Chasing productivity demands, worker well-being, and firm performance

The moderating effects of HR support and flexible work arrangements

Received 19 January 2019
Revised 17 June 2019
3 December 2019
17 January 2020
Accepted 3 February 2020

Mastura Ab. Wahab
School of Management, Universiti Sains Malaysia, George Town, Malaysia, and
Ekrem Tatoglu
Department of Management, University of Sharjah, College of Business Administration, Sharjah, United Arab Emirates and School of Business, Ibn Haldun University, Istanbul, Turkey

Abstract

Purpose – This study aims to examine the impact of chasing productivity demands on worker well-being and firm performance in manufacturing firms in Malaysia. Flexible work arrangements and human resources support are used as moderators to mitigate the adverse impacts associated with chasing productivity demands.
Design/methodology/approach – Data were collected from 213 workers from manufacturing firms through a survey questionnaire utilizing structural equation modeling.
Findings – The findings of the study show that flexible work arrangements play a significant role in moderating the relationship between chasing productivity demands and well-being, and between chasing productivity demands and firm performance. The study also shows that flexible work arrangements are important to buffer the adverse effects of chasing productivity demands on worker well-being. In addition, flexible work arrangements strengthen the positive effect of worker well-being on firm performance.
Research limitations/implications – This study highlights the importance of flexible work arrangements in overcoming the negative impact of the relationship between chasing productivity demands and worker well-being and strengthening the positive impact of the relationship between worker well-being and firm performance.
Originality/value – This study has extended the variable of chasing productivity demands in the existing literature on the job demands–job control model, specifically in manufacturing firms.

Keywords Chasing productivity demands, Job demands, Job controls, Worker well-being, Firm performance, Flexible work arrangements, HR support, Malaysia

Paper type Research paper

Introduction

Drawing upon the theory of the job demands–job control (JD–JC) model by Karasek (1979), this study links the work intensification involved in chasing productivity demands to the literature advanced on job demands (JD). Manufacturing firms, which operate based on the supply and demand of their products (Bas *et al.*, 2017; Singla *et al.*, 2018; Yin *et al.*, 2018), allocate their production targets to workers to be fulfilled. It is common to find workers in manufacturing firms who work intensely for long hours with a heavy workload, work during weekends, do overtime work, and work on different shifts merely to fulfill the targets of firms' productivity demands (Boekhorst *et al.*, 2017). Adam Smith's principles of the division of labor are still widely practiced in most manufacturing firms, where workers are hired to do tasks that complement work performed by machines (Kim *et al.*, 2016). Heavy machinery and modern technology are used in manufacturing plants for the efficient production of outputs.

Personnel Review

0048-3486
DOI 10.1108/PR-01-2019-0026

In most circumstances, production workers must compete with machines to produce a large number of outputs in a fixed period. Working in manufacturing firms is also associated with doing monotonous job tasks, including sitting and standing for a long time; working with machines, which are prone to accidents; and working with conveyor belts and so forth, which can cause physical strain, fatigue, stress and overwork, an inability to enjoy everyday life activities, and musculoskeletal problems (Yu *et al.*, 2012). The unconducive work environment in manufacturing may also put workers at risk of different kinds of health impairments and deterioration of well-being (Friis, 2015; Mullane *et al.*, 2018).

Generally, human resources (HR) in manufacturing firms provide little support to workers, especially production workers, beyond the basic legal requirements (Au and Ahmed, 2016). Although previous studies (e.g. Kooij *et al.*, 2013; Kumar Mishra, 2014) have shown that support from superiors or an HR department can buffer the effect between the intensification of work and worker well-being, research on the role of HR departments in mitigating the negative effects of chasing productivity demands on worker well-being and firm performance, particularly in manufacturing firms, is still lacking. The role of HR in manufacturing firms is also still beyond the radar, and the effect of chasing productivity demands by workers to achieve firms' performance, thus far, has received insufficient attention in research. Although chasing productivity demands can be commonly found in almost every manufacturing firm, this area is still under-researched, maybe due to its insufficient measurement, which restricts the variable to be studied widely and more rigorously. Therefore, realizing the importance of chasing productivity demands for manufacturing workers to achieve their productivity targets and firm performance, an attempt has been made to develop a measurement for chasing productivity demands explicitly to be used in the manufacturing context. This is one of the key contributions of the study, as future research could use this measurement to improve the working conditions of workers chasing productivity demands, especially in manufacturing firms.

In addition, studies that focused on the HR roles in providing non-traditional work arrangements to production workers in manufacturing firms are hardly found, especially to help workers deal with negative effects associated with well-being caused by firms' urgent needs for workers to meet production targets (Lewis, 2014). Providing flexibility in the work arrangements to workers with problems related to the work schedules or to workers who experience issues related to their well-being may be beneficial to workers as well as to firms (Kotey, 2017). With flexibility in work, workers will feel empowered and more in control of their work-life (Hyatt and Coslor, 2018; Kossek and Michel, 2011). The importance of the manufacturing industry as a key driver of the economy of many countries, and in particular the role of chasing productivity demands in manufacturing firms to achieve firm performance, however, are creating adverse effects on workers' health and well-being. Therefore, concerns are rising to examine the moderating effects of HR support and flexible work arrangements in the relationship between the effect of chasing productivity demands on workers' well-being and firm performance.

This study first aims to validate whether worker well-being has a mediating effect on the relationship between chasing productivity demands and firm performance. Finally, drawing on the JD–JC model (Karasek, 1979), the study seeks to investigate the moderating effects of HR support and flexible work arrangements in mitigating the relationship between the negative effects associated with chasing the productivity demands and worker well-being as well as the relationship between worker well-being and firm performance.

Theoretical background and hypotheses

Job demands–job control model

In this study, chasing productivity demands is conceptualized as workers racing against the clock to perform strenuous JD to achieve the quality and quantity of outputs in a specified

time. Workers in manufacturing firms generally work under tight time limits and unfavorable working environments. Based on the theory of JD (Demerouti *et al.*, 2001), the acts of chasing productivity demands can lead to different kinds of negative consequences (Grover *et al.*, 2018; Messman *et al.*, 2017; Scheibe *et al.*, 2015). This research draws upon the theory of the JD–JC model by Karasek (1979). First, the theory proposed that high work demands in chasing productivity demands exerted by manufacturing workers to fulfill the set target output create pressure or strain, leading to harmful effects on worker well-being (Bakker and Demerouti, 2007). Added to low control and low support, workers exerting high effort in chasing productivity demands suffer many problems that affect their ability to perform (Moen *et al.*, 2016). Second, the JD–JC model also proposed that in situations of high JD, workers face pressure and heavy workloads. Therefore, providing workers with job control can stimulate them to get more engaged and empowered, which is helpful to counteract the negative effects associated with high JD (Chiang *et al.*, 2010; Day *et al.*, 2017). Kossek *et al.* (2011) postulated that high JD might still promote well-being if workers can control their work hours and if they perceive high support from the supervisors. According to Messmann *et al.* (2017), the adverse effects associated with fulfilling JD will infringe less if workers feel they have empowerment and flexibility in performing their tasks.

The relationship between chasing productivity demands and worker well-being

Based on the JD model, jobs that require high intensity and high effort can strain workers. This could lead to deteriorations in their well-being (Boekhorst *et al.*, 2017; Burke *et al.*, 2010). Well-being significantly influences the success of the organization, because happier and healthier employees can increase their efforts, contributions, and productivity (Huang *et al.*, 2016; Plomp *et al.*, 2016). According to Boxall and Macky (2014), high work involvement and work intensifications will normally cause workers to suffer from fatigue and health problems. They are also linked to lower job satisfaction and increased stress level (Wood and Michaelides, 2016). Deteriorations in worker well-being have been shown to reduce productive output if they cannot overcome the negative impact of problems related to well-being (Bryson *et al.*, 2017). This is particularly true in manufacturing firms because, in some cases, common work postures involve sitting and standing. Therefore, workers face a variety of occupational risks (Aziz *et al.*, 2013). Working hard, performing a repetitive task over long hours, may have negative consequences on worker well-being (Giunchi *et al.*, 2016).

The effect of chasing productivity demands on firm performance

Although the JD model has proposed that intense JD are likely to be associated with negative outcomes (Burke *et al.*, 2010), this research area is still nascent, and the empirical studies on the JD work outcomes have produced mixed findings (Boekhorst *et al.*, 2017; Burke *et al.*, 2010; Tadić *et al.*, 2015). Mostly, the negative effects of JD on work outcomes were related to the effect on health or well-being. Emotional exhaustion has also been positively associated with job strain, which directly contributes to work ineffectiveness (Fernet *et al.*, 2012). Exerting high work effort to meet JD can also have other adverse effects on employees, such as cynicism and reduced professional efficiency (Tadić *et al.*, 2015). Common negative effects of JD are related to well-being deterioration, such as burnout, which may result in an inability in employees to concentrate at work, thus diminishing their work engagement and quality of the work outcomes (Ko and Choi, 2019). However, putting high work effort to fulfill JD does not necessarily lead to negative outcomes (Steiber and Pichler, 2015). Ko and Choi (2019) stated that high workload and time pressure can still promote performance, especially if workers perceived JD as an opportunity for their career progressions, growth, or development. Burke *et al.* (2010) and Demerouti and Bakker (2011)

argued that effort-related activities in pursuing JD could lead to a positive experience that is important for workers' sense of achievement. Busch and Hoffman (2011) found that workers exerting efforts to finish the jobs assigned to them could actually lead to the achievement of organizational goals. Having a target for output performance to be accomplished can indirectly encourage manufacturing workers to energize their effort to achieve the production target and eventually increase firm performance. However, this can be argued for at least in the short term. In manufacturing firms, meeting production targets is critical for firm performance and growth (Pozzi and Schivardi, 2016). According to Sallinen and Kecklund (2010) and O'Mahony and Timmer (2009), among the common features of working in manufacturing firms are chasing productivity demands to fulfill productivity targets set by the firm, zero defects in the quality of the output produced, and willingness to do extra work, such as working long shifts and working during weekends to fulfill the organization's productions and productivity demands.

Nevertheless, these features are linked directly to firm performance. The ability of firms to produce the targeted output production determines their survival in the competitive manufacturing industry, pivotal for firms' competitive advantage amidst the uncertainty of global demands (de Sivatte *et al.*, 2015; Pozzi and Schivardi, 2016). The fulfillment of the production target outputs is the benchmark that determines the manufacturing firms' performance (Boekhorst *et al.*, 2017; Yin *et al.*, 2018).

The mediating effect of worker well-being

The literature on JD and work intensity is inconclusive about their relationships with work outcomes (Grover *et al.*, 2018; Scheibe *et al.*, 2015; Tadić *et al.*, 2015). Some studies show positive relationships between exerting great efforts such as in chasing productivity demands and performance, while other studies indicate negative consequences (Boekhorst *et al.*, 2017; Tadić *et al.*, 2015). These inconsistent findings suggest the possibility that more complex interactions and indirect effects exist in the relationships. Therefore, some researchers have suggested that adding mediating or moderating variables to the study would shed light on the likelihood of explaining the phenomenon (Boekhorst *et al.*, 2017).

Most previous studies, which argued in favor of negative consequences, relate workers who work in activities involving high JD to problems linked to well-being (Dicke *et al.*, 2018; Kattenbach and Fietze, 2018). In the literature, well-being was considered as an important predictor of employees' work outcomes and organizational performance (Plomp *et al.*, 2016). The deterioration in workers' well-being will affect their ability to concentrate at work and undermine their level of motivation, which will consequently affect their productivity and performance negatively (Huang *et al.*, 2016). In manufacturing firms, workers not only face mounting pressures to meet their productivity targets, but the working conditions also cause further degradation of their well-being (Lau *et al.*, 2018). Intense physical strain and high monotonous activities associated with chasing productivity demands to achieve output targets can reduce their well-being. Studies also have indicated that workers' well-being is crucial to ensure that organizational performance is accomplished (Harter *et al.*, 2003; Vakkayil *et al.*, 2017). Workers, who normally experience poor well-being in the workplace, are likely to be less productive, may produce low-quality outputs, and are prone to absenteeism. This can cause the overall performance of the firm to decrease (Danna and Griffin, 1999). Thus, worker well-being can act as a mediating factor that could affect the relationship between chasing productivity demands and firm performance. Therefore, the mediating effect of worker well-being can be hypothesized as follows:

H1. Worker well-being mediates the relationship between chasing productivity demands and firm performance.

The moderating effects of HR support and flexible work arrangements

HR support is organizational support that is important to boost workers' morale and satisfaction (Latorre *et al.*, 2016; Ogbonnaya *et al.*, 2017). The link between the activities of HR and improved employee and organizational performance outcomes has demonstrated that, in general, HR can lead to higher performance outcomes (Truss *et al.*, 2013) and better worker well-being (Huang *et al.*, 2016). In manufacturing firms, HR support is highly valued because the HR office is the first department that workers go to when they face an employment-related problem. In fact, most of the cases that lead to well-being-related problems occur in the workplace; and most of the cases have come from workers in the manufacturing industry (Hofmann *et al.*, 2017). Studies have found that if the HR office shows concern for the welfare of workers, the workers will reciprocate with a mutual and fair exchange by improving their efforts at work (Cook *et al.*, 2013). Thus, logically, by providing more support, firms' performance may improve, and the well-being of workers may also be strengthened. Thus, the moderating effects of HR support are stated in the following two-part hypotheses, respectively:

H2a. HR support moderates the relationship between chasing productivity demands and worker well-being, such that the negative effect of chasing productivity demands on worker well-being will be weaker when HR support is high.

H2b. HR support moderates the relationship between worker well-being and firm performance, such that the positive effect of worker well-being on firm performance will be stronger when HR support is high.

In manufacturing firms, most work activities involve high physical movement or work intensities that may not make workers resourceful. Therefore, allowing the workers to have some control over their job, such as allowing them some flexibility in their work arrangements, may help them overcome some problems related to JD. Flexible work arrangements would give more autonomy and flexibility to workers in performing their tasks and would enable them to cope with stress, fatigue, and other occupational problems (Hyatt and Coslor, 2018; de Sivatte *et al.*, 2015). Thus, flexible work arrangements are good for the well-being of workers. Some researchers (Barney and Elias, 2010; Berkery *et al.*, 2017; Coenen and Kok, 2014) also supported this notion, stating that flexible work arrangements were important for increasing worker performance and would benefit the organization. According to Giunchi *et al.* (2016), compared with other work arrangements, flexible work arrangements are seen as the answer to many employee problems related to high workload and repetitive tasks. Workers with job stress, working in shifts, and given high workloads also can benefit from flexible work arrangements. Flexible work arrangements such as telework, compressed workweeks, or flexitime can provide workers with the freedom to manage their work more effectively (Cañibano, 2019). This will lead not only to improved organizational performance but also to an increased level of worker satisfaction and well-being. Thus, by allowing more flexible work arrangements, firms' performance may improve, and the well-being of workers may also be enhanced. The moderating effect of flexible work arrangements was tested in the following hypotheses:

H3a. Flexible work arrangements moderate the relationship between chasing productivity demands and worker well-being, such that the negative relationship between chasing productivity demands and worker well-being will be weaker when flexible work arrangements are high.

H3b. Flexible work arrangements moderate the relationship between worker well-being and firm performance, such that the positive relationship between worker well-being and firm performance will be stronger when flexible work arrangements are high.

The research model, along with the hypothesized relationships, is shown in Figure 1.

Methodology

Sample and data collection

The study used the directory of the Federation of Malaysian Manufacturers (FMM) (2017) as the sampling frame for manufacturing firms. The directory provides a database of more than 2,600 manufacturing and service companies in Malaysia. Sample firms were drawn from three states (i.e. Penang, Perak, and Kedah) in the northern region of Malaysia. This region was selected as the survey setting because it has the greatest number of factories in Malaysia. Data for this study were collected from employees working in the electrical and electronics and the automotive and related equipment industries.

The G*power software was used to estimate the required minimum sample size for this study. For two independent variables and two dependent variables, and using an effect size of 0.12, the minimum sample size was calculated as 132 respondents. According to Sekaran (1992), the appropriate sample size for most research should be more than 30 but less than 500. Using a purposive sampling procedure, 500 questionnaires containing 43 items were distributed randomly to workers from well-established manufacturing firms. The number of questionnaires distributed to each firm varied with respect to the size of the firm. Prior to data collection, we first contacted the sample firms to obtain their approval for the survey, as some firms do not like their workers to be interrupted during work hours. Thus, we distributed the questionnaires through their representatives (e.g. a chief HR or corporate communications officer). We informed firm representatives of the confidentiality of the survey and requested them to distribute the questionnaires to the respondents randomly.

Altogether, 232 questionnaires were returned. The data were further filtered using the social desirability effect (SDE) test asked in the questionnaire. The respondents with high SDE test scores were removed to avoid the problem of common method bias (CMB). Nineteen

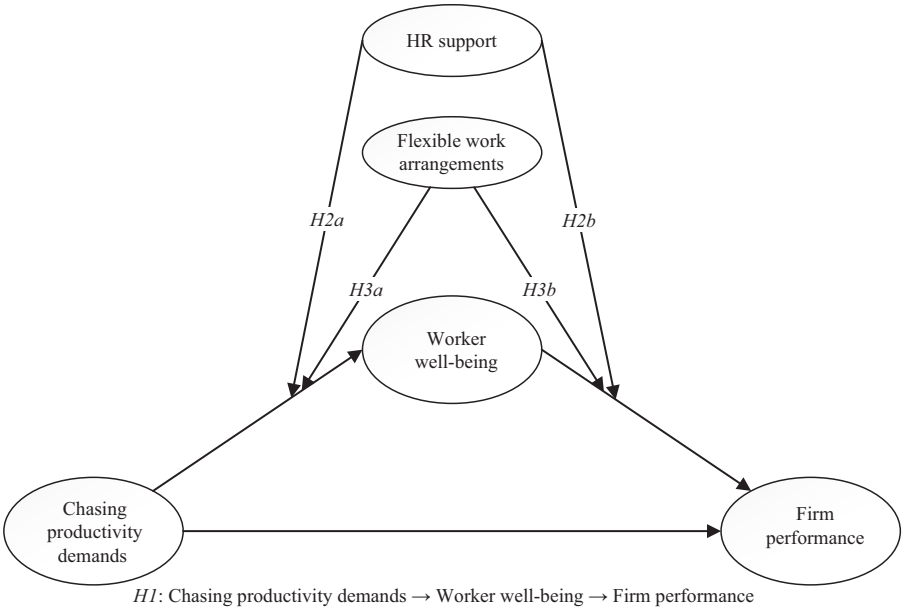


Figure 1.
Research model

cases were eliminated, leading to a final sample of 213 usable questionnaires, which represents an effective response rate of 46.4 percent. The characteristics of respondents are summarized in Table I.

Measurement of variables

All items used to measure the constructs in this study were adapted from previous studies, except for the items for chasing productivity demands.

Firm performance was treated as the dependent variable and was measured as described by Gates and Langevin (2010). In evaluating firm performance, respondents were asked to provide their subjective assessment of firms' performance in terms of sales and their product/service quality based on a seven-point Likert scale (1 = "strongly disagree" to 7 = "strongly agree").

Chasing productivity demands was developed for this study based on the scale used by Janssen (2000) to suit JD in manufacturing. The items assess several aspects associated with chasing productivity demands in manufacturing firms, such as working hard to achieve the productivity target, the quantity of output set for the day, and willingness to work extra time. The items measuring this construct were initially pretested on interns in manufacturing firms, and they indicated a satisfactory level of construct reliability (α = 0.77), as recommended by Nunnally and Bernstein (1994). The items were tested using a seven-point Likert scale (1 = "strongly disagree" to 7 = "strongly agree").

Worker well-being was drawn from the General Health Questionnaire (GHQ-12) (Bun Cheung, 2002) based on four original items. The concept was measured using a five-point scale (1 = "never" to 5 = "always"). Respondents were asked to indicate their feelings, ranging from the ability to concentrate and enjoy work activities, to feeling positive about oneself and the ability to make decisions.

Characteristics	*N*	%
Gender		
Male	184	86.4
Female	29	13.6
Age (years)		
18–24	68	31.9
25–34	95	44.6
35–44	27	12.7
45–54	21	9.9
55 and above	2	0.9
Employment status		
Full-time	197	92.5
Part-time	16	7.5
Labor category		
Blue-collar	144	67.6
White-collar	69	32.4
Firm size (employee number)		
Less than 100	40	18.8
100 and over	173	81.2
Firm industry		
Electrical and electronics	149	70.0
Automotive and related equipment	64	30.0

Table I. Characteristics of respondents

HR support was tested using items modified from Conner and Ulrich (1996). The participants were asked to indicate their level of agreement with each of the items using a seven-point Likert scale (1 = "strongly disagree" to 7 = "strongly agree"). This construct was used to ensure the assistance or support provided by HR during peak time and times of unexpected increases in business.

Flexible work arrangements were captured essentially using the items drawn from Allen (2001). Respondents were assessed on a variety of flexible work arrangements such as flexitime, a compressed workweek, telecommuting, and job sharing using a four-point scale (1 = "not offered and not needed," 2 = "not offered but I could use it," 3 = "offered but I did not use it," 4 = "offered and used it").

SDE was measured using 13 items adopted from Crowne and Marlowe (1960). The respondents were asked to indicate their level of agreement with the statement using a true-false scale format. Eight items (1, 2, 3, 4, 6, 8, 11, and 12) measured low SDE, while the remaining five items (5, 7, 9, 10, and 13) measured high SDE. Both the low and high measures were combined, with a low value indicating a low SDE, and vice versa.

Firm size and *industry* were used as control variables. *Firm size* was measured by a dichotomous variable, where 1 denotes firms with 100 employees or more, and 0 represents firms with fewer than 100 employees. *Firm industry* was also measured by a dichotomous variable, where 1 represents firms operating in the electrical and electronics industry, and 0 indicates the automotive and related equipment industry.

The measurement of the study constructs (along with the exact wording of the questions) and their sources are reproduced in the Table AI.

Common method bias

Many authors such as Chi *et al.* (2015) and Reynolds (1982) suggested the use of an SDE test to filter out the data affected by CMB. This is especially true for data that have dependent and independent variables collected from a single source such as data in this study, where the independent and dependent variables were collected from the self-report of manufacturing workers. In such cases, most likely, CMB may be present. Thus, testing the SDE items on the respondents would enable the data with CMB to be detected and removed. The result of the CMB test showed that all the constructs under study were correlated, and the insignificant relationships highlighted that the SDE is not a major concern with these data. Table II displays the descriptive statistics and correlations among the variables.

Analysis and results

This study utilizes a quantitative research method to empirically test the variables under study. This method was chosen because it could provide answers on the magnitude of problems regarding chasing productivity demands that affected workers in manufacturing firms objectively. Furthermore, it could also establish a cause-and-effect relationship between the variables (Johnson and Onwuegbuzie, 2004). The data were analyzed using structural equation modeling (SEM) of AMOS. SEM was chosen due to its benefits over other alternative techniques, such as multiple regressions (Byrne, 2001). SEM is useful to quantify theoretical relationships (Tabachnick and Fidell, 1996), and it allows all variables to be studied simultaneously, as compared to multiple regression and similar techniques (Hair *et al.*, 2014), thus reducing the impact of Type 1 error (Byrne, 2001), which is rejecting a true null hypothesis. SEM also provides validity and reliability measures as well as goodness-of-fit statistics, which are important for checking measurement errors and internal consistency of data error, thus generating more robust results (Hair *et al.*, 2014; Sarstedt *et al.*, 2016).

Measurement scale validation

A confirmatory factor analysis was performed to assess the model fit for all the constructs under study. The result showed a good model fit ($\chi^2 = 364.43$; degrees of freedom [df] = 155; $\chi^2/df = 2.35$; TLI = 0.86; CFI = 0.89; RMR = 0.07; and RMSEA = 0.08). Composite reliability (CR) and average variance extracted (AVE) were used to measure the convergent validity of the constructs. Most studies used 0.70 as the accepted value for CR (Bagozzi and Yi, 1988), and 0.50 for AVE (Fornell and Larcker, 1981). Table III presents the result of convergent validity.

To have good reliability and validity constructs, one validity measure that needs to be satisfied is discriminant validity. It determines whether each of the constructs is distinctive and measures different variables, independently from other variables under study. According to Hair *et al.* (2011), discriminant validity is achieved if the square root of AVE exceeds the correlation values of each variable under study. Table IV shows the result of correlation values for all constructs and that all of them are smaller than the square root of AVE. Thus, discriminant validity assessments showed that the constructs for this study fulfilled the discriminant validity criteria.

Testing the mediating relationship using a bootstrapping procedure

A bootstrapping procedure was performed to test the mediating effect of worker well-being on the relationship between chasing productivity demands and firm performance (*H1*). Bootstrapping is a good way to avoid issues associated with the direct and indirect effects of

Constructs	Mean	SD	3	4	5	6	7	8
1. Firm size	1.81	0.39						
2. Firm industry	1.30	0.45						
3. Firm performance	4.40	0.63	1					
4. Worker well-being	2.93	0.79	0.21*	1				
5. Chasing productivity demands	4.92	0.81	0.45*	−0.23*	1			
6. HR support	4.08	0.92	0.19*	−0.17	−0.22*	1		
7. Flexible work arrangements	1.48	0.67	0.27*	−0.29*	0.25*	0.36*	1	
8. Social desirability effect	0.50	0.14	0.10	0.07	0.01	0.05	0.00	1

Note(s): *$p < 0.01$

Table II. Descriptive statistics and correlations

Constructs	AVE	CR
1. Firm performance	0.49	0.74
2. Worker well-being	0.61	0.86
3. Chasing productivity demands	0.73	0.89
4. HR support	0.64	0.83
5. Flexible work arrangements	0.50	0.79

Note(s): AVE = average variance extracted; CR = composite reliability

Table III. Convergent validity

Constructs	1	2	3	4	5
1. Firm performance	*0.70*				
2. Worker well-being	0.01	*0.78*			
3. Chasing productivity demands	0.38	−0.17	*0.85*		
4. HR support	0.13	−0.12	0.02	*0.79*	
5. Flexible work arrangements	0.27	−0.11	0.13	0.46	*0.70*

Table IV. Discriminant validity

estimation. It could yield a more accurate estimation of mediating effects than that obtained by Baron and Kenny (1986) and by the Sobel (1982) test (Cha *et al.*, 2015). The results in Table V show that *H1* is partially supported in that there is a partial mediation effect of worker well-being on the relationship between chasing productivity demands and firm performance. This shows that although chasing productivity demands can have a positive direct effect on firm performance, it depends on its effect on the well-being of the workers such that workers with poor well-being may influence firm performance negatively.

Testing the moderating relationships using a multiple group analysis

Tables VI and VII show the results of the moderating effects of HR support and flexible work arrangements. In testing the moderating effects as in *H2a*, *H2b*, *H3a*, and *H3b*, a multiple group model was introduced in which the data set was divided into two groups. In each group, a fully constrained model and an unconstrained model were compared. In the unconstrained model, the paths were allowed to vary freely, while in the fully constrained model, the paths were constrained equally between both groups. A test of chi-square (χ^2) difference was then performed to check whether a significant difference exists between the fully constrained model and the unconstrained model by comparing the differences in the

Table V.
Results of mediating relationship

Hypothesis	Direct effect with mediator (x→m→y)	Direct effect without mediator (x→y)	Indirect effect	Result
H1: Chasing productivity demands → Worker well-being → Firm performance	0.43**	0.40**	−0.05*	Partially supported

Note(s): *$p < 0.05$; **$p < 0.01$

Table VI.
Results of moderating effects of HR support

Model	χ^2	df	χ^2/df	RMSEA	TLI	CFI	Invariant
Unconstrained	269.52	102	2.64	0.09	0.81	0.85	No
Fully constrained	297.69	114	2.61	0.09	0.81	0.84	
χ^2 difference/change	28.17	12					
p-value	0.005						

Path	χ^2 Thresholds	df	Invariant	Result
90% Confidence	≥272.23	103		
H2a:	270.54	103	Yes	
χ^2 difference/change	1.69	0		
p-value	>0.10			Not significant
H2b:	269.65	103	Yes	
χ^2 difference/change	2.58	0		
p-value	>0.10			Not significant

Hypothesized path		High HR support	Low HR support	Result
H2a:	Chasing productivity demands → Worker well-being	−0.08	−0.22	Not supported
H2b:	Worker well-being → Firm performance	0.30*	0.12	Not supported

Note(s): *$p < 0.01$

Model	χ^2	df	χ^2/df	RMSEA	TLI	CFI	Invariant
Unconstrained	223.24	82	2.72	0.09	0.82	0.86	No
Fully constrained	251.79	93	2.70	0.09	0.82	0.85	
χ^2 difference/Change	28.55	11					
p-value	0.003						

Path	χ2 Thresholds	df	Invariant	Result
90% Confidence	≥225.95	83		
H3a:	234.20	83		
χ^2 difference/Change	8.25	0		
p-value	<0.01		No	Significant
H3b:	226.83	83		
χ^2 difference/Change	0.88	0		
p-value	<0.10		No	Significant

Hypothesized path		High flexible work arrangement	Low flexible work arrangement	Result
H3a:	Chasing productivity demands → Worker well-being	−0.42*	0.03	Supported
H3b:	Worker well-being → Firm performance	0.46*	0.01	Supported

Note(s): *$p < 0.01$

Table VII. Results of moderating effects of flexible work arrangements

degrees of freedom and χ^2 values. If the comparison shows that a significant difference exists (i.e. $p < 0.05$) between the two models (the fully constrained model and the unconstrained model), then the next step is to check the χ^2 difference test on the paths of the moderated hypotheses. If the result shows a significant difference, then the hypothesis is supported.

Table VI displays the results for the moderating effects of *H2a* and *H2b*. The results from testing *H2a* show no significant difference between high HR support and low HR support. The beta values are also not significant (high HR support: $\beta = -0.08, p > 0.1$; low HR support: $\beta = -0.22, p > 0.1$); thus, *H2a* is not supported. The result for *H2b* also shows no significant difference between the unconstrained and the constrained models. Thus, *H2b* is not supported, although the beta value for high HR support is significant (high HR support: $\beta = 0.30, p < 0.01$; low HR support: $\beta = 0.12, p > 0.1$).

The same procedure was performed in testing *H3a* and *H3b*. The results show significant differences for both *H3a* and *H3b*. Under high flexible work arrangements, the moderating effect is stronger ($\beta = -0.42, p < 0.01$) than under low flexible work arrangements ($\beta = 0.03$, $p > 0.1$), thus confirming *H3a*. The result also shows that flexible work arrangements moderate the relationship between worker well-being and firm performance. Under high flexible work arrangements, the moderating effect ($\beta = 0.46, p < 0.01$) is stronger than under the case of low flexible work arrangements ($\beta = 0.01, p > 0.1$), thus confirming *H3b*.

The interaction coefficient between chasing productivity demands and worker well-being, as predicted in *H3a*, is significant, although small ($\beta = 0.08$, $p < 0.05$). The interaction indicates that the negative effect of worker chasing productivity demands on worker well-being is reduced when the HR provides more flexible work arrangements to the workers. Figure 2 shows the interaction effect of flexible work arrangements on the chasing productivity demands and worker well-being relationship.

The interaction coefficient between worker well-being and firm performance in *H3b* was also significant ($\beta = 0.07, p < 0.05$). The results show that the positive effect of worker well-being on firm performance is strengthened when HR provides more flexible work arrangements to their workers. Figure 3 shows the interaction effect of flexible work arrangements on worker well-being and firm performance.

As for the effects of the control variables, the results show that firm size has no significant relationship with worker well-being ($\beta = 0.15, p > 0.1$). However, it has a significant relationship with firm performance ($\beta = -0.22, p < 0.01$). This indicates that firm size does not have confounding effects on the relationships between chasing productivity demands and worker well-being, but in large firms, it has a stronger impact on firm performance compared with relatively small firms. In terms of firm industry, the results also show insignificant relationships between firm industry and worker well-being ($\beta = -0.04, p > 0.1$), and firm industry and firm performance ($\beta = -0.06, p > 0.1$). This indicates that the firm industry has no effect that could confound the relationship between chasing productivity demands and other variables under study, as specified in the hypotheses.

The results of the hypothesized relationships are delineated in Figure 4.

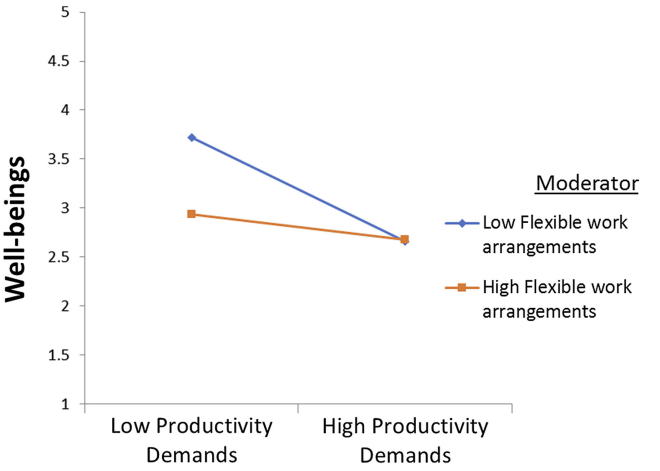


Figure 2.
Interaction of flexible work arrangements on the relationship between chasing productivity demands and worker well-being

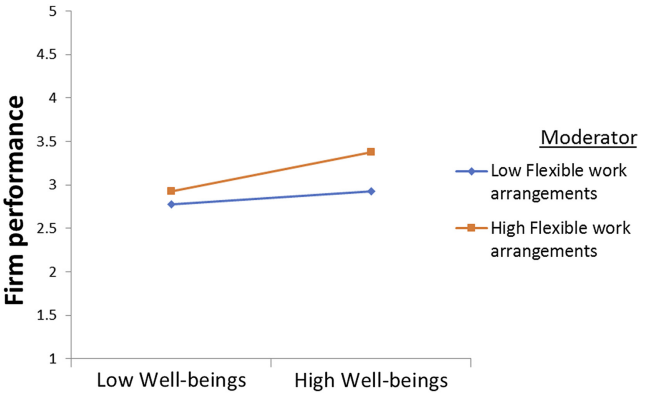
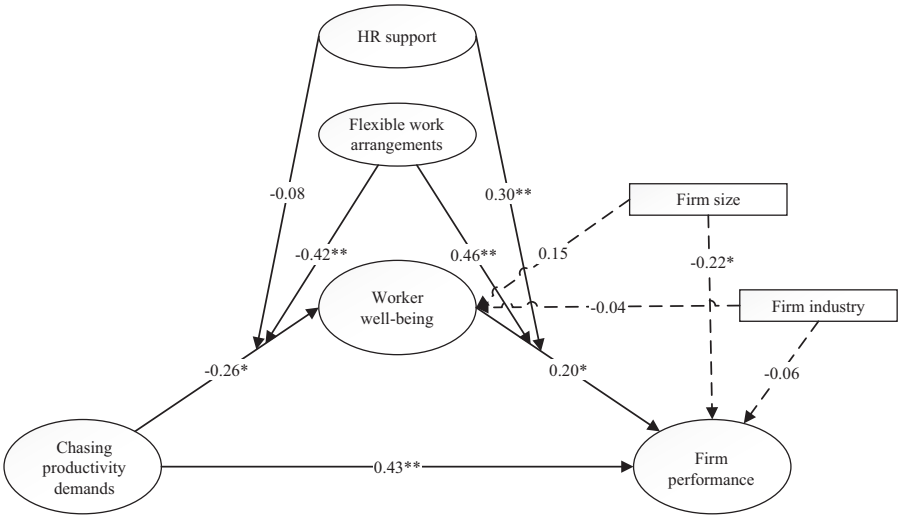


Figure 3.
Interaction of flexible work arrangements on the relationship between worker well-being and firm performance



Note(s): *p<0.05, **p<0.01

Figure 4.
Results of SEM model

Discussion and conclusion

The findings of this study show that the effect of chasing productivity demands on firm performance is partially mediated by worker well-being. This result provides evidence that chasing productivity demands does not entirely lead to firm performance. The positive effect of chasing productivity demands on firm performance is decreased with a decrease in worker well-being. The finding also revealed that worker well-being and firm performance would be enhanced when HR provides more flexible work arrangements to workers. The results of this study also indicated that the flexible work arrangements provided by HR could mitigate the adverse effects of well-being-related problems caused by chasing productivity demands on firm performance. Unfortunately, the use of flexible work arrangements for workers has not been fully implemented in manufacturing firms, especially among production workers, despite their being in the most affected positions in the manufacturing industry. In general, production workers in the manufacturing industry are not given enough support to use flexible work arrangements, except for a handful of those office staff and other white-collar positions (Andersen *et al.*, 2016). The most common excuses given were the machines and technologies used in the manufacturing plants are not suitable to allow the flexible work arrangements to be carried out (Stavrou, 2005). In addition, flexitime work schemes, such as starting work late and finishing work late, would interrupt the production flow of other workers such as technicians and other quality controllers, in case the machine breaks down. Therefore, it would require more technicians to support flexible work arrangements. Allowing workers to start their work at their convenient time may interrupt the production flow, and, in the long run, it might not be efficient for manufacturing firms, which have large output targets to meet and jobs that require high supervision within a specific time. This finding revealed that providing flexible work arrangements to workers in manufacturing would be a challenge for HR and may be difficult for them to control the vast number of workers with different needs of flexible work arrangements. However, it would help reduce many unsolved and unending problems facing most workers in manufacturing firms.

The study also tested the moderating effect of HR support to ascertain whether it could significantly help reduce the negative impact of well-being-related problems caused by chasing productivity demands. However, the study found no support. The reason may be because HR supports, such as providing assistance during peak time, bonuses, and rewards, are the roles that are already being played by most HR departments in manufacturing firms to help manufacturing workers deal with problems related to their well-being. It may also be that this insignificant result indicated that the current HR support could help workers ease their burdens only temporarily. It does not solve the problems faced by many workers in manufacturing firms. Since chasing productivity demands by workers to meet the target outputs has a negative effect on worker well-being, workers need moral support and additional commitment from the HR. Due to the strenuous jobs and high physical strain associated with working in manufacturing firms, providing assistance in terms of hiring more new workers by the HR may not be very effective to overcome the problems, as new workers may produce more product defects, thus slowing the unit phase in chasing productivity demands. Similarly, providing bonuses and rewards will not solve the problems in the long term, as workers will still experience burdens in the form of stress, lack of sleep, fatigue, and physical strain. However, by providing flexibility in the work arrangements, workers could recover from their fatigue, deprivation of sleep, stress, and so forth if they have enough rest. However, flexible work arrangements in manufacturing firms are not widely implemented for production workers, despite experiencing deterioration in their well-being the most due to their chasing of productivity demands. If HR provided benefits that are valued highly by workers, such as flexible work arrangements, it could strengthen workers' commitment and increase firm performance, as workers will reciprocate the support by increasing their effort and commitment.

These findings align with the theories of the JD–JC model by Karasek (1979). Working intensely in meeting productivity demands without some job controls creates an excessive burden for workers. Flexible work arrangements help workers to control their work to align with their physiological and psychological needs, contributing positively to their well-being. Providing HR support in isolation for workers' needs sends signals – HR lacks concern and support for the welfare of workers. The findings of this study send signals to manufacturing firms to allot some of their job controls to workers affected by chasing productivity demands as a means of appreciating their contributions to the firm. Manufacturing firms should be able to provide support based on what the workers need, and not just based on the economic needs of the firms. Both worker well-being and firm performance can have a better chance to be accomplished successfully and simultaneously via an understanding of fulfilling mutual needs between workers and organizations.

Managerial implications

The findings of this study also have managerial implications for manufacturing firms. Firms need to provide a more supportive work environment. A conducive, supportive culture could indirectly empower workers working in manufacturing firms amidst high JD by overcoming some problems with worker well-being and helping increase worker morale and motivation to achieve organizational goals (i.e. productivity demands).

Chasing productivity demands is crucial for firm performance, despite its negative consequences on worker well-being; thus, managers and/or HR departments in manufacturing firms should realize the importance of providing workers some controls and flexibilities in performing their jobs. An intense JD, such as workers chasing productivity demands, will not have an adverse impact on worker well-being and firm performance if workers are given empowerment and some controls over their jobs.

The HR department in manufacturing firms should also start experimenting with flexible work arrangements for some production workers and record the progress of the workers involved in these flexible work arrangement programs. Perhaps some adjustments to flexible work arrangements to suit the needs of manufacturing workers and the manufacturing working environment would produce significant effects beneficial to both workers and firms.

Limitations and suggestions for future research

While this study provides useful insights into the relationships among the variables under investigation, it has some limitations that should be acknowledged. First, as the study conducted a cross-sectional design, the possibility of spurious correlations between the dependent and independent variables could never be ruled out. In this regard, future research would benefit from employing longitudinal data for similar investigations. Although this study generated a sample size that focuses on manufacturing workers in electrical and electronics and the automotive and related equipment industries, the results obtained cannot be generalized to the rest of the manufacturing industries. Future research may include a larger sample of workers within a wide range of manufacturing industries to enhance the generalizability of the results. Another limitation stems from the use of data based on a single source for testing the effect of chasing productivity demands on worker well-being and firm performance, and thus the study's findings may have been affected by the problem of potential CMB. Although this issue of CMB has been addressed through procedure remedy where the respondents' data with high SDE were removed, several other techniques such as collecting data from multiple sources or conducting longitudinal research should be attempted in future studies to overcome the potential CMB problem. Finally, it should be acknowledged that relying on the perceptual measurement of performance constructs is always a problematic issue in such studies like ours as it introduces biases and measurement errors. Although it is difficult to gain access to objective measures of performance at the organizational level, HR scholars should be encouraged to utilize a range of both subjective and objective measures whenever possible. Thus, extending the study through the usage of objective data and supplementing it via more in-depth methods would represent a fruitful area for future research; this may also produce more definitive results.

References

Allen, T.D. (2001), "Family-supportive work environments: the role of organizational perceptions", *Journal of Vocational Behavior*, Vol. 58, pp. 414-435.

Andersen, L.L., Fallentin, N., Thorsen, S.V. and Holtermann, A. (2016), "Physical workload and risk of long-term sickness absence in the general working population and among blue-collar workers: prospective cohort study with register follow-up", *Occup Environ Med*, Vol. 73 No. 4, pp. 246-253.

Au, W.C. and Ahmed, P.K. (2016), "Relationships between superior support, work role stressors and work-life experience", *Personnel Review*, Vol. 45 No. 4, pp. 782-803.

Aziz, R.A., Rani, M.R.A., Rohani, J.M., Adeyemi, A.J. and Omar, N. (2013), "Relationship between working postures and MSD in different body regions among electronics assembly workers in Malaysia", *Industrial Engineering and Engineering Management (IEEM), 2013 IEEE International Conference*, pp. 512-516.

Bagozzi, R.P. and Yi, Y. (1988), "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol. 16 No. 1, pp. 74-94.

Bakker, A.B. and Demerouti, E. (2007), "The job demands-resources model: state of the art", *Journal of Managerial Psychology*, Vol. 22 No. 3, pp. 309-328.

Barney, C.E. and Elias, S.M. (2010), "Flex-time as a moderator of the job stress-work motivation relationship: a three nation investigation", *Personnel Review*, Vol. 39 No. 4, pp. 487-502.

Baron, R.M. and Kenny, D.A. (1986), "The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations", *Journal of Personality and Social Psychology*, Vol. 51 No. 6, pp. 1173-1182.

Bas, M., Mayer, T. and Thoenig, M. (2017), "From micro to macro: demand, supply, and heterogeneity in the trade elasticity", *Journal of International Economics*, Vol. 108, pp. 1-19.

Berkery, E., Morley, M.J., Tiernan, S., Purtill, H. and Parry, E. (2017), "On the uptake of flexible working arrangements and the association with human resource and organizational performance outcomes", *European Management Review*, Vol. 14 No. 2, pp. 165-183.

Boekhorst, J.A., Singh, P. and Burke, R. (2017), "Work intensity, emotional exhaustion and life satisfaction: the moderating role of psychological detachment", *Personnel Review*, Vol. 46 No. 5, pp. 891-907.

Boxall, P. and Macky, K. (2014), "High-involvement work processes, work intensification and employee well-being", *Work, Employment and Society*, Vol. 28 No. 6, pp. 963-984.

Bryson, A., Forth, J. and Stokes, L. (2017), "Does employees' subjective well-being affect workplace performance?", *Human Relations*, Vol. 70 No. 8, pp. 1017-1037.

Burke, R.J., Singh, P. and Fiksenbaum, L. (2010), "Work intensity: potential antecedents and consequences", *Personnel Review*, Vol. 39 No. 3, pp. 347-360.

Busch, T. and Hoffman, V. (2011), "How hot is your bottom line? Linking carbon and financial performance", *Business Society*, Vol. 50 No. 2, pp. 233-265.

Byrne, B.M. (2001), "Structural equation modeling with AMOS, EQS, and LISREL: comparative approaches to testing for the factorial validity of a measuring instrument", *International Journal of Testing*, Vol. 1 No. 1, pp. 55-86.

Cañibano, A. (2019), "Workplace flexibility as a paradoxical phenomenon: exploring employee experiences", *Human Relations*, Vol. 72 No. 2, pp. 444-470.

Cha, J., Kim, Y., Lee, J.Y. and Bachrach, D.G. (2015), "Transformational leadership and inter-team collaboration: exploring the mediating role of teamwork quality and moderating role of team size", *Group and Organization Management*, Vol. 40 No. 6, pp. 715-743.

Cheung, Y.B. (2002), "A confirmatory factor analysis of the 12-item General Health Questionnaire among older people", *International Journal of Geriatric Psychiatry*, Vol. 17 No. 8, pp. 739-744.

Chi, S.C.S., Friedman, R.A. and Lo, H.H. (2015), "Vicarious shame and psychological distancing following organizational misbehavior", *Motivation and Emotion*, Vol. 39 No. 5, pp. 795-812.

Chiang, F.F., Birtch, T.A. and Kwan, H.K. (2010), "The moderating roles of job control and work-life balance practices on employee stress in the hotel and catering industry", *International Journal of Hospitality Management*, Vol. 29 No. 1, pp. 25-32.

Coenen, M. and Kok, R.A. (2014), "Workplace flexibility and new product development performance: the role of telework and flexible work schedules", *European Management Journal*, Vol. 32 No. 4, pp. 564-576.

Conner, J. and Ulrich, D. (1996), "Human resource roles: creating value, not rhetoric", *People and Strategy*, Vol. 19 No. 3, pp. 38-49.

Cook, K.S., Cheshire, C., Rice, E.R. and Nakagawa, S. (2013), *Social Exchange Theory. In Handbook of Social Psychology*, Springer, Dordrecht, pp. 61-88.

Crowne, D.P. and Marlowe, D. (1960), "A scale of social desirability independent of psychopathology", *Journal of Consulting Psychology*, Vol. 24 No. 4, pp. 349-354.

Danna, K. and Griffin, R.W. (1999), "Health and well-being in the workplace: a review and synthesis of the literature", *Journal of Management*, Vol. 25 No. 3, pp. 357-384.

Day, A., Crown, S.N. and Ivany, M. (2017), "Organisational change and employee burnout: the moderating effects of support and job control", *Safety Science*, Vol. 100, pp. 4-12.

Demerouti, E. and Bakker, A.B. (2011), "The job demands-resources model: challenges for future research", *SA Journal of Industrial Psychology*, Vol. 37 No. 2, pp. 01-09.

Demerouti, E., Bakker, A.B., Nachreiner, F. and Schaufeli, W.B. (2001), "The job demands-resources model of burnout", *Journal of Applied Psychology*, Vol. 86 No. 3, pp. 499-512.

de Sivatte, I., Gordon, J.R., Rojo, P. and Olmos, R. (2015), "The impact of work-life culture on organizational productivity", *Personnel Review*, Vol. 44 No. 6, pp. 883-905.

Dicke, T., Stebner, F., Linninger, C., Kunter, M. and Leutner, D. (2018), "A longitudinal study of teachers' occupational well-being: applying the job demands-resources model", *Journal of Occupational Health Psychology*, Vol. 23 No. 2, pp. 262-277.

Federation of Malaysian Manufacturers (FMM) (2017), *FMM Directory of Malaysian Industries 2017*, FMM Directory 48th, Kuala Lumpur.

Fernet, C., Austin, S. and Vallerand, R.J. (2012), "The effects of work motivation on employee exhaustion and commitment: an extension of the JD-R model", *Work and Stress*, Vol. 26 No. 3, pp. 213-229.

Fornell, C. and Larcker, D.F. (1981), "Structural equation models with unobservable variables and measurement error: algebra and statistics", *Journal of Marketing Research*, Vol. 18 No. 3, pp. 382-388.

Friis, R.H. (2015), *Occupational Health and Safety for the 21st Century*, Jones and Bartlett Publishers, Massachusetts.

Gates, S. and Langevin, P. (2010), "Human capital measures, strategy, and performance: HR managers' perceptions", *Accounting, Auditing and Accountability Journal*, Vol. 23 No. 1, pp. 111-132.

Giunchi, M., Emanuel, F., Chambel, M.J. and Ghislieri, C. (2016), "Job insecurity, workload and job exhaustion in temporary agency workers (TAWs) Gender differences", *Career Development International*, Vol. 21 No. 1, pp. 3-18.

Grover, S.L., Teo, S.T., Pick, D., Roche, M. and Newton, C.J. (2018), "Psychological capital as a personal resource in the JD-R model", *Personnel Review*, Vol. 47 No. 4, pp. 968-984.

Hair, J.F., Ringle, C.M. and Sarstedt, M. (2011), "PLS-SEM: indeed a silver bullet", *Journal of Marketing Theory and Practice*, Vol. 19 No. 2, pp. 139-152.

Hair, J.F., Hult, G.T.M., Ringle, C.M. and Sarstedt, M. (2014), *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, SAGE Publications, Thousand Oaks.

Harter, J.K., Schmidt, F.L. and Keyes, C.L. (2003), "Well-being in the workplace and its relationship to business outcomes: a review of the Gallup studies", *Flourishing: Positive Psychology and the Life Well-lived*, Vol. 2, pp. 205-224.

Hofmann, D.A., Burke, M.J. and Zohar, D. (2017), "100 years of occupational safety research: from basic protections and work analysis to a multilevel view of workplace safety and risk", *Journal of Applied Psychology*, Vol. 102 No. 3, pp. 375-388.

Huang, L.C., Ahlstrom, D., Lee, A.Y.P., Chen, S.Y. and Hsieh, M.J. (2016), "High performance work systems, employee well-being, and job involvement: an empirical study", *Personnel Review*, Vol. 45 No. 2, pp. 296-314.

Hyatt, E. and Coslor, E. (2018), "Compressed lives: how "flexible" are employer-imposed compressed work schedules?", *Personnel Review*, Vol. 47 No. 2, pp. 278-293.

Janssen, O. (2000), "Job demands, perceptions of effort-reward fairness and innovative work behaviour", *Journal of Occupational and Organizational Psychology*, Vol. 73 No. 3, pp. 287-302.

Johnson, R.B. and Onwuegbuzie, A.J. (2004), "Mixed methods research: a research paradigm whose time has come", *Educational Researcher*, Vol. 33 No. 7, pp. 14-26.

Karasek, R.A. Jr (1979), "Job demands, job decision latitude, and mental strain: implications for job redesign", *Administrative Science Quarterly*, Vol. 24, pp. 285-308.

Kattenbach, R. and Fietze, S. (2018), "Entrepreneurial orientation and the job demands-resources model", *Personnel Review*, Vol. 47 No. 3, pp. 745-764.

Kim, W., Levy, S.B. and Foster, K.R. (2016), "Rapid radiation in bacteria leads to a division of labour", *Nature Communications*, Vol. 7 No. 10508, pp. 1-10.

Ko, Y.J. and Choi, J.N. (2019), "Overtime work as the antecedent of employee satisfaction, firm productivity, and innovation", *Journal of Organizational Behavior*, Vol. 40 No. 3, pp. 282-295.

Kooij, D.T., Guest, D.E., Clinton, M., Knight, T., Jansen, P.G. and Dikkers, J.S. (2013), "How the impact of HR practices on employ well-being and performance changes with age", *Human Resource Management Journal*, Vol. 23 No. 1, pp. 18-35.

Kossek, E.E. and Michel, J.S. (2011), Flexible work schedules, in Zedeck, S. (Ed.), *Handbook of Industrial and Organizational Psychology: Building and Developing the Organization*, American Psychological Association, Washington, DC, pp. 535-572.

Kossek, E.E., Pichler, S., Bodner, T. and Hammer, L.B. (2011), "Workplace social support and work–family conflict: a meta-analysis clarifying the influence of general and work–family-specific supervisor and organizational support", *Personnel Psychology*, Vol. 64 No. 2, pp. 289-313.

Kotey, B.A. (2017), "Flexible working arrangements and strategic positions in SMEs", *Personnel Review*, Vol. 46 No. 2, pp. 355-370.

Latorre, F., Guest, D., Ramos, J. and Gracia, F.J. (2016), "High commitment HR practices, the employment relationship and job performance: a test of a mediation model", *European Management Journal*, Vol. 34 No. 4, pp. 328-337.

Lau, A.K., Lee, P.K. and Cheng, T.C.E. (2018), "An empirical taxonomy of corporate social responsibility in China's manufacturing industries", *Journal of Cleaner Production*, Vol. 188, pp. 322-338.

Lewis, P. (2014), "The over-training of apprentices by employers in advanced manufacturing: a theoretical and policy analysis", *Human Resource Management Journal*, Vol. 24 No. 4, pp. 496-513.

Messmann, G., Stoffers, J., Van der Heijden, B. and Mulder, R.H. (2017), "Joint effects of job demands and job resources on vocational teachers' innovative work behavior", *Personnel Review*, Vol. 46 No. 8, pp. 1948-1961.

Mishra, S.K. (2014), "Linking perceived organizational support to emotional labor", *Personnel Review*, Vol. 43 No. 6, pp. 845-860.

Moen, P., Kelly, E.L., Fan, W., Lee, S.R., Almeida, D., Kossek, E.E. and Buxton, O.M. (2016), "Does a flexibility/support organizational initiative improve high-tech employees' well-being? Evidence from the work, family, and health network", *American Sociological Review*, Vol. 81 No. 1, pp. 134-164.

Mullane, S.L., Pereira, M.A. and Buman, M.P. (2018), "Sedentary behaviour at the community level: correlates, theories, and interventions", *Sedentary Behaviour Epidemiology*, Springer, Cham, pp. 509-543.

Nunnally, J.C. and Bernstein, I.H. (1994), *Psychometric Theory*, McGraw-Hill, New York, NY.

O'Mahony, M. and Timmer, M.P. (2009), "Output, input and productivity measures at the industry level: the EU KLEMS database", *The Economic Journal*, Vol. 119 No. 538, pp. F374-F403.

Ogbonnaya, C., Daniels, K., Connolly, S. and Van Veldhoven, M. (2017), "Integrated and isolated impact of high-performance work practices on employee health and well-being: a comparative study", *Journal of Occupational Health Psychology*, Vol. 22 No. 1, pp. 98-114.

Plomp, J., Tims, M., Akkermans, J., Khapova, S.N., Jansen, P.G. and Bakker, A.B. (2016), "Career competencies and job crafting: how proactive employees influence their well-being", *Career Development International*, Vol. 21 No. 6, pp. 587-602.

Pozzi, A. and Schivardi, F. (2016), "Demand or productivity: what determines firm growth?", *The RAND Journal of Economics*, Vol. 47 No. 3, pp. 608-630.

Reynolds, W.M. (1982), "Development of reliable and valid short forms of the Marlowe-Crowne social desirability scale", *Journal of Clinical Psychology*, Vol. 38 No. 1, pp. 119-125.

Sallinen, M. and Kecklund, G. (2010), "Shift work, sleep, and sleepiness—differences between shift schedules and systems", *Scandinavian Journal of Work, Environment and Health*, Vol. 36 No. 2, pp. 121-133.

Sarstedt, M., Hair, J.F., Ringle, C.M., Thiele, K.O. and Gudergan, S.P. (2016), "Estimation issues with PLS and CBSEM: where the bias lies!", *Journal of Business Research*, Vol. 69, pp. 3998-4010.

Scheibe, S., Stamov-Roßnagel, C. and Zacher, H. (2015), "Links between emotional job demands and occupational well-being: age differences depend on type of demand", *Work, Aging and Retirement*, Vol. 1 No. 3, pp. 254-265.

Sekaran, U. (1992), *Research Methods for Business*, 2nd ed, John Wiley, New York.

Singla, A., Ahuja, I.S. and Sethi, A.P.S. (2018), "Technology push and demand pull practices for achieving sustainable development in manufacturing industries", *Journal of Manufacturing Technology Management*, Vol. 29 No. 2, pp. 240-272.

Sobel, M.E. (1982), "Asymptotic confidence intervals for indirect effects in structural equation models", *Sociological Methodology*, Vol. 13, pp. 290-312.

Stavrou, E.T. (2005), "Flexible work bundles and organizational competitiveness: a cross-national study of the European work context", *Journal of Organizational Behavior*, Vol. 26 No. 8, pp. 923-947.

Steiber, N. and Pichler, F. (2015), "Trends in work stress and exhaustion in advanced economies", *Social Indicators Research*, Vol. 121 No. 1, pp. 215-239.

Tabachnick, B.G. and Fidell, L.S. (1996), *Using Multivariate Statistics*, Harper Collins College Publishers, New York, NY.

Tadić, M., Bakker, A.B. and Oerlemans, W.G. (2015), "Challenge versus hindrance job demands and well-being: a diary study on the moderating role of job resources", *Journal of Occupational and Organizational Psychology*, Vol. 88 No. 4, pp. 702-725.

Truss, C., Shantz, A., Soane, E., Alfes, K. and Delbridge, R. (2013), "Employee engagement, organisational performance and individual well-being: exploring the evidence, developing the theory", *The International Journal of Human Resource Management*, Vol. 24 No. 14, pp. 2657-2669.

Vakkayil, J., Torre, E.D. and Giangreco, A. (2017), "It's not how it looks!" Exploring managerial perspectives on employee wellbeing", *European Management Journal*, Vol. 35 No. 4, pp. 548-562.

Wood, S.J. and Michaelides, G. (2016), "Challenge and hindrance stressors and wellbeing-based work–nonwork interference: a diary study of portfolio workers", *Human Relations*, Vol. 69 No. 1, pp. 111-138.

Yin, Y., Stecke, K.E. and Li, D. (2018), "The evolution of production systems from Industry 2.0 through Industry 4.0", *International Journal of Production Research*, Vol. 56 Nos 1-2, pp. 848-861.

Yu, W., Ignatius, T.S., Li, Z., Wang, X., Sun, T., Lin, H., Wan, S., Qiu, H. and Xie, S. (2012), "Work-related injuries and musculoskeletal disorders among factory workers in a major city of China", *Accident Analysis and Prevention*, Vol. 48, pp. 457-463.

Further reading

Kowalski, T.H. and Loretto, W. (2017), "Well-being and HRM in the changing workplace", *The International Journal of Human Resource Management*, Vol. 28 No. 16, pp. 2229-2255.

Merriman, K.K. (2017), "Extrinsic work values and feedback: contrary effects for performance and well-being", *Human Relations*, Vol. 70 No. 3, pp. 339-361.

Saridakis, G., Lai, Y. and Cooper, C.L. (2017), "Exploring the relationship between HRM and firm performance: a meta-analysis of longitudinal studies", *Human Resource Management Review*, Vol. 27 No. 1, pp. 87-96.

Singh, P., Burke, R.J. and Boekhorst, J. (2016), "Recovery after work experiences, employee well- being and intent to quit", *Personnel Review*, Vol. 45 No. 2, pp. 232-254.

Corresponding author
Mastura Ab. Wahab can be contacted at: mastura.ab.wahab@usm.my

Table AI. Measurement of constructs

Construct/ Cronbach's alpha	Items	Source(s)
Firm performance ($\alpha = 0.78$)	Based on the following statements, please circle the number that best represents your answer (7-point scales, where 1 = "*strongly disagree*" to 7 = "*strongly agree*") 1. My firm performance in terms of sales has improved over the past 12 months 2. My organization was able to sustain good profit in the past 12 months 3. Productivity rates of the company are constantly at high levels 4. The product/service quality improved over time 5. The staff turnover in the organization is relatively low. Not many staff think about quitting	Gates and Langevin (2010)
Chasing productivity demands ($\alpha = 0.81$)	Based on the following statements, please circle the number that best represent your answer (7-point scales, where 1 = "*strongly disagree*" to 7 = "*strongly agree*") 1. I work hard to achieve the productivity target set for the day 2. I push myself hard to achieve the best quality of output produced 3. I put extra effort to achieve the quantity output set by my department 4. I am willing to do extra time work to achieve the department/organizational target 5. I usually achieve zero defect in my production quality as assessed by quality checks 6. I work long shifts sometimes at night and/or weekends to keep up with the production demands	Exclusive to this study
Well-being ($\alpha = 089$)	The following questions are related to your feelings over the past few weeks. Based on the 5-point scales (1 = "*much less than usual*" to 5 = "*more so than usual*"), please circle the number that best represent your answer. "Have you recently been: 1. Able to concentrate on whatever you are doing? 2. Able to enjoy your normal day-to-day activities? 3. Capable of making decisions? 4. Reasonably happy?	Bun Cheung (2002) drawn originally from General Health Questionnaire (GHQ-12)
HR support ($\alpha = 0.81$)	The statements below are some descriptive statements related to the roles of HR. As an employee in your manufacturing firm, please indicate the extent to which you agree with the following statements using 7-point scales (1 = "*strongly disagree*" to 7 = "*strongly agree*"). "HR recently: 1. Provided needed assistance during peak-time hours of the day or week 2. Provided needed assistance at times of unexpected increases in business 3. Rewarded employees who achieve the productivity demands with salary increment 4. Gave bonuses to employees for achieving the productivity demands 5. Accommodated employees' wishes for overtime work	Conner and Ulrich (1996)

(*continued*)

Table AI.

Construct/ Cronbach's alpha	Items	Source(s)
Flexible work arrangements ($\alpha = 0.76$)	Please answer the following statements based on whatever knowledge you have using 4-point scales (1 = "*not offered and not needed*" to 4 = "*offered and used it*"). "Are these benefits given to you at work? 1. Flextime (begin work early and end work early) 2. Compressed work week (compact total working hours into 4 days and got 3 days off) 3. Telecommuting (do some or all parts of work week occur at home) 4. Job sharing (you do your work half day and your colleague do another half)	Allen (2001)
Social desirability effect ($\alpha = 0.83$)	Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true (T) or false (F) as it pertains to you 1. It is sometimes hard for me to go on with my work if I am not encouraged 2. I sometimes feel resentful when I do not get my own way 3. On a few occasions, I have given up doing something because I thought too little of my ability 4. There have been times when I felt like rebelling against people in authority even though I knew they were right 5. No matter whom I am talking to, I am always a good listener 6. There have been occasions when I took advantage of someone 7. I am always willing to admit it when I make a mistake 8. I sometimes try to get even, rather than forgive and forget 9. I am always courteous, even to people who are disagreeable 10. I have never been irked when people expressed ideas very different from my own 11. There have been times when I was quite jealous of the good fortune of others 12. I am sometimes irritated by people who ask favors of me 13. I have never deliberately said something that hurt someone's feelings	Crowne and Marlowe (1960)