Analysis of performance reward models: A Multinum Investments case study.

Michael Mncedisi Willie
Council for Medical Schemes (until 30 April 2014), South Africa.
michaelmncedisiwillie@gmail.com

Problem Statement: *Performance management remains one onf the importance factors that affect the overall performance of organizations. The concept of performance management is often linked to performance reward system; it is also known that financial incentives that are tied to performance appraisal also impact on an effective appraisal system and better performance of organisations. The purpose of this paper was to assess two models that measure performance, namely normalization and modified normalization performance scores models*

Methodology: *The study design was a retrospective case study on an investment company data. . The hypothesis in the current study was that, the modified normalization performance scores model reduces bias and performs better than the normalisation score models. Final performance scores were used to assess performance of the two models.*

Results: *The results illustrate that there was no significant differences between the two models. Thus, the modifying normalization performance scores does not improve the model without adjusting for other factors that also introduces bias.*

Originality/Value: *We recommend that alternative approaches other that normalisation of performance scores be employed, these methods need to also adjust for factors such as the supervisors or managers effect, complexity of the job, variation in the job functions and the business unit size.*

Keywords: *Performance management, Management education, Normalization, Business management and research*

INTRODUCTION

The concept of performance management is and will still remain a key process of connecting people management to overall performance of the organisation. Extensive literature links performance management to the overall strategy of the organisation (Callaghan, 2005; Adler, 2011; Chau, 2008). According to Saravanja (2010), performance management has to be approached from an integrated perspective, where there is synergy between the performance management system and strategic planning. Performance management system is an important part of performance management process, these systems consist of measuring and monitoring the achievement of the goals through clearly defined key performance indicators.

Performance management system is described in literature as a strategic and integrated approach to increase the effectiveness of organizations (Armstrong and Baron, 1998; Zhang, 2012). According to

Desimone, Werner & Harris (2002), PMS is a tool used by organisation to manage and monitor performance. Effectiveness of organisations is achieved through improving the performance of staff by continuously developing their capabilities within the organisation. Other authors have linked effective performance management system as those that reward employees who perform well. Mujtaba and Shuaib (2010) support this argument and recommend that any reward and recognition program should be part of an integrative and comprehensive performance management system that is strategically aligned with the organisations missions and visions.

In recent years, South African private companies and most government entities have increasingly started to link reward to performance (Callghan, 2005; Bhengu, 2012). On the international front, it is reported that large organizations are achieving better results and greater employee engagement by linking reward directly to performance (Shah *et al*, 2012; Amstrong, 2010). A study by Lawler *et al* (2012) found that bonuses and salary increase tied to performance appraisals are associated with a more effective appraisal and better organization performance. There is other body of literature that indicates that views performance management process as a very convoluted process due to a number of reasons, one being that the direct reward (or the withholding thereof) for performance may impact on the employee's motivation to perform better (or worse).

A performance reward management system that lack objectivity may become unsustainable or controversial. Leneburg (2012) discussed the methods and most factors that may adversely impact the objectivity of PMS. The four common rating errors described by the author include strictness, leniency, central tendency, hallo effect and recent events. The rating scale method is the most common method of recording and evaluating employees and is also used for deciding promotions and annual increase. These methods continue to attract controversy due to bias as well as inconsistencies when implemented.

The normalization of scores generally compares and standardizes performance scores of individuals belonging to different business functions in an organisation. A recent study by Sarkar et *al* (2011) proposed a modified methodology of normalization of scores; with an illustrative example the authors found that the modified methodology reduced bias in the form of association between the rank of an individual and organizational functional. A study by Vaishnav and Denos (2005) discussed limitations associated with normalization of scores in the performance management system; the authors warned that performance management system that employs normalization of scores methodology need to also adjust for supervisor's or manager's effect.

Zewotir (2012) argues that unless the same supervisor is evaluating all employees in the organisation, then there is likely a bias effect that maybe be introduced in the process. The author further noted that supervisor based effects is a significant factor that cannot be ignored in any employees' performance appraisal. In a current study, we conducted a comparison analysis between the normalisation and modified normalisation of performance scores model. The modified model was proposed by Sarkar *et al* (2011) as a better model that also reduces bias. The hypothesis in the current article is that the modified normalization of scores methodology does not necessarily reduce bias; this hypothesis was not coupled with factors such as job complexity, variances in job functions and as well the supervisor's effect. Thus, the primary objective of the study was to assess the overall performance of employees at Multinum Investments for the 2011 financial year. The secondary objective was to compare the ordinal normalization scoring process and the modified methodology.

METHODS

RESEARCH POPULATION AND SAMPLE

Multinum Investments is a consulting firm that operates in the financial market; the organisation consisted of 90 employees which are employed to serve in each of the 11 business units. As a part of the performance management assessment process, which is linked promotion policy; employees of Multinum Investments were assessed for performance reflecting the 2011 financial year. Employees were assessed for both the mid-year and final assessment and total scores were obtained. The final scores obtained for each employee took into account the scores allocated by the line managers and the weights allocated to both the leadership and functional dimension.

The difficulty in assessing overall scores of the business units is that business units differ in terms of expertise, and the type of service they deliver, difficulty of the job and the number of employees is not comparable across units. In this regard, the evaluation of performance to subjective functional areas depends on the line mangers; as a result scores vary from one manager to another manager. Thus, no attempts were made to standardize scope of each business unit and the number of employees. Six employees were excluded in the final analysis due to non-comparability, thus the final sample included 84 employees representing eleven business units.

PROCEDURE

There is a great body of literature that discusses performance rating methods, Stewart *et al* (2010) describe a plethora of terms used in literature but describe the same type of performance, these include terms like forced distribution, forced ranking system, bell curve, group ordering or normal distribution. All these are often used in performance evaluation system to rate and rank employees in terms of performance. According to Sarkar et *al* (2011), many organizations employ these rating systems where all the scores of various functions are combined, irrespective of outliers and calculate the overall average and standard deviation. As per normal distribution, high performers are then selected whose scores are more than (average + 'Z' times the standard deviation). The 'Z' value is the standardized normal variable or the Z score. For example, to identify the top 10 per cent of employees, then the Z score will be 1.28155 (Sakar *et al,* 2011). The normalisation of scores is the methodology employed at Multinum and the scores were used to determine employees that qualify for performance incentive such as Bonuses or annual increments.

The performance incentive employed by Multinum Investments was also based to the above illustration, the performance factors are displayed in Table 1. Employees who obtained scores of less 35.205 did not meet the minimum criterion for financial reward and these denoted as underperformers. Employees that obtained performance score of more than 42.205 points were regarded as outstanding performers and were subject to a performance bonus factor 10%. Table 1 depicts the grading of scores stratified by performance reward incentive level.

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Grading range	Incentive level
[0-35.205]	0%
(35.205-37.205]	7%
(37.205-39.205]	8%
(39.205-41.205]	9%
41.205+	10%

Table 1: Multinum Investments Performance Grading & Incentive Levels

DATA ANALYSIS METHOD

The study design was a retrospective case study on the 2011 performance data of an investment company. In this study, descriptive statistics including simple frequencies and mean ratings were computed on the overall scores. Paired t-test for the difference between the average score for the mid-year assessments and final year assessments were conducted. Significance was determined at 5% level. The analysis was done with a system designed for statistical analyses (SAS, 9.2). The total scores were tested for normality on all employees, six observations were identified as outliers were identified, and these were removed from the final. The final data set was re-tested for normality. Model 1 (M1) denoted the observed scores as per the Mutinum Investments performance management, Model 2 (M2) was a modification of Model 1 as outlined by Sarkar *et al* (2011). In Model 2, Z-score for each business unit are computed and the final comparable score for Model 2 was computed for each employee as follows: Comparable score = overall average + Z score × overall standard deviation.

RESULTS

DESCRIPTIVE ANALYSIS

The analysis included 84 employees out of the 90 total employees from 11 business units, this represented 93.3% of all employees, and the average number of employees for the sample used was eight (8) employees per business unit. The study also evaluated the performance scores that were obtained during the mid-year and the final year end assessment, this assessment was based on Model 1. The paired t-test indicates a significant improvement of performance scores compared to mid-year scores, the average improvement score was 0.1237 with 95% CI[1] (0.095-0.1592). Thus, final year end results were used for comparison analysis between the two models. A comparison analysis between the two models indicates no significant differences, average score for Model 1 was 38.033 with 95% CI (37.4803, 38.5863) and the average score for Model 2 was 37.1538 with 95% CI (36.6415, 37.666). Figure1 below further depicts data a computed on Method 1 and that computed for Method 2 on the employees.

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[1] CI: Confidence Interval
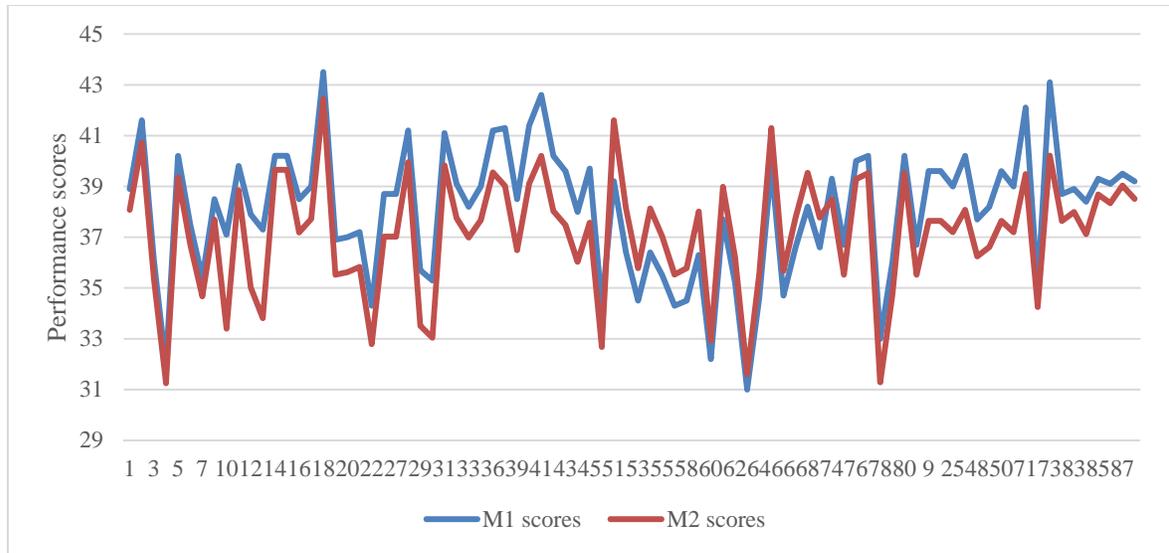
Figure 1: Performance Scores for Method 1 and Method 2, N=84

Table 2 below depicts descriptive statistics computed from Model 1, the average scores stratified by business unit. There was no significant differences across departments, the Innovations department obtained the highest average number of score at 39.5 (SD=2.4, n=9). The Retail Sales and the Legal business units obtained the second higher average score at 39.4(SD=2.1, n=11) and 39.4 (SD=1.3, n=4), respectively. Overall, the Productions and the Investigations department obtained lower scores compared to the other at 35.9 (SD^2=1.6, n=8) and 35.7 (SD=2.7, n=10) respectively.

Business Unit	Mean	Standard deviation (SD)	N
Purchase	37.5	3.0	8
Finance	38.8	1.5	6
Human Resources (HR)	38.1	2.8	7
Information Technology (IT)	38.5	2.5	6
Legal	39.4	1.3	4
Innovations	39.5	2.4	9
Production	35.9	1.6	8
Investigation	35.7	2.7	10
Manufacturing	37.8	2.6	8
Retail sales	39.4	2.1	11
Marketing	39.0	0.4	7

**Table 2: Descriptive Analysis of Scores by Business Unit**

[2] SD: Standard Deviation

Table 3 below depicts comparison analysis between the two models on the number of employees controlling for performance incentive level, the data illustrates a significant difference between the number of employees that were considered for incentive levels, 7%, 9% and 10%. These data are further explored in the next section; for the purpose of the current article we stratified the 7% and the 9% incentives by each of the departments at Multinum.

|	0%	10%	7%	8%	9%	Total
Model 1 (M1)	14	3	25	28	14	84
Model 2 (M2)	13	7	17	26	21	84

Table 3: Number of Rank Holder for Method 1 And Method 2 Stratified by Incentive Level

The top ranks (7 per cent incentive), Figure 3 below depicts the comparison analysis between M1 and M2 adjusting for the 7% incentive level. The data illustrates that Method 2 was more biased towards Legal, Retail Sales and Innovations. In contrast Method 1 was biased towards Finance. Overall there were no significance differences between Method 1&2 for the 7% incentive levels in other departments
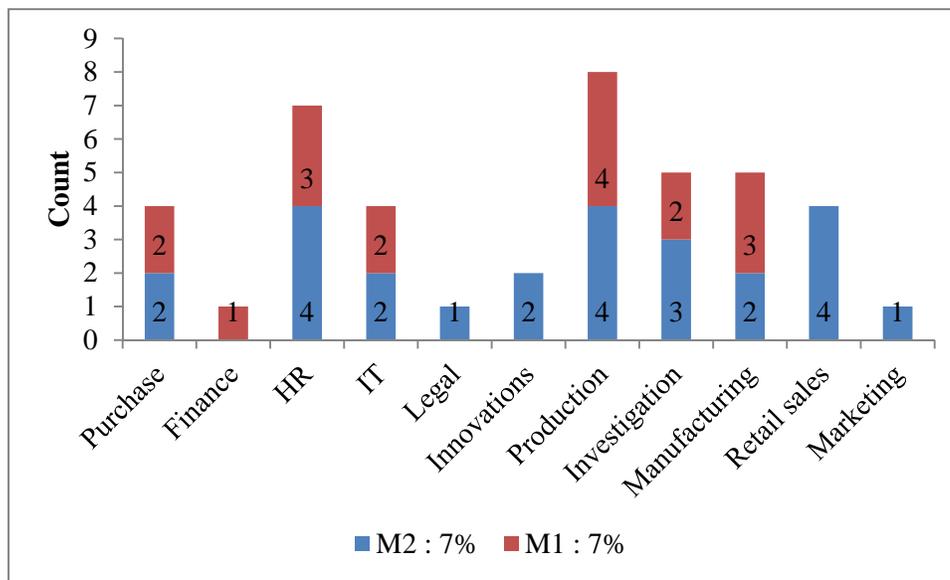
Figure 2: Number of Rank Holder for Method 1 and Method 2 For The 7% Incentive Level, HR: Human Resources, IT: Information Technology

The top ranks (9 per cent incentive), Figure 2 below depicts the comparison analysis between M1 and M2 adjusting for the 9% incentive level. The data illustrates that Method 2 was more biased toward Innovations; the results depicted in Figure 3 also indicate that Method 1 was biased towards Retail sales.
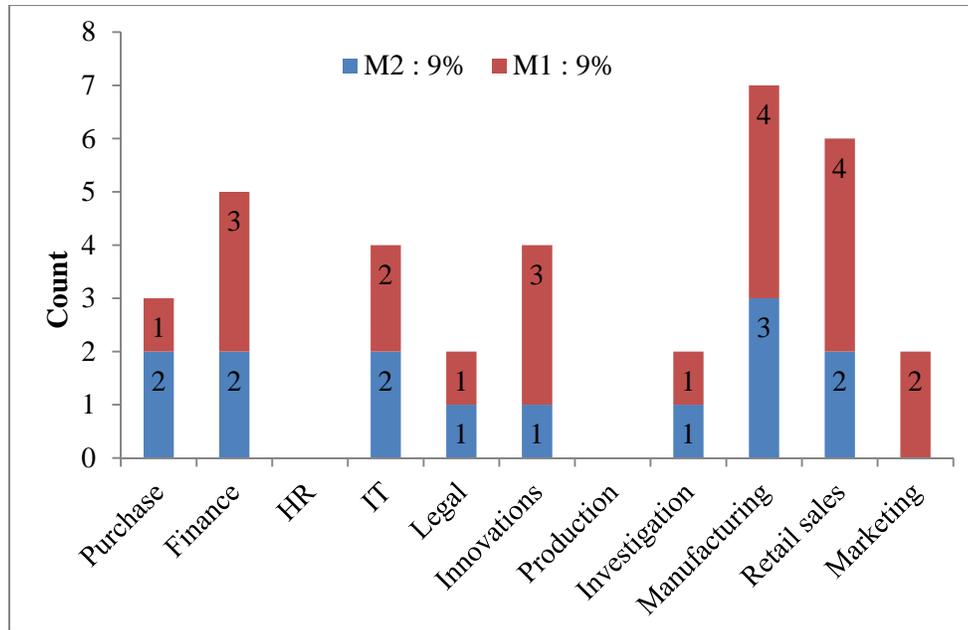
Figure 3: Number of Rank Holder for Method 1 and Method 2 for The 9% Incentive Level, HR: Human Resources, IT: Information Technology

Table 4 below illustrates the performance of the two models linked to performance rewards. Overall there are no significant differences between the two models on the number of employees who were rewarded for performances. There were differences within the business units in particularly Model 1 were biased towards the Purchasing, Finance Unit, and Finance, Manufacturing and the Information Technology department / unit. The table also revealed that M2 was biased towards Investigations and Production department/unit.

Business Unit	M1: % (n)	M2 : % (n)
Purchase	88 (7)	75 (6)**
Finance	100 (6)	50 (3)**
Human Resources	86 (6)	86 (6)
Information Technology	100 (6)	67 (4)**
Legal	100 (4)	100 (4)
Innovations	89 (8)	89 (8)
Production	63 (5)	100 (8)**
Investigation	50 (5)	80 (8)**
Manufacturing	88 (7)	75 (6)**
Retail sales	91(10)	91 (10)
Marketing	100 (7)	100 (7)
Overall	85 (71)	83 (70)

Table 4: Comparison Analysis of the Models Adjusting for All Employees Rewarded for Performance

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DISCUSSION

The purpose of this research was to review performance management system employed by Multnum Investments. The normalization of scores is the methodology that was employed at Multnum to compare scores of performance individuals belonging to different business units or functions. The first approach in the analysis was to test the data for adequate statistical distribution, in this case being the normal distribution. Outliers were identified and removed from the final analysis; reduced sample of 84 observations followed a normal distribution. The total sample used represented 93% of all employees which was representative. The study indicates performance improvement between the mid-year and end year evaluations. The current study also revealed that more than a third of the business units obtained average score higher than the average company performance score of 38.5.

The study showed that when adjusting for both average and above average performers, approximately 85 percent of the employees were considered based on Model 1 and 83 percent of the employees were considered based on Model 2. Performance analysis between the two models illustrates that more than two thirds of the employee's performance were linked to the reward system. There were also no significant differences at business unit level on the number of employees who qualified for performance rewards, thus the two models gave similar result on the overall. Thus the modification of Model 1 does not necessarily reduce bias. These results are not consistent with the findings of the study by Sarkar *et al* (2011), the author found that modification of the normalisation of scores reduced bias. However when adjusting for different performance incentive levels as well as business unit, the data showed that five of the eleven business units gave different results. Method 2 was more biased toward Innovations; however Method 1 was biased towards Retail sales marketing. In contrast Method 1 was biased towards Finance department. This particular finding was consistent with a study by Harbring *et al* (2010), the authors found that the introduction of forced distribution leads to short term performance increase.

It is important to note that the sample size of the study by Sarkar *et al* (2011) was bigger than in the current study. The current study revealed three business units that gave the same result for M1 and M2, and the sample size these units varied between 4-11 staff members. It is stated in literature that for the normalisation of scores system to have statistical validity there must be a fairly large number of employees in the pool (Stewart *et al*, 2010; Abelson, 2001). A sample size of 30 or more is considered appropriate, if fewer than that, then confidence in the predictive power of the bell curve begins to diminish sharply, according to the central limit theorem. For that reason, many companies with that are smaller size avoid force-fitting employees to bell curves.

The impact of size within the business unit also has an impact on supervises social preferences, for example in the current study, business unit that had a significantly small number of employees resulted in performance rate of 100 percent, this may be associated with the actual performance of the team within the unit, job complexity or to other factors such as the supervision effect which were not explored further in the current research. A study by Harbring *et al* (2010) found out that the supervisor social preferences on rating has a substantial impact in the rating behaviours, the author further noted that these social preferences are not picked up by the forced distribution. This finding further illustrates the need to consider other factors that introduce bias in performance management system. Lastly in the current study we noted that normalisation of scores was used across the organisation, Sterwart *et al* (2010) warns against this approach, in particular those that differ in size and job complexity might be difficult and maybe an unfair comparison. In the current research work we illustrated that modification of the normalisation of performance scores does not necessarily reduce bias, there are other alternative approaches to measure performance other than the Forced distribution, and Burger (2006) depicted

other possible alternatives. We recommend that further work be conducted on other alternative approaches that could results in an objective, transparent and fair performance appraisal process.

CONCLUSION

The current study illustrated that despite the controversies in methodological issues such as the use of normalization of scores, most organizations still implement this method. The current study revealed that modification of this model does not necessarily reduce bias. Thus the modification of the bell-curve such the model employed in the current study needs to also take into account some adjusting for factors such as supervisor/manager's effect which need to be properly accounted for when rewarding employees.

Complexity of the job and the size of the organisation inter-differences between business units remain a contributing factor, size effect of the business unit was also noted as a factor in the performance management system, thus size effect of the business unit also need to be adjusted for any incentive scheme, whether its motive is reward based or penalty based, will ultimately fail in its intended purpose of improving employees' overall performance.

Reward system for performance remain a key component of an integrated performance management processes. There are other components that are equally important for a sustainable effective performance management system. In the current study we did not conduct a comprehensive assessment of employees who underperformed, thus initiatives to enhance non-performers need to be explored further. In the current study we also did not conduct a comparison analysis on the six employees who were excluded due to non-comparability of the data, there are statistical methods that can be employed to deal with outliers, comprehensive analysis on the characteristics of the six identified outliers was beyond the scope of the current research.

Lastly alternative advanced statistics methods can also be employed as an alternative to normalization of performance scores. Methods such as linear mixed modelling approaches have been applied in annual performance evaluation have been run. These methods have been showed to reduce supervisor/manager baised effects which cannot be overlooked in any employees' performance appraisal.

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