

## **Direct Influence of Human Resource Management Practices on Financial Performance in Malaysian R&D Companies**

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*Since 1996, the R&D sector in Malaysia has received greater attention than before. Despite fiscal and non-fiscal incentives provided to support the growth of this sector, the level of R&D measured in terms of R&D outputs (i.e. number of patent) is still dismal which is mirrored in the overall performance of local R&D companies. Many studies have investigated factors which influence the performance of organizations. The present study attempts to examine the influence of HRM practices on financial performance of R&D firms. The data for the study were obtained from survey responses from 64 R&D companies. Results of EFA and CFA confirmed the 4 dimensions of HRM practices: participation, reward, training and development, and teamwork practices. Regression results showed participation and reward practices have positive and significant influence on financial performance while training and development practice has negative influence on financial performance. There is no significant relationship between teamwork practice and financial performance. Overall, the findings of the present study provide partial support of universalistic perspective.*

**Keywords:** Strategic human resource management, R&D companies, financial performance, universalistic perspective.

### **1. Introduction**

The increasing interest of strategic management scholars in examining the role of human resources as value added in the present knowledge based economy is evident from the growing number of studies (Batt, 2002; Bhatti & Qureshi, 2007; Chang & Chen, 2002; Delery & Doty, 1996; Ghebregiosgis & Karsten, 2006; Guest et al., 2003; Guthrie, 2001; Hoque, 1999; Huang, 1999; Huang & Lin, 2006; Khatri, 1999; Liao, 2004; Richard & Johnson, 2001; Wang & Horng, 2002; Wright, Gardner & Moynihan, 2003; Tzafirir, 2006). While these studies indicate the importance of and provide evidence about human resource practices in improving organizational performance through reduced employee turnover, increased productivity, improved innovation, systematic learning, emotional commitment and superior financial performance, the R&D sector has not been a popular setting for these studies. Given that R&D industry is different from the manufacturing sector, understanding how HRM practices influence organisational performance will expand the boundary conditions of the HRM-performance theory. Therefore this study aims to examine the direct effects of the aforesaid relationship.

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This understanding will be particularly helpful in the case of Malaysia to invigorate the R&D sector. Since 1996, various macro-economic incentives were provided to R&D companies but the results are less than satisfactory. It is therefore, important and also timely that firm level practices especially HRM practices be examined to ensure that the fiscal and non-fiscal incentives are exploited by R&D firms to produce higher level of output.

Most previous evidence suggests that a firm's HRM practices are related to positive performance outcomes and higher financial success. However, many of these researches have examined the relationship between HRM practices and organizational performance for firms in manufacturing and service industries or in western context (Ahmad & Schroeder, 2003; Bae & Lawler, 2000; Collins & Smith, 2006; Faems, Sels, Winnie & Maes, 2005; Ghebrejosgis & Karsten, 2007; Katou & Budhwar, 2009; Richard & Johnson, 2001; Tzafrir, 2006). This raises a couple of important questions: first, whether or not SHRM practices affect firm performance in other industries or countries; second, if there are, which of these practices that have positive effect on the performance of R&D firms in Malaysia, given previous findings show mixed results on such relationship.

This study contributes to the SHRM literature by investigating the influence of SHRM practices on performance in R&D settings in Malaysia. As mentioned previously, majority of the studies examine the SHRM – performance relationship have been basically conducted either in non R&D sector or in the United States. Therefore, the findings of this study provide external empirical validation for the application of such relationship not only in the R&D setting but also specific to Malaysian context which differ from the manufacturing and service sector or Anglo-American environment.

In the following sections, a review of the existing literature related to SHRM practices and firm performance is presented. Then, the research methodology employed in the conduct of this study is described. Next, the research findings are examined, interpreted and reported. Finally, a brief review of findings in relation to research question to be answered, limitations and suggestions for future research are offered.

## **2. Literature Review**

As noted by Treen (2001) R&D professionals work with uncertainty, risk, change, and job ambiguity. Badawy (2007) posits that competent technical employees are hard to find and replace, thus, not only attracting them but also retaining these people is a great challenge in R&D companies. Motivating them is another big challenge given that different technical employees are inspired by different types of rewards and career paths (Kim, 1997; Manolopoulos, 2006; and Snape & Snape, 2006). The success of R&D firm depends heavily on its ability to foster creativity among its people and generate competitive innovation (Huang & Lin, 2006). Previous studies in relation to the management of R&D professionals have mainly focused on reward, training and development, teamwork and participation practices

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### ***Reward***

The term reward or generally known as compensation refers to remuneration, pay, and/or incentives used to motivate employees. Through pay system firms can attract, retain and motivate competent employees to perform in ways that support organizational objectives (Gomez-Mejia, Balkin, & Cardin, 2004; Risher, 2000). For k-workers, Scarbrough (2003) argued that the reward system plays important role in motivating them to acquire and exchange knowledge at work place. However, not all types of employees can be motivated by the same rewards. Some R&D professionals are motivated by intrinsic rewards such as opportunity to do high quality and curiosity driven research (Snape & Snape, 2006), freedom to work in one's own way (Chen, Ford and Farris, 1999), and recognition as appropriate response for encouraging creativity and research engagement (Hebda, Vojak, Griffin, & Price, 2007). A study by Kochanski and Ledford (2001) indicated that feedback from supervisor, the amount of job responsibility and skills variety needed for the job are the most important factors in retention. Meanwhile, other R&D professionals are found to be more motivated by extrinsic rewards such as salary and bonus (Ghebregiosgis & Karsten, 2007; Lee, Wong & Chong, 2005; Manolopoulos, 2006). In other studies, performance improved when team or fixed rewards (Farris & Cordero, 2002; Jassawalla & Sashittal, 2003; Kim & Oh, 2002) were offered. Consistent with the above studies, Chang and Chen (2002) confirmed that providing a comprehensive package that includes both financial and non-financial rewards helps to enhance high-tech firm performance in terms of employee productivity and also turnover. In summary, many of the studies have shown that providing rewards can increase technical employees' creativity (Amabile, 1998, Badawy, 2007), reduce employee turnover (Kochanski & Ledford, 2001) and facilitate firm to gain benefits (Cameron, Ford & Farris, 1999). However, there is also a study which has shown inconsistent finding with the previous studies i.e. Ahmad & Schroeder (2003).

### ***Training and Development***

Training and Development practice aims to prepare employees for future work responsibilities as well as to provide them with the knowledge, skills and abilities to perform their current jobs (Desimone et al., 2002). In R&D companies where technologies are rapidly changing, training is an essential means to continuously update employees' knowledge, skills and abilities (Tanner, 2003). Empirical studies have confirmed the positive effect of training on performance. For example, Wang and Horng (2002) found that creative problem solving training improved R&D professionals' creative thinking abilities and work performance. A study by Parboteeah, Hoegl and Styborski (2005) also produced similar results regarding the relationship between professional development programs particularly attending conferences and making customer contacts, and organizational success. Chang and Chen (2002) provide additional support for positive relation between training and development and firm performance. Garcia's (2005) study also shows similar positive impact of human capital development on employee satisfaction and business productivity. A study in a developing country suggests that employees are likely to remain in organizations when they have opportunities for promotion and development (Ghebregiosgis & Karsten, 2007). Studies have also shown negative or insignificant relationship between professional training and development and performance (Lee, Wong, & Chong, 2005;

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Faems et al., 2005; Parboteeah, Hoegl, & Styborski, 2005; Wright, McCormick, Sherman & McMahan, 1999).

### ***Teamwork***

Teamwork practices aim to encourage employees to work with more than one person in order to compensate the lack of knowledge and skills when they work alone. Proehl (1997) defines a team as a group of people with complementary skills dedicated to achieving a common purpose. Team members may consist of people from different disciplines/functional areas, organizations and/or geographical locations. According to Wing (2001), the diversity that individuals bring to the teams may open up incredible opportunities for creative potential. A number of researches have supported the positive effect of teamwork on performance. For example, Mudambi, Mudambi and Navarra (2007) find that teamwork had positive effect on knowledge creation measured in terms of patent citation in the Japanese Multinational Corporations R&D subsidiaries. Jassawalla, and Sashittal (2003) note that effective implementation of teamwork in product development process are expected to improve quality of the product as well as reduce time and cost of the production. A study by Hoegl and Gemuenden (2001) indicates good teamwork can enhance the success of innovative projects. Similarly, Spain (1996) suggests that R&D managers need to improve team work process if they were to improve quality in R&D. In an earlier study, Aram and Morgan (1976) demonstrate that the relationship between team collaboration among R&D scientists and individual technical performance is not direct. Instead, the relationship is intervened by opportunities to fulfill personal needs. Richard and Johnson (2001), however, find teamwork does not influence performance directly, but, through integration with business strategy.

### ***Participation***

Participation is defined as a process of allowing superiors' influence to be shared with individuals at lower levels (Wagner, 1994). Employee participation practice aims to get employee involved in goal setting, problem solving, or decision making by permitting greater autonomy and control over their work and workplace. It also gives a signal to the employee that their management place high level of trust on them (Tzafrir, 2005). Huang (1997) find that employee participation reduces negative behavioral outcomes such as turnover and absenteeism; and increases organizational effectiveness such as employee productivity and profitability. In Harel and Tzafrir's (1999) study, participation is reported to have positive correlation with both organizational performance and market performance of the Israelis firms. Amabile (1998) asserts that employees tend to produce more creative works when they perceive themselves to have options on how to perform their tasks. Chen and Huang (2007) mention that firms may encourage employees' involvement and participation in order to inspire and get them engaged in creative thinking and innovation. In a very recent study, Koski, Marengo and Makinen (2009) specify that small and medium high-tech firms in Finland which allow employees to participate in the firm's decision making tend to obtain more innovation output (patent filed) than either low-tech firms or large firms. Inconsistence with many findings, however, Faems et al.'s (2005) study indicates participation has no significant effect on either operational performance or financial performance. Similarly, Delery and Doty

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(1996) find that the relationship between participation and financial performance is not direct but moderated by firm strategy.

The foregoing review of the relationship between SHRM practices and performance suggests mixed results. As asserted by Ahmad and Shroeder (2003), HRM practices may vary by industries. Most of these studies have been carried out in manufacturing, banking and other services (Ahmad & Schroeder, 2003; Delery & Doty, 1996; Wang & Horng; Ghebregiosgis & Karsten, 2007; Faems, et al., 2005; Richard & Johnson, 2001; Tzafirir, 2006). There is little, if any, study on R & D firms about this relationship. Therefore, more studies need to be carried out to confirm on such relationship. Based on universalistic perspective, which has its roots in resource based view (RBV), some HR practices are consistently better than others, thus all organizations should adopt these practices in order to enhance performance (Delery & Doty, 1996; Terpstra & E. Rozell, 1993). Hence, the following hypothesis is posited.

*Compensation, development, teamwork and participation practices have positive influence on organizational performance.*

### **3. Methodology**

R&D activities have been recognized as an important engine for economic growth in this country under the 9<sup>th</sup> Malaysian Plan. R&D is an important process to explore and create new knowledge for creating innovation. Compared to other type of organization, human resource in R&D organization is critically important in determining the success of the organization. Given the competitive nature and growing importance of the industry in Malaysia, organizations need to continue their exploration of finding appropriate method to develop, motivate and retain their workforce. This industry is a good platform to provide further evidence to show the critical role of HRM in explaining firm performance; therefore, R&D organizations were employed as the sample of this study.

The companies were selected through a systematic sampling method from a list of R&D companies provided by the Companies Commission of Malaysia (2007). Each company was given two sets of questionnaires; one set to be completed by the HR manager while the other by the R&D manager. The number of surveys returned was sixty-four of the 178, representing a 36 percent overall response rate of those agreeing to be surveyed.

The independent variable (SHRM practices) was defined as people related practices employed by an organization to attract, deploy, develop and reward their R&D professionals. Respondents were asked to state how accurately the statements described their company's HRM practices. The measurement items for SHRM practices were drawn from the existing literature (Chen & Huang, 2009; Delery & Doty, 1996; Fey, Bjorkman & Pavlovskaya, 2000; Michie & Sheehan, 1999; Ramlall, 2003; Schuler & Jackson, 1987; Shih & Chiang, 2005). All together, the SHRM practices were measured using a 25 items with a seven-point Likert scale, ranging from 1 = "very inaccurate" to 7 = "very accurate".

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The dependent variable, financial performance is measured as profitability or return on sales (ROS). To compute ROS, earnings before taxes are divided by sales revenue generated by a financial period. The objective performance measure of profitability was considered to be a highly relevant indicator of firm performance in this study. First, it was used due to the availability of the data. Using available data is preferable as it may reduce bias resulted from using the same informant to respond on other variables in the study (Wall & Wood, 2005). Second, profitability measures improved internal efficiency and value added (Geroski & Machin, 1992). In this study, ROS is considered a good indicator of the extent to which R&D firms have been able to generate profits from sales in order to allow firms to fund further R&D activities later on.

In order to confirm the dimensionality of the *SHRM practices*, an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA) are carried out. For the measurement of the construct, items from various researchers are taken from prior studies. To suit the sector studied, some modifications of the items of the construct HRM practices have been done. EFA is used to redefine the theoretical construct according to the new established factors. A principal component factor analysis with varimax rotation is used to identify a set of factors that are uncorrelated with each other. Bartlett's test of sphericity for the construct displays levels of correlations indicating that a factor model is appropriate ( $p < .01$ ) (Hair et al., 2006). Furthermore, the construct exceeds the acceptable level (0.6) on the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy. Using SPSS v.14, the analysis produced four factors with eigenvalues greater than 1 and explained 77.49% of the variance. Table 1 shows the results of factor analysis of SHRM practices items.

The derived factor analyses are then validated to confirm on the underlying structures among the measured variables using CFA. Based on prior factor structures and loadings, ten items relating to HRM practices are submitted for examining measurement model validity as well as constructs validity using AMOS v.4. First, the measurement model is examined to determine how well the model fits the sample data. Following Hair et al. (2006), for a sample of less than 250 respondents and a total of 12 indicator variables, evidence of good fit at least include an insignificant  $\chi^2$  value, a comparative fit index (CFI) or Tucker-Lewis index (TLI) of at least .97 and root mean square error of approximation (RMSEA) of .08 or lower. As shown in table 1, four fit measures are used to evaluate the model fit:  $\chi^2$ , CFI, TLI, and RMSEA. Second, the construct validity of the instruments used in this study is assessed to ensure that the set of observed variables actually represents the theoretical latent construct these variables were designed to measure. Constructs are examined in terms of how well a construct converge or share a high proportion of variance in common (convergent validity) and is truly distinct from other constructs (discriminate validity) (Hair et al., 2006). Convergent validity in the present study was examined by observing the values of composite or construct reliability (CR) and variance extracted (VE). CR values should be at least 0.7 because CR value that is lower than 0.7 indicates that the items do not consistently measure the hypothesized latent factor. VE should be at least 0.5 and the value of VE smaller than 0.5 indicates that more error remains in the items than variance explained by the latent factor structure imposed on the measure. Discriminant validity was assessed by comparing the value of average variance

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extracted (AVE) and squared multiple correlations (SMC) between constructs. To assume that all exogenous variables were orthogonal of one another, the value of AVE should be greater than SMC between the respective constructs (Hair et al. 2006). Based on the analysis, the results show the model fits (Table 2) and displays construct validity (Table 3 and 4) thus, the measurement theory is supported.

**Table 1: Results of Factor Analysis of SHRM Practices Items**

Items	Factors			
	1	2	3	4
<b>Reward</b>				
This company offers group based incentives (e.g. gain-sharing, profit-sharing, stock option) to R&D staffs.	.072	.054	<u>.913</u>	.014
This company offers individual based incentives to R&D staff (e.g. commission for individual who brings in R&D project, cash bonus for individual who achieves work objectives).	.125	.027	<u>.907</u>	.094
<b>T&amp;D</b>				
This company provides extensive developmental programs to enhance R&D staff's competency for future needs.	-.076	<u>.787</u>	.012	.172
Currently, each R&D staff is required to attend training within his/her specialty.	-.024	<u>.872</u>	-.010	.163
Currently, each R&D staff is required to attend training beyond his/her specialty.	.083	<u>.817</u>	.090	-.080
<b>Participation</b>				
In this company, R&D staffs' voices are valued by the organization.	.015	.036	.067	<u>.878</u>
In this company, superiors keep open communications with R&D staff.	.192	.185	.038	<u>.826</u>
<b>Teamwork</b>				
In this company, R&D staffs are encouraged to work as a team.	<u>.797</u>	.083	.169	.202
Majority of the research projects done in this company require R&D staffs to work as a team.	<u>.888</u>	-.147	.087	.114
In this company, R&D staffs involve in formal and informal work teams.	<u>.921</u>	.043	.002	-.062
Eigenvalues	2.787	2.210	1.482	1.271
Percentage Variance Explained	27.87	22.10	14.82	12.71
Total Variance Explained	77.49			
KMO	.632			
Bartlett's test of Sphericity	228.89***			

Note: N=64. Underlined loadings indicate the inclusion of that item in the factor:

\*p<.10, \*\*p<.05, \*\*\*p<.01.

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**Table 2: Overall Fit of The model**

Model-fit index	Scores
$\chi^2$ (p-value)	0.642
CFI	1.000
TLI	1.026
RMSEA	0.000

**Table 3: Construct Validity - Convergent Validity**

Dimensions/Factors	Convergent Validity	
	CR > 0.7	VE > 0.5
Reward Practice	0.928	0.735
T&D Practice	0.902	0.563
Teamwork Practice	0.913	0.671
Participation Practice	0.961	0.579

**Table 3: Construct Validity – Discriminant Validity**

	TEAM	T&D	REW	PART
TEAM	1.00			
T&D	0.001 (0.003) <i>0.617</i>	1.00		
REW	.213 (0.044) <i>0.703</i>	.088 (0.003) <i>0.649</i>	1.00	
PART	.215 (0.057) <i>0.625</i>	.220 (0.093) <i>0.571</i>	.136 (0.027) <i>0.657</i>	1.00

Squared correlation values presented in parentheses and AVE values in *italics*

TEAM=Teamwork, T&D=Training and Development, REW=Reward, PART=Participation

Based on the EFA and CFA results, all SHRM practices (reward, T&D, teamwork and participation) were included for further analyses. The internal consistency of the HRM practices was then computed. Cronbach's Alpha for the factors were all, except for the "participation", above the suggested threshold of 0.7 (Hair et al., 2006; Cohen, 1992) of internal consistency. To determine the presence of multicollinearity among independent variables in this study, variance inflation factors (VIFs) were computed. The values of the VIF associated with the predictors show a range from 1.07 to 1.16, which falls within acceptable limits (Hair et al., 2006). This indicates that the measurements for independent variables have no multicollinearity.

### 4. Results

This study attempts to understand the relationships between SHRM practices and financial performance. Table 5 presents the means, standard deviations and correlations of all variables. Hierarchical regression analysis was conducted to assess the extent to which there is direct influence of HRM practices on organizational



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performance. The regression model was significant ( $p < .10$ ) with an  $R^2$  of 24%, which was not an insubstantial effect size Cohen (1992). This study found that two HRM practices, namely participation and reward were significantly and positively related to financial performance. Participation ( $\beta = .26, p < .05$ ) was found to be the strongest predictor of financial performance and followed by reward ( $\beta = .23, p < .10$ ). These findings suggest firms that place high importance or carry out participation and reward practices in managing their R&D professionals are more likely to experience better financial performance. A one unit increase in each participation and reward practices, other thing being constant, will increase profitability by 26% and 23%, respectively. Perversely, a one unit increase in development will suppress profitability by about 34% of the margin. There was no significant main effect for teamwork practices on profitability. Thus, the universalistic perspective of SHRM as submitted by Delery and Doty (1996) was modestly supported.

**Table 5: Correlations between SHRM Practices and Financial Performance**

Variables	Mean	S.D.	1	2	3	4	5
1. Teamwork	5.895	.636	-				
2. T&D	5.786	.525	.001	-			
3. Reward	5.765	.617	.213*	.088	-		
4. Participation	5.718	.478	.215*	.220*	.136	-	
5. Performance	0.022	.172	.191	-.247**	.261**	.248**	-

Note: N=64, \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table 6: Effect of SHRM Practices on Profitability**

Variables	$\beta$	$R^2$	F	P
<b>Step 1: Controls</b>		.022	.448	n.s
Age	-.188			
Small	-.056			
Medium	-.133			
<b>Step 2: HRM Practices</b>		.239	3.987	.006**
Reward	.231*			
T&D	-.340**			
Teamwork	.090			
Participation	.260**			

N = 64, \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

## 5. Discussions

HRM practices in this study referred to teamwork, development, reward and participation. The research question was whether each HRM practice positively related to financial performance. This study found that two HRM practices, namely participation and reward to be significantly and positively related to financial performance. These findings suggest that firms which placed high importance on or carry out participation and reward practices in managing their R&D professionals are more likely to experience better financial performance.

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Regarding participation practices, the findings from this study indicated that if the management of R&D firms valued employees' voices and keep open communications with staff, their firms tend to experience better financial performance. The findings of this study supported previous researches on the positive relationship between participation and organizational performance (Bhatti & Qureshi, 2007; Chen & Huang, 2007; Clarke's, 2002; Huang, 1997; Koski, Marengo & Makinen's, 2009; & Song & Parry's, 1993). Participation refers to a process of allowing superiors' influence to be shared with individuals at lower levels (Wagner, 1994). Participation allows greater capacity for employee to control their work (Harel & Tzafir, 1999). Practicing employee's participation can create a more supportive work environment whereby open communication between managers and subordinates would provide more opportunity for employees to voice out their opinions, share ideas and make decision regarding their works. Such supportive environment, according to Badawy (1988), is important to attract and retain the best technical people. The present findings supported Clarke's (2002) argument that scientists should be allowed to fully participate in performing their works. Scientists should have the freedom and autonomy to make operational decisions about their work and determine their research approach. By doing so, scientists can satisfy their psychological needs for achievements, respect and professional growth through working on R&D projects and hence, increase their satisfaction, motivation and job performance. Empirically, Bhatti and Qureshi (2007) found that participation had positive influence on job satisfaction, employee commitment, and employee productivity. In line with these studies, Chen and Huang (2007) posited that once employees have satisfied with their work and committed to their organization, they tend to exhibit proper role behaviors such as facilitating knowledge exchange, bringing in more new ideas to the organization, and engaging in creative thinking. Furthermore, Amabile (1998) claimed that if employees were given more freedom to decide on how to perform their work, they would become more creative. Supports for such claim could be observed in studies by Koski, Marengo and Makinen's (2009) and Song and Parry's (1993). Their studies had shown that adopting employee participation practices increased firm performance in terms of number of patents and new product success. The same conclusion was reached in Huang's (1997) study, who found participation through more responsibility in decision making and more autonomy in daily work allowed employees to recommend improvement in productivity, personnel concerns and working environment. This opportunity helped firm not only to reduce turnover and absenteeism but also increase employee productivity and profitability.

On reward practices, the result of this study indicated that reward practices positively influenced financial performance. Specifically, it showed that offering both group based as well as individual based incentives tend to increase financial performance of the firm. The present result was consistent with most of the previous studies which supported positive influence of reward practices on organizational performance (Ghebrejorgis & Karsten, 2005; Kim & Oh, 2002 Lee & Wong, 2006; & Manolopoulos, 2006). Through reward practices, firms can acquire competent R&D professionals and foster desired behaviors that can facilitate in achieving firm's objectives (Gomez Mejia, Balkin & Cardy, 2004; Jackson, Hitt & Denisi, 2003; & Risher, 2000). More importantly, the present results confirmed the need to provide a balance of different types of

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rewards to employees to allow positive behavioral outcomes to be realized and performance could then, be enhanced. Also, the current result seemed to agree with the previous claims “different R&D professionals prefer different rewards”. Previously, some studies had shown that some R&D professionals favored intrinsic rewards (Amabile, 1998; Badawy, 2007; Snape & Snape, 2006) while others desired extrinsic rewards (Ghebrejorgis, 2005; Manolopoulos, 2006; Lee & Wong, 2006; Kim & Oh, 2002). The present study indicated that extrinsic rewards namely individual based and group based incentives appeared to be most relevant. This could be a reflection of the work nature of R&D professionals in Malaysia. In other words, the current findings indicated that many of the respondents in this study were R&D professionals who involved in applied or commercial based research as compared to basic based research. This is not surprising as the samples of the study are private R&D firms. Private R&D firms focus more on applied research whereas basic research was more of public R&D institutes or universities central activities (Veugelers & Cassiman, 2005). Subsequently, as found in Kim & Oh’s (2002) study, R&D professionals who were in applied or commercial research fields preferred team based rewards whilst those who were in basic research favored fixed (or seniority) based rewards. According to them, the main concern of those in applied research was to produce a market oriented product. Producing such products involved integration from various functions and experts therefore; rewards based on team efforts were most appropriate and fair to compensate those in such a complex works. Individual rewards were also main aims for R&D professionals in the present study. This can be associated with motivational theory of Maslow (1943) which assumes good rewards can satisfy employee’s physiological, safety, social, esteem and self actualization needs.

The current result also indicated both team and individual based rewards preferred by R&D professionals in this study were financial type. This result was along the line of Manolopoulos’s (2006) findings which discovered that R&D professionals in Greece preferred to have extrinsic rewards namely economic rewards such as high salary, opportunity for advancement, annual bonus more than intrinsic rewards such as needs for competence and creative work. Similarly, a study in Singapore suggested providing rewards particularly extrinsic rewards to R&D professional with the right research attitudes could enhance their innovative outcomes (Lee & Wong, 2006). Also, Ghebrejorgis & Karsten (2006) argued that receiving a good payment was the main priority of employees in a developing country especially during times of economic crises.

Contrary to the expectation, training and development practices had significant but negative relationship with financial performance. This finding suggests that the more R&D firms emphasized on training and development practices particularly through providing extensive training programs to develop competency and requiring them to attend trainings within or beyond their specialties, the lower the firms’ tendency to improve financial performance. The result of this study contradicted some of the previous findings which stated that training and development practices had positive influence on firm performance (Chang & Chen, 2002; Garcia, 2005; Ghebrejorgis & Karsten, 2006; Wang & Horng, 2002). However, it was consistent with Wright et al. (1999) and Lee et al. (2005) studies which found employing training and development

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practices reduced firm performance. One plausible explanation could be due to the financial returns from the investment on training and development practices had not yet realized as it might take longer time to first improve individual performance and then enhance organizational performance, and finally translated into profitability (Wright et al., 1999). The other probable reason could be because of over an emphasis on training and development practices through facilitating R&D professionals with extensive programs might have actually disrupted them from focusing on their R&D tasks (Lee et al., 2005). Consequently, this resulted in lower individual performance and organizational performance. Allowing R&D professionals more autonomy to participate from beginning to end of their works would engage them to various possible challenges. This, in turn, would enhance their capability and creativity when they utilized their existing knowledge to create new knowledge or unique ideas in order to complete their tasks (Amabile, 1998). Conversely, providing various developmental programs often incurred high cost especially for technical trainings. When the high costs were not commensurate with high R&D outcomes, firm's profitability would suffer.

Another contradictory finding was observed in the relationship between teamwork and financial performance. The result showed that encouraging or requiring R&D professionals to work in teams did not have significant impact on financial performance. The finding of the present study was inconsistent with studies by Aram and Morgan (1976), Chang and Chen (2000), Hoegl and Gemuenden (2001), and Mudambi, et al., (2007) which supported a significant influence of teamwork practice on firm performance. The reason for this inconsistent finding could be due to the impact of teamwork on firm profitability might not be realized in a short time. Meaning that, the effect of teamwork practice would be initially observed in employees' outcomes, and later translated into organizational outcomes (Richard & Johnson, 2001). Another possible reason could be that the spirit of teamwork developed when employees are given autonomy to actively participate in performing their work. Thus, rather than employing teamwork as a formal practice which firms might have to bear extra costs i.e. for teamwork training, it would be much better for the firms to focus on practicing employee participation.

Overall, the present findings moderately support the positive effect of SHRM practices on financial performance as put forward in universalistic perspective. The results show participation and reward practices have positive and significant influence on financial performance while development practice has negative influence on financial performance. There is no significant relationship between teamwork practice and financial performance.

## **6. Conclusions**

Based on these findings, it can be concluded that this study has managed to find answers to its research questions which are: first, whether or not SHRM practices affect firm performance in other industries or countries; second, if there are, which of these practices are likely to enhance performance of R&D firms in Malaysia. In general, the results indicate HRM practices do have some effects on Malaysian firm bottom line performance. The competitive, progressive and equitable participation and

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compensation practices appear to be the primary mechanisms to drive behavior in R&D companies and thus are expected to affect performance positively. This study provides empirical validation for the relationship between HRM practices and firm performance in R&D setting – a context in which previous SHRM works have paid little attention. Also this study enriches the existing SHRM literature by adding more empirical evidence of the significant role of HRM in explaining firm performance in a non western context. Consequently, the results help researchers and practitioners in the SHRM field to better understand the nature of the relationship between HRM and financial performance in R&D industry in the country. Findings, however, are limited by the small sample size which might have resulted in non-significant finding (i.e. teamwork practice). Therefore, the generalization should be taken cautiously. Future research may involve a larger sample size. In addition, the use of single performance measure in this study, that is profitability, is likely to understate the potential impact of HRM practices on firm performance in fulfilling the divergent preferences of various stakeholders in the firm. Hence, future research should incorporate a more “balanced” view of company performance by considering various perspectives such as financial perspective, internal business perspective, innovation and learning perspective and customer perspective (Kaplan & Norton, 1993).

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