



# A meta-analytical study on the association of human resource management practices with financial, market and operational performance



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**Purpose:** This article draws on the meta-analysis technique to systematically analyse and compare the association of human resource management (HRM) practices with financial, market and operational performance.

**Design/methodology/approach:** An exhaustive search of HRM-performance link resulted in a final sample ( $k$ ) of 24 independent studies. For this purpose, Comprehensive Meta-Analysis (Version 3.0) software was used. Heterogeneity of the studies was determined using Q-statistic with a  $p$ -value,  $I^2$ ,  $T^2$  and Tau. As the degree of heterogeneity was very high, random effects model was selected to estimate the mean of effects. Lastly, publication bias was studied using graphical and statistical methods.

**Findings/results:** The results revealed the average correlational ( $r$ ) association of HRM practices with financial performance, market performance and operational performance as 0.305, 0.434 and 0.311, respectively. More specifically, HRM practices have the strongest association with market performance.

**Practical implications:** The results statistically quantify the association between HRM practices and organisational performance measures for developing desired knowledge, skills and abilities to generate higher and improved performance. The results of this study provide HR managers with evidence that right investment in human resources does significantly contribute to the bottom line; they should make better and higher allocation of the resources for HRM.

**Originality/value:** To the best of our knowledge, this study is the first to meta-analytically examine the varying association of HRM with three distinct organisational performance measures.

**Keywords:** HRM; meta-analysis; comprehensive meta-analysis software; firm performance; financial performance; market performance; operational performance; HRM-firm performance link.

## Introduction

Starting in the 1990s, the first studies statistically analysed the linkage between human resource management (HRM) practices and organisation performance (Arthur, 1994; Becker & Gerhart, 1996; Becker & Huselid, 1998; Huselid, 1995; MacDuffie, 1995; Welbourne & Andrews, 1996). An increasing number of HRM scholars have attempted to establish that human resource practices (HRPs) lead to better organisation performance (Guest, 2011; Katou & Budhwar, 2007; Singh, 2004; Tzafir, 2005). Another argument is that the so-called high-performance work practices (HPWPs) in strategic HRM (SHRM) can improve organisation performance by developing employees' competencies, increasing their knowledge and commitment (Appelbaum, Bailey, Berg, & Kalleberg, 2000). High-performance work practices are a distinct but mutually related set of HRM policies and practices rather than isolated individual HRM practices (Becker & Huselid, 1998; Huselid, 1995). Even though the association is much discussed in the literature, there are certain issues that have remained untouched so far.

Meta-analysis can be described as a set of statistical procedures designed to collect research results across studies to estimate the relationship between variables in the population as a whole (Glass, 1997). Researchers are increasingly using meta-analysis to aggregate the results of empirical studies on key organisation outcomes, such as recruitment, selection, training and job

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attitudes (Stone & Rosopa, 2017). In the words of Stone and Rosopa (2017, p. 3), the following are the advantages of using meta-analysis:

- Results of meta-analysis can provide better estimates of the relation in the population than single studies.
- The precision and validity of estimates can be improved as more data are used in a meta-analysis, and the increased amount of data increases the statistical power to detect an effect.
- Inconsistencies in results across studies can be analysed, and the bases for these differences can be analysed (e.g. publication bias, differences in the representativeness of samples).
- Hypothesis testing can be applied on summary estimates.

Till date, meta-analysis on HRM and organisational behaviour has been conducted on the following topics: collective turnover (Hancock, Allen, & Soelberg, 2017), task performance (Chiaburu, Oh, Wang, & Stoverink, 2017), employee effectiveness (Mackay, Allen, & Landis, 2017), performance ratings (Harari & Rudolph, 2017), recruitment and job-choice (Kristof-Brown, Zimmerman, & Johnson, 2005) and longitudinal performance analysis (Saridakis, Lai, & Cooper, 2017). Some recent meta-analytical studies on HRM conveyed the results of its relationship with firm performance across the public, private and semi-public sector (e.g. Blom, Kruijen, Heijden, & Thiel, 2018). However, studies highlighting meta-analytical mechanism by applying objective measures for assessing the strength of HRM practices in various types of firm performance are still scarce. This study is an attempt to partially fill this gap. Given the widespread use of meta-analysis in the field, the goal of this study is to systematically analyse and compare the association of HRM practices with financial, market and operational performance using a meta-analytical approach. This article aims at contributing to the debate on diverse characteristics of HRM-performance link (Boselie, Dietz, & Boon, 2005; Guest, Paauwe, & Wright, 2012; Paauwe, 2009).

## Literature review

This section begins by highlighting the core issues surrounding HRM-performance link. Literature review is sub-divided under three perspectives: (1) financial performance, (2) market performance and (3) operational performance. It should be taken into consideration that there are no hard and fast criteria to categorise the organisational performance under these categories. However, three broad perspectives have been undertaken to avoid any potential overlap.

### Human resource management-performance link

Barney (1991) argues that any firm can procure technology, finance and information, whereas competitive advantage can be achieved only through unique contribution of human capital in the firm. The resource-based approach is directly linked with employee's skills and abilities and capabilities which together encompass the firm's pool of human capital

(Lado & Wilson, 1994). Pfeffer (1994) suggested 16 best practices for explaining HRM-performance linkage. It is reasoned that a greater use of these practices (training and development, participation and employment, information sharing and some others) would lead to improved productivity and profitability, thus helping organisations in achieving a competitive advantage (Darwish, Singh, & Mohamed, 2013). According to previous empirical research, the most common types of organisational performance measures are (1) financial or accounting performance, (2) market performance and (3) operational performance (Brealey, Myers, & Marcus, 2001; Carton & Hofer, 2006; Penman, 2001). Human resource practices influence HR-based outcomes, followed by financial, market and organisational outcomes. The rationale behind this proposition is that HRPs have a direct impact on employee behaviour, which increases job satisfaction, which in turn helps to generate high financial and organisational outcomes (Dyer & Reeves, 1995). Studies on HRM-performance link suggest that HR practices enhance organisation performance (Delaney & Huselid, 1996; Guerrero & Didier, 2004; Guest, 1997; Guest, Michie, Conway, & Sheehan, 2003; Lee, Lee, & Wu, 2010; Lee, Phan, & Chan, 2005; Panayotopoulou, Bourantas, & Papalexandris, 2003; Pfeffer, 1994; Richard & Johnson, 2001; Sels et al., 2006b; Zhang & Li, 2009).

### Human resource management and financial performance

Considering the association between HRM and financial performance measures, Venkatraman and Ramanujam (1986) emphasised the use of simple outcome-based indicators that are supposed to suggest the fulfilment of the economic goals of the firm. High financial performance has been associated with HRPs which may improve employee behaviour and attitude towards strengthening the competitive strategy of the firm (Hiltrop, 1996). High correlations have been observed between HRPs and profits amongst banks (Delery & Doty, 1996). Return on assets (ROA), sales growth and valuation of stocks have been linked with HR orientations and measured by effective recruitment and selection of workers and employees (Lam & White, 1998). Fitz-Enz (1997) identified three paradoxes about best HRM practices: (1) complex business problems have to be solved by employees and managers in the most simplistic manner, (2) considering a visible programme in a journal as best or general practice and (3) following the learnings of past studies for future directions. For instance, some HRPs may be related to financial performance whilst others may be related to staff earning (Lau & Ngo, 2004). According to Wright and McMahan (1992), the main concern was whether or how firms should benefit from their future source of profitability to achieve a firm competitive advantage. Rogers and Wright (1998) examined 29 studies that provided 80 effect sizes (i.e. described statistical relationships between HRM practices and performance measures) on the HRM-performance link surveying. Amongst the studies surveyed by Rogers and Wright (1998), a few had examined human resource outcomes, whereas several had used accounting and financial market

measures; the greatest number of effect sizes, however, was seen for organisational outcomes. Hence, we hypothesise that:

H1: HRM practices have strong association with financial performance.

### Human resource management and market performance

Data on market performance are most objective as they comprise of numbers and can be easily obtained even if the size of the investigation is large. On the contrary, whilst viewing the subjective side of HRM-market performance linkage, perceived market performance is utilised in cases where obtaining objective data is uncertain. Specific market performance indicators are market value, market share and revenue (Byremo, 2015). Zhang and Li (2009) studied the association between HPWPs and market performance in the Chinese pharmaceutical industry. Human resource practices, such as detailed job descriptions, performance appraisals, training and development programmes and profit-sharing, were found to be significantly associated with the company's perceived market results. Considering the criticism about accounting-based performance measures, several authors have proposed market-based performance measures (e.g. McGuire, Schneeweis, & Hill, 1986). Various studies have found a positive correlation between HRM practices and market performance measures (Azmi, 2010; Behery, 2011; Katou & Budhwar, 2010). Hence, we hypothesise that:

H2: HRM practices have strong association with market performance.

### Human resource management and operational performance

Ahmad and Schroeder (2003) studied the effectiveness of seven HRM practices suggested by Pfeffer (1998), focusing on measuring the effects of these practices on operations. The seven HRM practices include compensation/incentive contingent on performance, selective hiring, use of teams and decentralisation, employment security, status differences, extensive training and sharing information. Operational performance consists of cost, quality, flexibility, delivery and organisational commitment. Their study overall supported the relationship between the seven HRM practices and operational performance. Chang and Chen (2002) evaluated the relationship between HRM practices and firm performance of Taiwanese high-tech firms. It was found that HRM practices, such as teamwork, training and development, performance appraisal, human resource planning and employee benefits, have a significant effect on employee productivity. Human resource planning and benefits are negatively related to employee turnover. Huselid, Jackson and Schuler (1997) investigated the effect of HRM practices on firm performance of 293 US firms. They divided HRM effectiveness into two types. The first type was HRM effectiveness, which included recruitment and training, compensation, industrial/employee relations, appraisal, selection tests and employee attitudes. The second type was SHRM effectiveness that comprised teamwork, employee participation and empowerment, employee and manager communications and management

and executive development. Their study revealed that there was a positive association between SHRM effectiveness and firm performance. However, they found that technical HRM effectiveness was not related to firm performance. MacDuffie (1995) carried out research on 62 automotive assembly plants to recognise the effect of HRM bundles on operational performance and proposed that innovative HRM bundles affected operational performance.

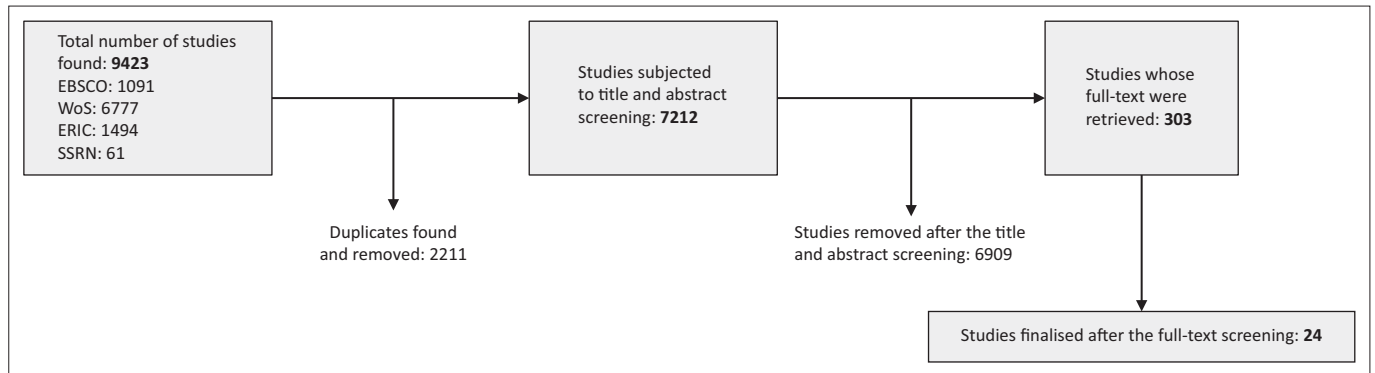
Three mediators through which HRM practices affect organisational performance function are (1) increasing employee's knowledge, skill and abilities (KSAs), (2) empowering employees to act and (3) motivating them (Becker & Huselid, 1998). These mediators affect employee discretionary effort, creativity and productivity (Becker, Huselid, Pickus, & Spratt, 1997). As a result, operating performance measures, such as job satisfaction and employee turnover (Dyer & Reeves, 1995), transform into improved accounting returns (Becker et al., 1997; Dyer & Reeves, 1995; Huselid, 1995). According to Dyer and Reeves (1995), HRM practices should affect operational performance such as productivity and retention more than financial measures such as accounting returns and growth. Despite the fact that HRM practices affect both operational and financial set of measures, operational performance measures are relatively closer to behavioural developments employees are expected to make. Improved financial results apart from HRM practices are caused by a wide variety of factors, such as acquisition or diversification activity (O'Shaughnessy & Flangan, 1998). This results in more variability in accounting returns, market returns and growth. Human resource management practices indicate a smaller portion of the above variability (Combs, Liu, Hall, & Ketchen, 2006). As a result, the relationship between HRM practices and operational performance measures like productivity and turnover should be stronger as compared to financial performance measures. Hence, we hypothesise that:

H3: HRM practices have strong association with operational performance.

## Method

### Search strategy

To identify potential studies that investigate the statistical association between HRM practices and organisational performance, empirical studies were searched during April and May 2019. To identify relevant studies, empirical studies published from January 2000 to March 2019 were searched. As all studies were considered as potentially relevant, no limit was set on the search period. Databases from EBSCO, Web of Science (WoS), Education Research Information Center (ERIC) and Social Science Research Network (SSRN) were used for this purpose. Search strings included the following keywords: 'HRM', 'Human Resource', 'HR Practice', 'HR Policy', 'High Performance Work Practices', 'HPWP', 'Personnel Practices', 'Personnel Policies', 'Financial Performance', 'Market Performance' and 'Operational Performance'. In total, 9423 potentially



**FIGURE 1:** Identification of relevant studies. EBSCO, Elton B. Stephens Company; WoS, Web of Science; ERIC, Education Research Information Center; SSRN, Social Science Research Network.

useful studies were identified using these keywords. We have treated each association as independent. After applying the inclusion criteria, 24 studies (Bae, Chen, Wan, Lawler & Walumbwa, 2003; Beh & Loo, 2013; Björkman & Xiucheng, 2002; Chang & Huang, 2005; Chang & Xin, 2009; Chuang & Liao, 2010; Darwish et al., 2013; Ferguson & Reio, 2010; Fey, Björkman, and Pavlovskaya, 2000; Fu, Bosak, Flood & Ma, 2018; Gong, Green, Wu, Whitten & Medlin, 2006; Gurbuz & Mert, 2011; Katou, 2017; Li, Qin, Jiang, Zhang, & Gao, 2015; Ngo & Loi, 2008; Park, Mitsuhashi, & Björkman, 2003; Sels et al., 2006; Singh, 2003; Singh 2004; Wan, Ong, & Kok, 2002; Wei & Lau, 2008; Wei & Lau, 2010; Wright, Gardner, & Moynihan, 2003; Zhang & Morris, 2014) were selected. Figure 1 shows the search and selection criteria for relevant studies. In addition, several papers (Arthur, 1994; Becker & Gerhart, 1996; Becker & Huselid, 1998; Guest, Michie, Sheehan, & Conway, 2000; Guest et al., 2012; Huselid, 1995; Welbourne & Andrews, 2014) on the association between HRM and organisational performance were also studied to advance our knowledge about this relationship. However, these papers were eventually not included in the meta-analysis.

### Inclusion criteria

Only those studies which met the following inclusion criteria were included in our meta-analysis. Firstly, only studies published in English were included. Secondly, only journals/academic journals were searched for necessary studies. Thirdly, only studies which provided correlations for the association between HRM and organisation performance were searched. However, no differentiation was made between studies using self-rated or any other measure for understanding this linkage. Finally, only studies that provide necessary statistical information (sample size and correlation coefficient) needed to perform the meta-analysis were included.

### Meta-analysis technique

Hak, Van Rhee and Suurmond (2018) suggest meta-analysis as a systematic technique for synthesising quantitative results of different empirical studies regarding the effect of an independent variable on a defined outcome. The meta-analysis was done using Comprehensive Meta-Analysis

(Version 3.0) software developed by Biostat. Borenstein, Cooper, Hedges and Valentine (2009) suggested that the estimates of correlation parameter  $p$  are mere sample correlation coefficient,  $r$ . The variance of  $r$  is approximately

$$v_r = \frac{(1-r^2)^2}{n-1} \quad [\text{Eqn 1}]$$

where  $n$  is the sample size, as shown in Equation 1.

Generally, synthesis on the correlation coefficient is avoided because the variance strongly depends on the correlation. When studies report correlation values, the values of the correlation are themselves used as effect size. The correlation values are converted into Fisher's  $z$  scale, and all the analyses are done using converted values (see Eqn 2).

The transformation from correlation to Fisher's  $z$  is

$$\text{Fisher's } z = 0.5 \times \text{Log} \left( \frac{1 + \text{Correlation}}{1 - \text{Correlation}} \right) \quad [\text{Eqn 2}]$$

Another key aspect is to determine the degree of homogeneity of the studies included in the meta-analysis. It helps in determining the statistical model to be used (Mills, 2009). Population estimates are better for effect sizes based on larger samples than those based on smaller samples (Lipsey & Wilson, 2001). According to Hak et al. (2018), heterogeneity of the studies is determined by the following:  $Q$ -statistic with a  $p$ -value,  $I^2$ ,  $T^2$  and Tau. The  $Q$ -statistic (also known as Cochran's  $Q$ ) gives the measure of variation around the average but not heterogeneity. It is estimated to study whether the variability across effect sizes is greater than expected from sampling error alone.  $I^2$  is a relative measure for the proportion observed variance that suggests real differences in the effect size. If  $I^2$  is low, the degree of homogeneity is high amongst the selected studies. However, higher  $I^2$  suggests that selected studies cannot be considered as belonging to the same population. Value of  $I^2$ -statistic with 0% implies no heterogeneity, 50% implies moderate heterogeneity and 75% or more implies high heterogeneity (Higgins, Thompson, Deeks, & Altman, 2003). As  $I^2$  is more than 95% in the studies used for meta-analysis here, it cannot be considered as studies belonging to the same population. Together,  $T^2$  and Tau are measures of dispersion of true effect sizes between studies in terms of the effect size. Tau is an

estimate of the standard deviation of the distribution of true effect sizes, whereas  $T^2$  is an estimate of the variance of true effect sizes (Hak et al., 2018).

When the mean effect size is homogenous (i.e. nonsignificant  $Q$ -statistic), it indicates that the dispersion of the effect sizes around the mean is less than or equal to the sampling error. Under this condition, the fixed effects model is used. However, when the effect size is heterogeneous (i.e. significant  $Q$ -statistic), the random effects model is used (Shelby & Vaske, 2008). Fixed effects model assumes that there is one true size which is shared by the studies included for meta-analysis, whereas random effects model assumes that the true effect size varies from study to study.

According to Berkeljon and Baldwin (2014), random effects models make statistical inferences about the population of studies which are not included in the meta-analysis. After observing the degree of homogeneity, random effects model was selected to estimate the mean of effects. It avoids the underestimation of weights of a small study or overestimation of the weight of a large study (Borenstein et al., 2009).

Lastly, the set of studies selected for meta-analysis is likely to be biased in many ways. Publication bias refers to the tendency of taking studies with significant studies. The field of publication bias has been broader than estimated. Following are some forms of publication bias categories: reporting bias, language bias, database bias, prestige bias and redundant publication bias (Rothstein, Sutton, & Borenstein, 2005). The main purpose of analysing publication bias is to analyse the potential publication bias in selected studies (Hak et al., 2018). Funnel plot is one of the most common mechanisms for showing the relationship between study size and effect size. Apart from funnel plot, there are certain statistical analysis techniques which reveal publication bias in meta-analytical investigation: (1) classic fail-safe  $N$ , (2) Begg and Mazumdar rank correlation, (3) Duval and Tweedie's trim and fill method and (4) Egger's regression intercept (Borenstein, Hedges, Higgins, & Rothstein, 2011).

## Results

Weighted average association between HRM practices and organisational performance measures is estimated with the random effects model in Table 1. To judge the magnitude of product-moment correlation coefficient effect size, correlation effect size values are considered small if less than or equal to 0.10, medium, if equal to 0.25 and large, if greater than or equal to 0.40 (Lipsey & Wilson, 2001).

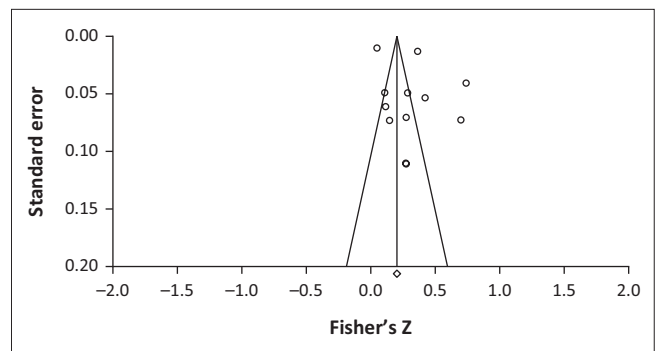
**TABLE 1:** Meta-analysis results.

Hypothesis	$N$	$k$	$r$	$z$	95% CI (under random effects model)	$Q_{within}$	$I^2$	$T$	$T^2$	$p$
H1: Financial performance	17 559	12	0.305	4.483	0.175–0.424	609.538	98.195	0.234	0.055	< 0.05
H2: Market performance	5745	16	0.434	3.139	0.173–0.638	1626.352	99.078	0.587	0.344	< 0.05
H3: Operational performance	7346	6	0.311	2.030	0.011–0.559	415.542	98.797	0.380	0.145	< 0.05

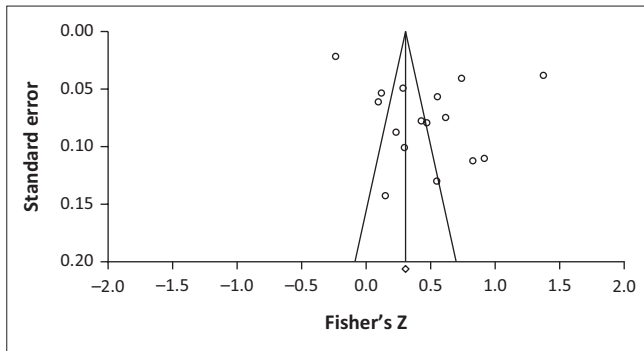
$N$ , total sample size;  $k$ , number of studies in meta-analysis;  $r$ , average weighted correlation coefficient; 95% CI, lower and upper limits of 95% confidence interval.

Answering to H1, 17 559 respondents and 12 independent studies gave an average correlation of 0.305 (95% confidence interval [CI] = 0.175 to 0.424). Visual inspection revealed that the funnel plot is relatively symmetric (see Figure 2). As the funnel plot is largely subjective, various statistical tests have been performed. The classic fail-safe  $N$  indicated that 2037 missing studies were needed to bring the  $p$ -value above the  $\alpha$  level ( $\alpha = 0.05$ ). Following Duval and Tweedie's trim and fill method, no missing studies were located to the left of the mean. However, two missing studies were found to the right of the mean. This changed the point estimate from 0.315 to 0.364 (95% CI = 0.177 to 0.452 to 95% CI = 0.194 to 0.535). Egger's regression test showed that the intercept varied from zero ( $B_0 = 3.749$ ; 95% CI =  $-2.983$  to  $10.483$ ;  $p$ (one-tailed) = 0.122;  $p$  [two-tailed] = 0.243), thus indicating asymmetry in the included studies. The average correlation for association between HRM practices and financial performance (0.305) is lower than the average correlation for association between HRM practices and market performance (0.434). However, it is also lower than the average correlation for association between HRM practices and operational performance (0.311). Therefore, H1 is rejected.

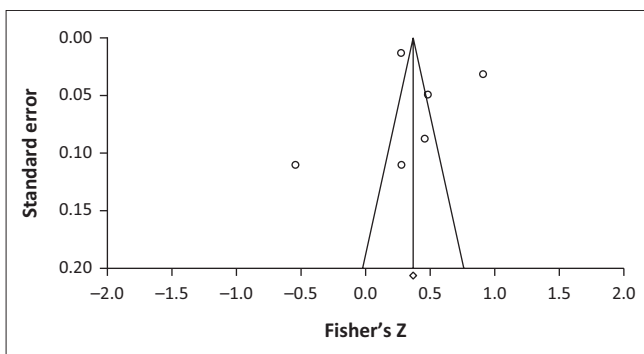
Answering to H2, 5745 respondents and 16 independent studies provided an average correlation of 0.434 (95% CI = 0.173–0.638). Visual inspection revealed that the funnel plot is considerably asymmetric. The direction of the effect is towards the right, thereby creating a gap on left, where the nonsignificant studies would have been if they had been located (see Figure 3). The classic fail-safe  $N$  suggested that 3075 missing studies were needed to raise the  $p$ -value above the arbitrary  $\alpha$  level ( $\alpha = 0.05$ ). Duval and Tweedie's trim and fill method showed no missing studies to the left of the mean. However, two missing studies were found to the right of the mean. This shifted the point estimate from 0.465



**FIGURE 2:** Funnel plot depicting publication bias for the association between human resource management and financial performance.



**FIGURE 3:** Funnel plot depicting publication bias for the association between human resource management and market performance.



**FIGURE 4:** Funnel plot depicting publication bias for the association between human resource management and operational performance.

to 0.543 (95% CI = 0.175 to 0.756 to 95% CI = 0.222 to 0.863). Egger's regression test showed that the intercept varied from zero ( $B_0 = 7.283$ ; 95% CI =  $-3.522$  to  $18.089$ ;  $p$  [one-tailed] =  $0.085$ ;  $p$  [two-tailed] =  $0.170$ ), thus signifying asymmetry in the selected studies. The average correlation for the association between HRM practices and market performance (0.434) was higher than the average correlation for the association between HRM practices and financial performance (0.305). It was also higher than the average correlation for the association between HRM practices and operational performance (0.311). Therefore, H2 is fully supported.

Answering to H3, 7346 respondents and six independent studies gave an average correlation of 0.311 (95% CI = 0.011–0.559). The funnel plot revealed studies as almost equal distribution around the mean (see Figure 4). The classic fail-safe  $N$  suggested that 1001 missing studies were needed to bring the  $p$ -value above the  $\alpha$  level ( $\alpha = 0.05$ ). Duval and Tweedie's trim and fill method found two missing studies to the left of the mean. However, no missing studies were found to the right of the mean. This shifted the point estimate from 0.321 to 0.124 (95% CI = 0.011 to 0.638 to 95% CI =  $-0.254$  to 0.503). Egger's regression test showed that the intercept varied from zero ( $B_0 = 1.716$ ; 95% CI =  $-15.449$  to  $18.881$ ;  $p$  [one-tailed] =  $0.398$ ;  $p$  [two-tailed] =  $0.795$ ), thus signifying asymmetry in the selected studies. The average correlation for the association between HRM practices and operational performance (0.311) was higher than the average correlation for the association between HRM practices and financial

performance (0.305). However, it was lower than the average correlation for the association between HRM practices and market performance (0.434). Therefore, H3 is partially supported. H1 and H3 predict that HRM practices have a moderately strong association with financial performance ( $r = 0.35$ ) and with operational performance ( $r = 0.311$ ), respectively. H2 predicts that HRM practices have a strong impact market performance ( $r = 0.434$ ). Most importantly, the difference is significant ( $p < 0.05$ ), suggesting that the effect of HRM practices on financial, market and operational performance measures is statistically significant. Our findings show that HRM practices positively affect organisational performance measures and thus largely influence market performance.

## Discussion

The goal of this meta-analysis was to analyse and compare the association between HRM practices and financial, market and operational performance. To the best of our knowledge, this work is first to meta-analytically examine the varying association of HRM with three organisational performance measures, thereby contributing to the debates on the importance of context for HRM-performance linkage (Pauwe, 2009; Vermeeren, 2014). In contrast to what we expected, there seems only a small difference between the association of HRM with financial and operational performance measures. As all relevant studies were included for initial search, there is a variety of issues like goal ambiguity, personnel constraints and cultural context in which those studies were conducted.

Our study does not specify the HRM practices which affect the organisational performance; it simply studies the correlation between HRM practices and various performance measures. Traditionally, financial performance measures were the first choice of academicians for analysing the effect of HRM practices on organisational performance (MacDuffie & Kochan, 1995; Uysal, 2008). This is evident as more than 55% studies of the sample population are on HRM-organisational financial performance linkage. However, with the changing business scenario, the emphasis has shifted to market performance. Market performance matches the external business environment with important financial areas in the organisation, thus providing a roadmap for an efficient utilisation of the corporate resources (Çetin & Oğuz, 2010). This change is strongly supported by statistical results as the highest correlation ( $r = 0.434$ ) is observed between HRM-market performance. The findings of the study extend the applicability of SHRM and work as an evidence for the adoption of HRM practices for improving market performance. The results support a universal context for the applicability of HRM practices in improving firm performance, especially market performance relationship (Guest, 1997). There are many ways to understand the association of HRM practices on firm performance, however adopting meta-analytical procedure provides robust estimate by aggregating information leading to an accurate statistical power. Each

organisation must review its strategies, goals, objectives and operations because changes in HRM policies and practices influence organisational performance. In addition to the main results, this meta-analysis has two noteworthy findings. First, the results, at least statistically, quantify the association between HRM practices and organisational performance measures for developing desired knowledge, skills and abilities to generate higher and improved performance. Second, the results of this study provide HR managers with evidence that right investment in human resources does significantly contribute to the bottom line; they should make better and higher allocation of the resources for HRM.

## Conclusion

In addition to the main results, this meta-analysis has two noteworthy findings. Firstly, the results, at least statistically, quantify the association between HRM practices and organisational performance measures for developing desired knowledge, skills and abilities to generate higher and improved performance. Secondly, the results of this study provide HR managers with evidence that right investment in human resources does significantly contribute to the bottom line; they should make better and higher allocation of the resources for HRM.

Similar to other studies, this study has certain limitations which must be acknowledged. The search for the studies to be included for the current meta-analysis was restricted to academic journals/journals. Including grey literature might have offered more resources. A majority of the studies which measured the association between HRM practices and organisational performance used the same rate source. This could lead to common method bias which could overstate the correlational values. Future studies are encouraged to explain the choice of HRM practices considered in the individual studies as inclusion criteria. This will improve the reliability of results. Moderator analysis was not performed as it would further result in relatively fewer studies for the meta-analysis.

On lines of this research, future researchers are expected to examine and compare this association on sectoral context. Although not explicitly stated in the inclusion criteria, all studies selected for meta-analysis happen to be cross-sectional. This further limits our conclusions. Researchers are encouraged to include longitudinal study designs as well for high-quality research. Also, it would be worthwhile to adopt a qualitative or case study approach for the association between HRM practices and various organisational performance measures. This study would thus be supplemented with meta-synthesis and/or realist synthesis. In conclusion, this literature review helps in statistically highlighting the association between HRM practices and organisational performance. It has been noted that:

[T]he behaviour of large and complex aggregates... is not to be understood in terms of a simple extrapolation of the properties

of a few ... instead, at each level of complexity entirely new properties appear. (Anderson, 1972, p. 393)

Similarly, this study suggests that for different performance measures, HR managers should take a different approach. The aim of every organisation should be to efficiently deal with the complexities which come in the way of improving organisational performance.

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The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this research article.

### Authors' contributions

S.K. and G.K. contributed equally to this research article.

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### Ethical consideration

This article followed all ethical standards for research without direct contact with human or animal subjects.

### Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

### Disclaimer

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