.06 |
| Employee engagement | 0.17** | 0.07 | 0.17** | 0.07 | 0.17** | 0.07 |
| Total turnover rate | -0.10** | 0.06 | -0.20 | 0.10 | -0.10 | 0.10 |
| Total turnover rate$^2$ | - | - | 2.31E-04 | 0.00 | -6.23E-03 | 0.00 |
| Total turnover rate$^3$ | - | - | - | - | 4.87E-05 | 0.00 |
| $F$ | 20.20*** | | 15.97*** | | 13.89*** | |
| $R^2$ | 0.51 | | 0.51 | | 0.52 | |
| Adj $R^2$ | 0.48 | | 0.48 | | 0.49 | |
| Information criteria | | | | | | |
| AIC | 428.82† | | 430.77 | | 430.40 | |
| BIC | 431.46† | | 433.70 | | 433.67 | |
| SBC | 440.92† | | 445.29 | | 447.33 | |
| PC | 0.55† | | 0.57 | | 0.56 | |

Notes for parameters: B = unstandardized parameters, $\beta$ = standardized parameters, * $p < .10$, ** $p < .05$, *** $p < .01$.
Notes for information criteria: AIC = Akaike's, BIC = Bayesian, SBC = Schwarz Bayesian, PC = Prediction, † = model with best (lowest) score.

Further analysis was undertaken to test the validity of the linear model and various data characteristics assumptions. The raw Durbin-Watson D statistic was 2.07, hence there was no risk of autocorrelation.

A robust regression analysis was conducted to counter any potential influence of the outliers on the final regression parameters.

All the parameters remained unchanged, with the exception of total employee turnover where the magnitude of the slope was increased from $B$ = -.10 to $B$ = -0.14.

In the final multiple regression analysis, total employee turnover rate significantly predicts operational performance, $B$ = -0.14, $t$ (78) = -2.36, $p$ < .02. The variables in the multiple regression analysis explained a significant proportion of variance in operational performance, Adj $R^2$=.48, $F$ (4, 78) = 20.20, $p$ < .001.

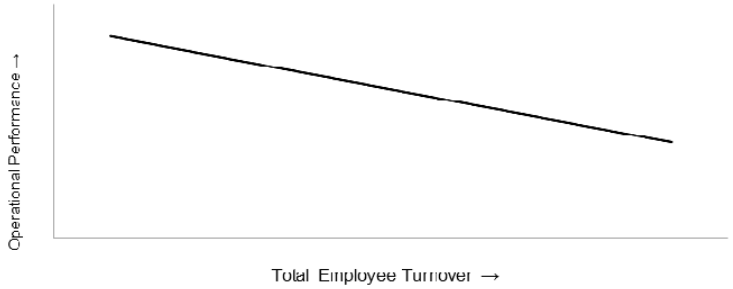



**Fig. 2. Impact of total turnover rate on operational performance**

A multiple regression analysis was conducted with operational performance (dependent variable) and voluntary employee turnover rate (main independent variable). Further analysis was undertaken to test the validity of the model and various data characteristics assumptions. The raw Durbin-Watson D statistic was 2.03, hence there was no risk of autocorrelation. In the case of the impact of voluntary employee turnover rate on operational performance, the quadratic term's slope parameter was not significant, however the slope parameter for voluntary turnover rate in the linear model was significant at $p$ < .10. Post removal of the influential outlier, the regression indicated a better approximation to a linear model (Table 8). In the robust regression outputs, the linear model, voluntary employee turnover rate was a significant variable, whereas in the quadratic model, none of the voluntary employee turnover rate variables (original or squared) were significant. The adjusted $R^2$ in the quadratic model was similar to that of the linear model. Overall the linear model was retained.

Table 8. Revised multiple regression output – impact of voluntary turnover rate on operational performance

| Variable | Linear model | | Quadratic model | | Cubic model | |
|---|---|---|---|---|---|---|
| | B | SE | B | SE | B | SE |
| Intercept | 25.00*** | 5.09 | 26.00*** | 5.35 | 28.00*** | 5.47 |
| Financial performance | 0.20** | 0.08 | 0.20** | 0.08 | 0.19** | 0.08 |
| Innovation | 0.26*** | 0.06 | 0.26*** | 0.06 | 0.26*** | 0.06 |
| Employee engagement | 0.19** | 0.07 | 0.19** | 0.07 | 0.19** | 0.07 |
| Total turnover rate | -0.10 | 0.10 | 0.01 | 0.19 | 0.02 | 0.19 |
| Total turnover rate$^2$ | - | 0.1 | -3.43E-03 | 0.01 | -0.03 | 0.02 |
| Total turnover rate$^3$ | - | - | - | - | 5.04E-04 | 0.00 |
| $F$ | 19.75*** | | 15.70*** | | 13.54*** | |
| $R^2$ | 0.51 | | 0.51 | | 0.52 | |
| Adj $R^2$ | 0.49 | | 0.48 | | 0.48 | |
| Information criteria | | | | | | |
| AIC | 418.98† | | 420.70 | | 420.69 | |
| BIC | 421.63† | | 423.65 | | 424.00 | |
| SBC | 430.95† | | 435.07 | | 437.45 | |
| PC | 0.55† | | 0.57 | | 0.57 | |

Notes for parameters: B = unstandardized parameters, $\beta$ = standardized parameters, * $p$ < .10, ** $p$ < .05, *** $p$ < .01.
Notes for information criteria: AIC = Akaike's, BIC = Bayesian, SBC = Schwarz Bayesian, PC = Prediction, † = model with best (lowest) score.

The robust multiple regression analysis points out that voluntary employee turnover rate significantly predicts operational performance, $B$ = -0.17, $t$ (78) = -1.97, $p$ < .05..001.

The variables in the multiple regression analysis explained a significant proportion of variance in operational performance, Adj $R^2$ = .47, $F$ (4, 78) = 19.39, $p$ < .001.

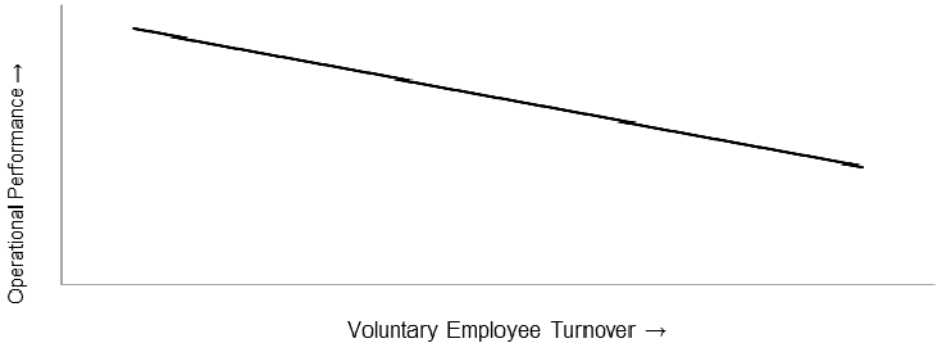



**Fig. 3. Impact of voluntary turnover rate on operational performance**

♦ Financial performance

A multiple regression analysis with financial performance (dependent variable) and total employee turnover rate (main independent variable) designs the linear model as the best fit (Figure 4). This is indicated through the highest adjusted $R^2$ and supported by the information criteria (Table 9).

Table 9. Initial multiple regression output – impact of total turnover rate on financial performance

| Variable | Linear model | | Quadratic model | | Cubic model | |
|---|---|---|---|---|---|---|
| | B | SE | B | SE | B | SE |
| Intercept | 19.00** | 7.64 | 19.00** | 7.70 | 21.00** | 8.35 |
| Financial performance | 0.18* | 0.10 | 0.18* | 0.10 | 0.18* | 0.10 |
| Innovation | 0.35** | 0.13 | 0.35** | 0.13 | 0.33** | 0.14 |
| Employee engagement | 0.20** | 0.10 | 0.21** | 0.10 | 0.21** | 0.10 |
| Total turnover rate | -0.10 | 0.08 | -0.04 | 0.14 | -0.02 | 0.14 |
| Total turnover rate$^2$ | - | - | -1.39E-04 | 0.00 | -3.47E-03 | 0.01 |
| Total turnover rate$^3$ | - | - | - | - | 2.51E-05 | 0.00 |
| *F* | 9.37*** | | 7.40*** | | 6.16*** | |
| $R^2$ | 0.32 | | 0.32 | | 0.33 | |
| Adj $R^2$ | 0.29 | | 0.28 | | 0.27 | |
| Information criteria | | | | | | |
| AIC | 479.25† | | 481.24 | | 482.91 | |
| BIC | 481.89† | | 484.17 | | 486.19 | |
| SBC | 491.35† | | 495.76 | | 499.84 | |
| PC | 0.76† | | 0.78 | | 0.80 | |

Notes for parameters: B = unstandardized parameters, $\beta$ = standardized parameters, * $p < .10$, ** $p < .05$, *** $p < .01$.
Notes for information criteria: AIC = Akaike's, BIC = Bayesian, SBC = Schwarz Bayesian, PC = Prediction, † = model with best (lowest) score.

Further analysis was undertaken to test the validity of the linear model and various data characteristics assumptions. The raw Durbin-Watson D statistic was 2.01, hence there was no risk of correlation. After robust regression analysis, it is found that total employee turnover significantly predicts financial performance. The variables in the multiple regression analysis explained a significant proportion of variance in financial performance, Adj $R^2 = .29$, $F(4, 78) = 9.37$, $p < .001$.

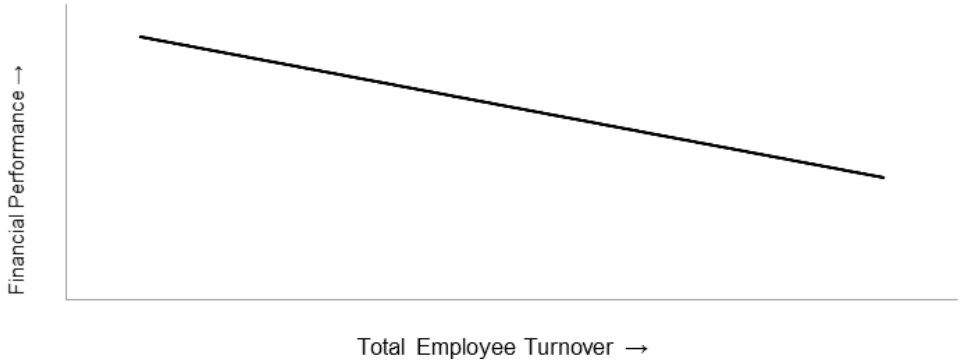



**Fig. 4. Impact of total turnover rate on financial performance**

An initial multiple regression analysis with financial performance (dependent variable) and voluntary employee turnover rate (main independent variable), indicates that a cubic model provides the best fit. This is indicated through the highest adjusted $R^2$ and supported by the AIC, BIC and PC information criteria (Table 10).

Table 10. Initial multiple regression output – impact of voluntary turnover rate on financial performance

| Variable | Linear model | | Quadratic model | | Cubic model | |
|---|---|---|---|---|---|---|
| | B | SE | B | SE | B | SE |
| Intercept | 21.00*** | 7.64 | 20.00** | 7.71 | 24.00*** | 8.00 |
| Financial performance | 0.18* | 0.10 | 0.19* | 0.10 | 0.20** | 0.10 |
| Innovation | 0.32** | 0.13 | 0.34** | 0.13 | 0.32** | 0.13 |
| Employee engagement | 0.20** | 0.10 | 0.17* | 0.10 | 0.16* | 0.10 |
| Total turnover rate | -0.20 | 0.12 | -0.40* | 0.21 | -0.20 | 0.22 |
| Total turnover rate$^2$ | - | - | 4.95E-03 | 0.00 | -0.02 | 0.01 |
| Total turnover rate$^3$ | - | - | - | - | 3.08E-04* | 0.00 |
| *F* | 9.85*** | | 8.21*** | | 7.59*** | |
| $R^2$ | 0.34 | | 0.35 | | 0.37 | |
| Adj $R^2$ | 0.30 | | 0.31 | | 0.33 | |
| Information criteria | | | | | | |
| AIC | 477.89 | | 478.35 | | 476.85† | |
| BIC | 480.53 | | 4.81.28 | | 480.12† | |
| SBC | 489.99† | | 492.87 | | 493.78 | |
| PC | 0.75† | | 0.75 | | 0.74† | |

Notes for parameters: B = unstandardized parameters, $\beta$ = standardized parameters, * $p < .10$, ** $p < .05$, *** $p < .01$.
Notes for information criteria: AIC = Akaike's, BIC = Bayesian, SBC = Schwarz Bayesian, PC = Prediction, † = model with best (lowest) score.

After further analysis to test the validity of the model, the outliers were removed and the regression analysis repeated. The raw Durbin-Watson D statistic was 2.14, hence there was no risk of autocorrelation. A linear model provided a better approximation (Table 11).

Table 11. Revised multiple regression output – impact of voluntary turnover rate on financial performance

| Variable | Linear model | | Quadratic model | | Cubic model | |
|---|---|---|---|---|---|---|
| | B | SE | B | SE | B | SE |
| Intercept | 21.00*** | 7.57 | 23.00*** | 7.84 | 22.00 | 8.33 |
| Financial performance | 0.32** | 0.10 | 0.21** | 0.10 | 0.21** | 0.10 |
| Innovation | 0.35*** | 0.13 | 0.34** | 0.13 | 0.35** | 0.13 |
| Employee engagement | 0.14 | 0.10 | 0.15 | 0.10 | 0.15 | 0.10 |
| Total turnover rate | -0.30** | 0.16 | -0.10 | 0.25 | -0.10 | 0.25 |
| Total turnover rate$^2$ | - | - | -0.01 | 0.01 | 4.10E-04 | 0.02 |
| Total turnover rate$^3$ | - | - | - | - | -1.94E-04 | 0.00 |
| *F* | 10.99*** | | 8.95*** | | 7.40*** | |
| $R^2$ | 0.37 | | 0.37 | | 0.37 | |
| Adj $R^2$ | 0.33 | | 0.33 | | 0.32 | |
| Information criteria | | | | | | |
| AIC | 463.14† | | 464.21 | | 466.04 | |
| BIC | 465.79† | | 467.16 | | 469.35 | |
| SBC | 475.11† | | 478.58 | | 482.80 | |
| PC | 0.72† | | 0.73 | | 0.74† | |

Notes for parameters: B = unstandardized parameters, $\beta$ = standardized parameters, * $p < .10$, ** $p < .05$, *** $p < .01$.
Notes for information criteria: AIC = Akaike's, BIC = Bayesian, SBC = Schwarz Bayesian, PC = Prediction, † = model with best (lowest) score.

After a final robust multiple regression analysis for the linear and cubic models, it is found that, in the cubic model, at least one of the voluntary employee turnover rate variables (cubed variable) is a significant variable, whereas in the linear model the variable is not significant in the robust regression (Table 12 and 13).

Table 12. Robust multiple regression analysis predicting the impact of voluntary turnover rate on financial performance (Linear model)

| Variable | Effect on financial performance | | | |
|---|---|---|---|---|
| | B | SE | 95% CI | Bootstrap 95% CI |
| Intercept | 22.92*** | 8.22 | 6.55 to 39.29 | 10.64 to 39.73 |
| Economic environment | 0.18* | 0.10 | -0.01 to 0.37 | -0.05 to 0.36 |
| Operation performance | 0.32** | 0.13 | 0.06 to 0.59 | 0.05 to 0.59 |
| Employee engagement | 0.20** | 0.10 | 0.01 to 0.39 | -0.03 to 0.41 |
| Voluntary turnover rate | -0.15 | 0.12 | -0.39 to 0.08 | -0.48 to 0.10 |

Table 13. Robust multiple regression analysis predicting the impact of voluntary turnover rate on financial performance (Cubic model)

| Variable | Effect on financial performance | | | |
|---|---|---|---|---|
| | B | SE | 95% CI | Bootstrap 95% CI |
| Intercept | 23.39*** | 8.29 | 6.88 to 39.89 | 10.64 to 40.00 |
| Economic environment | 0.20** | 0.10 | 0.01 to 0.38 | -0.03 to 0.38 |
| Operation performance | 0.32** | 0.13 | 0.06 to 0.59 | 0.05 to 0.59 |
| Employee engagement | 0.16* | 0.10 | -0.03 to 0.36 | -0.07 to 0.37 |
| Voluntary turnover rate | 0.41 | 0.57 | -0.73 to 1.54 | -1.18 to 1.42 |
| Voluntary turnover rate$^2$ | -0.03 | 0.02 | -0.07 to 0.04 | -0.07 to 0.04 |
| Voluntary turnover rate$^3$ | 3.08E-04* | 0.00 | -0.00 to 0.00 | -0.00 to 0.00 |

Note: N = 83, B = unstandardized effect, $\beta$ = standardized effect, * $p < .10$, ** $p < .05$, *** $p < .01$.
Confidence intervals estimated using percentile bootstrapping with 10,000 re-samples.

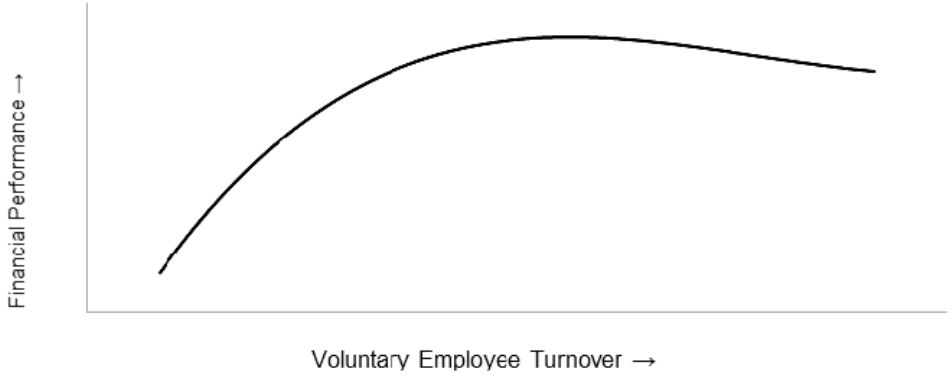



**Fig. 5. The impact of voluntary turnover rate on financial performance**

Overall the cubic model is retained (Figure 5).

The results reveal that voluntary employee turnover$^3$ significantly predicts financial performance, $B$ = 3.08E-04, $t$ (76) = 1.81, $p < .07$. The variables in the multiple cubic regression analysis explained a significant proportion of variance in financial performance, Adj $R^2$ =.33, $F$ (6,76) = 7.59, $p < .001$.

Differentiation was applied to the cubic function to determine the voluntary employee turnover rate where the slope of the cubic function was zero. The roots of the derived quadratic function were determined and substituted into the equation derived from differentiating the quadratic function to determine if these roots indicated the maximum or minimum turning points on the quadratic function. The results indicate that financial performance is optimized when the voluntary employee rate is equal to 33%. Taking into account the mean proportion of dysfunctional turnover, the optimal functional voluntary employee turnover rate is calculated at 14%.

♦ Organizational performance

A multiple regression analysis with organizational performance (dependent variable) and total employee turnover rate (main independent variable) does not indicate any variables with significant slopes.

A multiple regression analysis with organizational performance (dependent variable) and voluntary employee turnover rate (main independent variable), points out that a cubic model provides the best fit (Figure 6). This is indicated through the highest adjusted $R^2$ and supported by the AIC, BIC and PC information criteria (Table 14).

Table 14. Multiple regression output – impact of voluntary turnover rate on organizational performance

| Variable | Linear model | | Quadratic model | | Cubic model | |
|---|---|---|---|---|---|---|
| | B | SE | B | SE | B | SE |
| Intercept | 46.28*** | 5.04 | 43.51*** | 5.13 | 46.29*** | 5.34 |
| Disfunctional | 0.09 | 0.06 | 0.10 | 0.06 | 0.10* | 0.06 |
| Economic environment | 0.12 | 0.09 | 0.14 | 0.09 | 0.13 | 0.09 |
| Employee relative performance | 0.06 | 0.04 | 0.04 | 0.04 | 0.05 | 0.04 |
| Total turnover rate | -0.24** | 0.11 | -0.55*** | 0.19 | -0.43** | 0.20 |
| Total turnover rate$^2$ | - | - | 7.58E-03** | 3.76E-03 | -0.01 | 0.01 |
| Total turnover rate$^3$ | - | - | - | - | 2.70E-04* | 1.61E-04 |
| F | 3.30** | | 3.55*** | | 3.49*** | |
| $R^2$ | 0.14 | | 0.19 | | 0.22 | |
| Adj $R^2$ | 0.10 | | 0.13 | | 0.15 | |
| Information criteria | | | | | | |
| AIC | 471.08 | | 468.82 | | 467.85$^\dagger$ | |
| BIC | 473.72 | | 471.74 | | 471.12$^\dagger$ | |
| SBC | 483.18$^\dagger$ | | 483.33 | | 484.78 | |
| PC | 0.97 | | 0.94 | | 0.74$^\dagger$ | |

Notes for parameters: B = unstandardized parameters, $\beta$ = standardized parameters, * $p < .10$, ** $p < .05$, *** $p < .01$.
Notes for information criteria: AIC = Akaike's, BIC = Bayesian, SBC = Schwarz Bayesian, PC = Prediction, $^\dagger$ = model with best (lowest) score.

Further analysis was undertaken to test the validity of the quadratic model and various data characteristics assumptions. The raw Durbin-Watson D statistic was 2.09, hence there was no risk of autocorrelation.

The results signal that the proportion of dysfunctional turnover significantly predicts organizational performance, $B = 0.10$, $t\ (76) = 1.72$, $p < .09$, as well as voluntary employee turnover rate, $B = -0.43$, $t\ (76) = -2.13$, $p < .04$. Moreover, voluntary employee turnover rate$^3$ also significantly predicts financial performance, $B = 2.70E\text{-}04$, $t\ (76) = 1.66$, $p < .10$. The variables in the multiple cubic regression analysis explained a significant proportion of variance in organizational performance, Adj $R^2 = .15$, $F\ (6,76) = 3.49$, $p < .004$.

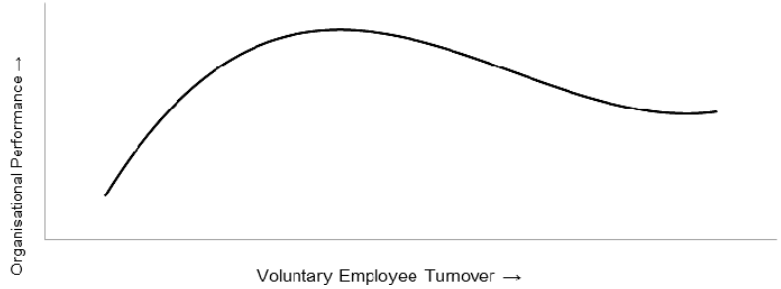



**Fig. 6. The impact of voluntary turnover rate on organizational performance**

Differentiation was applied to the cubic function to determine the voluntary employee turnover rate where the slope of the cubic function was zero. Organizational performance was optimized when the voluntary employee rate is equal to 46%. Taking into account the mean proportion of dysfunctional turnover, the optimal functional voluntary employee turnover rate was calculated at 19%.

♦ Discussion on the form of the relationship

The study found that total employee turnover rate is not a significant predictor of organizational performance. However, total employee turnover rate predicts operational and financial performance, through a linear negative relationship. Voluntary employee turnover is also found to affect significantly operational performance through a negative linear relationship.

Table 15. Summary of regression model output and hypothesis testing

| Performance measure | Turnover rate measure | Regression model | Support for hypothesis |
|---|---|---|---|
| Operational performance | Total | Linear with negative slope | No |
| | Voluntary | Linear with negative slope | No |
| Financial performance | Total | Linear with negative slope | No |
| | Voluntary | Cubic | Yes |
| Organizational performance | Total | - | No |
| | Voluntary | Cubic | Yes |

The prediction of a linear negative relationship supports the human capital theory, which asserts that the accumulation of human capital enhances organizational performance. The loss in human capital, mostly employee training and development, yields negative results for the organization in the form of proximal and distal outcomes. In accordance to the findings of Hausknecht and Trevor (2011), the study found that total and voluntary employee turnover explained respectively 48% and 47% of the variance in operational performance (proximal), whereas total employee turnover explained 29% of the variance in financial performance (distal).

The proportion of dysfunctional to functional turnover was not a significant control variable in the multiple regression analysis. Innovation was a significant predictor of operational performance, illustrating the need for organizations to adapt to a highly volatile operating environment to enhance operational performance (Staw, 1980). The analysis indicated that 33% of the financial performance is explained by the voluntary employee turnover rate with only 15% of the organizational variation explained by the same independent variable.

Similarly to Shaw et al. (2005), this study found that voluntary employee turnover rate significantly predicted financial and organizational performance through a curvilinear relationship representing a cubic function (Figure 5, 6). The cubic function suggests that organizational (financial) performance increases as employee turnover rates rise above zero and move out of the 'trained incapacity' regime with the infusion of innovation and new approaches. As the employee turnover rate continues to increase, the losses in human and social capital, increase in turnover costs, loss of knowledge and organizational memory outweigh the benefits and an optimal point is reached. A further increase in the employee turnover rate beyond this optimal point, exposes the negative relationship with a decrease in organizational (financial) performance. Through the loss of human capital the organizational (financial) performance would continue to reduce up to the point where the level of firm-specific human capital is low and hence the time required to build firm-specific human capital is reduced. Hence, new entrants to the organization would be able to match previous performance levels a lot quicker reducing the total impact on organizational (financial) performance. Retention of a poor performance employee may be more deleterious to organizational performance than replacing the employee, provided the new entrant's performance is superior.

The proportion of dysfunctional turnover failed to significantly predict financial performance, however it did significantly predict organizational performance. Human Resource policy, employee retention schemes and managerial effort should be geared towards reducing dysfunctional employee turnover.

The optimal voluntary turnover rate was determined where the slope of the organizational performance curve equals zero. The optimal employee turnover rate for financial performance was determined to be 33%, whereas the optimal point for organizational performance was 46%.

Through the application of differentiation, the study ascertained that the optimal functional voluntary employee turnover rate was calculated between 14 and 19% for organizations in South Africa.

## Conclusion

The study found support for the existence of an optimal voluntary employee turnover rate for organizations in South Africa. Therefore, organizations need to establish their specific optimal functional voluntary employee turnover rate. An investigation should be conducted to determine how organizational performance could be maximized, given the trade-off decisions between the costs of employee turnover and the costs of specific interventions. The specific optimal rate may not be achievable and an organization may need to put systems in place to cope with a sub-optimal employee turnover rate.

The research yields a better understanding of the implications of employee turnover on organizational performance. The existence of a curvilinear relationship implies that managers and business leaders can no longer assume that a lower employee turnover rate is beneficial to the organization. Through the knowledge and understanding of the impact of employee turnover rates on organizational performance, a multi-disciplinary approach to human capital management can be advantageous to manage a shift in human resources to benefit organizational performance. Finally, the development of employee value propositions, retention strategies and initiatives to address dysfunctional voluntary employee turnover rates should take cognisance of the fact that any shift in employee turnover rate affects organizational (financial) performance.

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