Some hints for writing your essay

There are 2 approaches in which you could write your essay.

Approach 1

You can survey and review the relavant literature on the relationship between pay and performance. Divide your essay into 2 major parts.

Part 1 ⟶ The theory section, for instance, the analysis found in backward bending labor supply curve, and the analysis

found in the efficiency wage Theory (See readings on efficiency wage in LMS).

[part 2] ⟶ Here, you research the literature for empirical evidences that either support or challenges the theory/theories found in part 1 of your essay. for instance, does the notion of paying efficiency wage supports what is happening in the real world?

Also, see "Writing your essay" in LMS.

Approach 2.

For those of you who do not like writing long essays (or do not like to do a lot of readings), but enjoy a bit of challenge and to do something original (Bespoke).

You could test the Efficiency wage model (hypothesis) on the real world.

(See handwritten notes on paying for performance).

If you decide to do this type of analysis - you will pick up a new quantitative skills.

Divide your essay into 2 parts.

Part 1

↓

Write about the Efficiency wage theory (Look at "readings on efficiency wage in LMS).

Accordingly, the efficiency wage model suggests that higher wages will increase workers' effort level. There is a positive Relationship between wages and effort. Increases in wages will increase workers' effort levels while doing their jobs.

Hence, the Relationship between Effort (E) per worker (i) is given as:

$$E_i = e\left[\frac{w_i}{w_e}\right] \quad (1)$$

- E_i: Effort per worker (i).
- w_i: wage inside the Firm
- w_e: Expected prevailing wage outside

Equation (1) says that Effort per worker (E_i) can be derived by dividing (w_i) with (w_e).

Why we need to divide internal wage (w_i) with an external wage (w_e) is linked to the notion that paying a wage (w_i) that is below the prevailing market rate (w_e) can contribute to employee dissatisfaction and other negative attitudes, which can lead to more shirking or sabotage activities, and ultimately a high turnover.

Testing to see if a firm pays efficiency wage or not in the "real world" can be determined by:

$$E_i = \frac{w_i}{w_e}$$

When we divide W_i (inside firm wage) with W_e (market prevailing wage) we get an index for effort.

~~If that value (index)~~

If Net Ei value (index) comes up to be one (1) and above, it infers that the firm is paying efficiency wage and as such, the workers' are less likely to shirk.

Example (Real World Case Study)

We can examine if Bunnings pays its ~~~~ Casual staffs efficiency wage.

To do that we need 2 Wages:

1) We need the wage rate (W_i) for Bunnings — which is around $24.00 per hour.

2) We need the external wage (W_e) which in this case is Bunnings' major competitor, i.e. Home Hardware, which is $23.40.

Once we have (W_i) and (W_e), we can substitute them into equation (1) as shown below.

$$E_i = \frac{24.00}{23.40}$$

$$E_i = \underline{1.026}$$

In this particular case study, the efficiency wage ratio (E_i) is found to be 1.026 which is above Unity (1) indicating that Bunnings is paying their casual staffs an efficiency wage.

Based on the efficiency wage hypothesis, Casual staffs at Bunnings should work and exert more effort than Home Hardware casual staff members because if the staffs at Bunnings are caught shirkings and fired (and end up working for Home Hardware), they would have lost the $0.60 per hour premium.

Hence, the $0.60 is the cost for shirking (making shirking an expensive activity). You can try this exercise on other firms / industries (e.g. Qantas vs. Singapore airlines, Murdoch academic staffs vs. Notre Dame academic staffs, ... etc).

The Essay could further be strengthened by moving the analysis deeper.

If we are happy with the notion that firm chooses wages to minimise the cost per unit of effort $\left[\frac{w_i}{E_i}\right]$

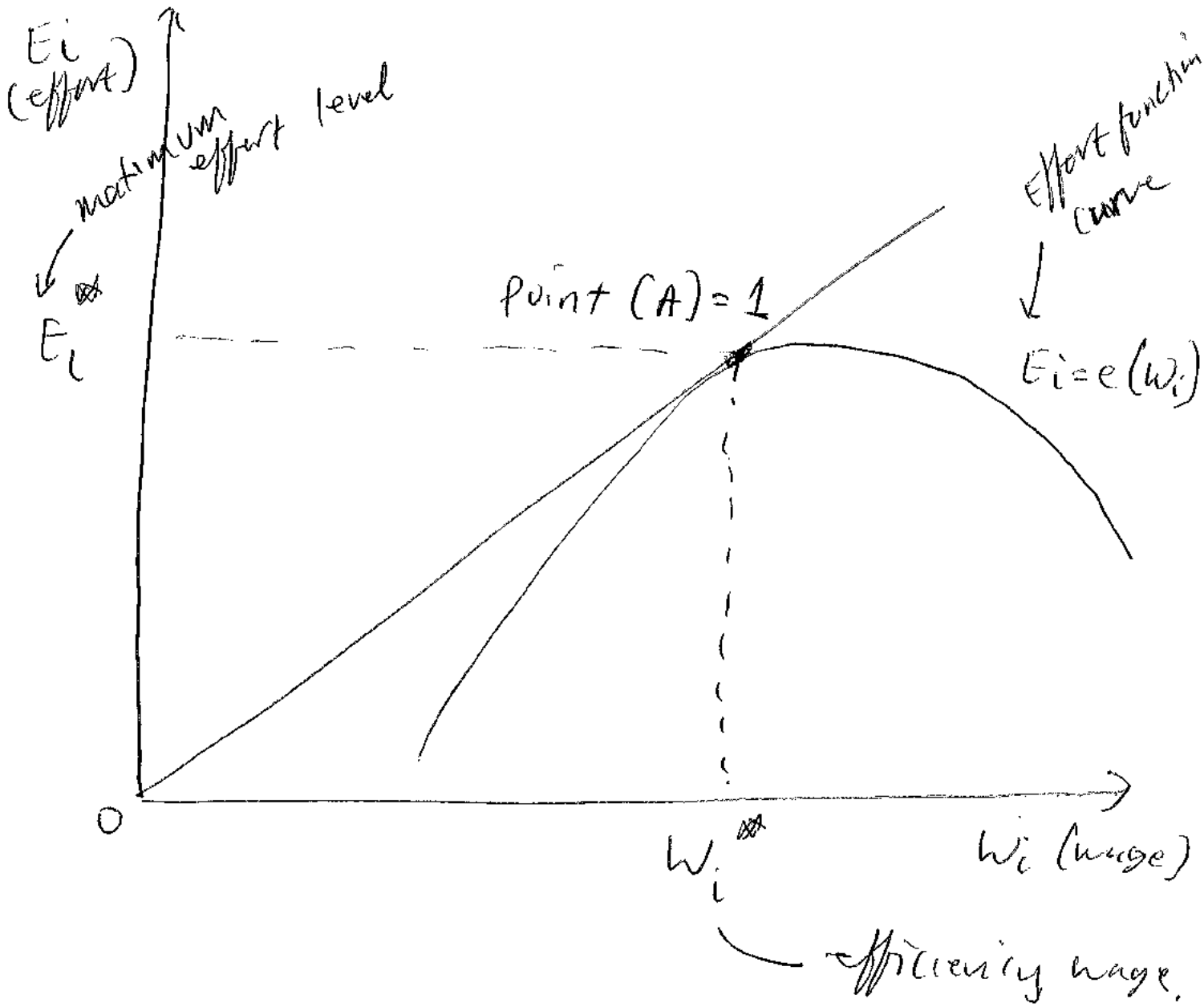
where w_i is the inside firm wage and E_i is derived from $E_i = \frac{w_i}{w_e}$

which we have done earlier with the Bunnings case study,

then to minimise $\left[\frac{w_i}{E_i}\right]$ → wages

must be raised so long as effort ~~varies~~ rises faster then wages. In ~~other~~ other words, it is always worthwhile to raise the wage so long as 1 per cent rise in wages brings forth a more than 1 per cent ~~rise~~ rise in effort. But once this ceases to be the case, the firm will stop raising wages, as show in Figure 1.

Figure 1 : Effort (E_i) / Wage (w_i) Relationship



According to the ~~Fee~~ Figure above, Point A is where the optimum amount of E_i (effort) can be exerted by a worker given w_i^* (wage).

Beyond point (A) Effort (E_i) will not increase no matter how much wage is increased (w_i). In fact, beyond point A – Effort level (E_i) will decline despite an increase in wage (w_i). This is know as the Solow condition in that:

$$\frac{\triangle E_i}{\triangle w_i} = \underline{1}$$

Beyond point A [Above Unity (1)] the ~~ability~~ inability of $\uparrow w_i$ to $\uparrow E_i$ can be explain by the logic of the Backward Bending labour supply curve.

We can work out the Optimum efficiency wage which a firm should pay by working out the Elasticity of effort (E_i) with respect to wage (w_i):

$$e_i = \frac{\text{Log } E_i}{\text{Log } w_i}$$

Logarithms or $\log^{10}$

Elasticity of Effort

If the e value is found to be less than 1 (i.e. < 1), say 0.50, we can increase wage (w_i) further until e becomes 1. (i.e. $0.50 \rightarrow 0.60 \rightarrow 0.70 \cdots 1$ max).

If the e value is above 1, we should stop increasing wage (w_i).

Hence:

$$< 1 \Rightarrow \uparrow w_i$$

$$> 1 \Rightarrow \text{stop } w_i$$

$$\max w_i = 1.$$

We can test this with the Bunnings case study which we have done earlier.

We have:

(w_i) \$24.00 per hour wage for Bunnings

(w_e) \$23.40 per hour wage for Home Hardware

Using:

$$e_i = \frac{\log E_i}{\log w_i} \qquad (2)$$

Effort

Elasticity of Effort

Inside wage which in this case is Bunnings!

To work out e_i we need E_i and w_i.

E_i is derived from $\frac{\$24.00}{\$23.40}$

$$\left[e_i = \frac{w_i}{w_e} \right]$$

$$E_i = 1.026$$

once we have the value for E_i (1.026)

and W_i ($24.00), we can substitute both of these values into equation (2):

$$\left[e_i = \frac{\log E_i}{\log W_i} \right]$$

Hence:

$$e_i = \frac{\log 1.026}{\log \$24.00}$$

~~Eq~~ Use a logarithm calculator (many can be found on the web, for example, http://www.rapidtables.com/calc/math/log_Calculator.htm).

to convert 1.026 and $24.00 in to $\log^{10}$.

$$e_i = \frac{0.0125}{1.39}$$

$$e_i = 0.009 \text{ (approximate)}.$$

The e_i value suggests that if Bunnings wants its casual staffs to increase their effort by 1% Bunnings needs to increase their wage by 0.009%. In other words, for every 1% rise in effort wages must rise by 0.009%.

I have also ~~attached~~ attached 2 more examples on testing the efficiency wage hypothesis on the real world.

One is Dr. MUSA ALI's Doctorate Thesis which I Supervised.

The other is a paper which I wrote.

Dr. MUSA ALI (Doctorate Thesis which I supervised)

2.2.1 A Simple Efficiency Wage Model

The relationship between effort and wages as proposed by Solow (1979) can be summarised as follows:

$$E_i = e\left(\frac{W_n}{W_e}\right) \tag{2.1}$$

Effort (E) per worker i is driven by the ratio of W_n ,the wage in the firm, and W_e which is the expected prevailing wage outside the firm and e is the efficiency wage ratio. This ratio e encapsulates or measures the worker's effort. *Ceteris paribus*, the larger the relative wage premium, the greater will be the effort exerted. A ratio, e, with a value of above 1 implies that the firm is paying an efficiency wage, and vice versa.

Several studies have reported a significant relationship between efficiency wages and employees' effort (Kruger and Summer , 1988; Katz and Summer,1989; Wadhawani and Wall, 1991). The classic example of this relationship is drawn from the 1914 Ford Motor Company case. In 1914, the Ford Motor Company decided to pay Ford workers $5, which was approximately doubled that was previously paid to them. The result was an increase in the workers' productivity by about 55 percent (Raff and Summer, 1987). Studies carried out by Kohli (1988), Huang et al. (1998) and Goldsmith et al. (2000) found positive relationship between efficiency wages and employees' effort. For instance, Goldsmith et al. (2000) reported that 'receiving an efficiency wage enhances a person's effort and that person's providing greater effort earn higher wages' (p.351). Huang et al. (1998) surveyed 18 manufacturing firms in the US, covering the period from 1986 to 1991, and found that paying efficiency wage did increase the workers' productivity. Similarly, Kohli (1988) reported a

wage accelerated effect amongst the workers in manufacturing industries in the US where the effort of employees depended on the rate of wage change.

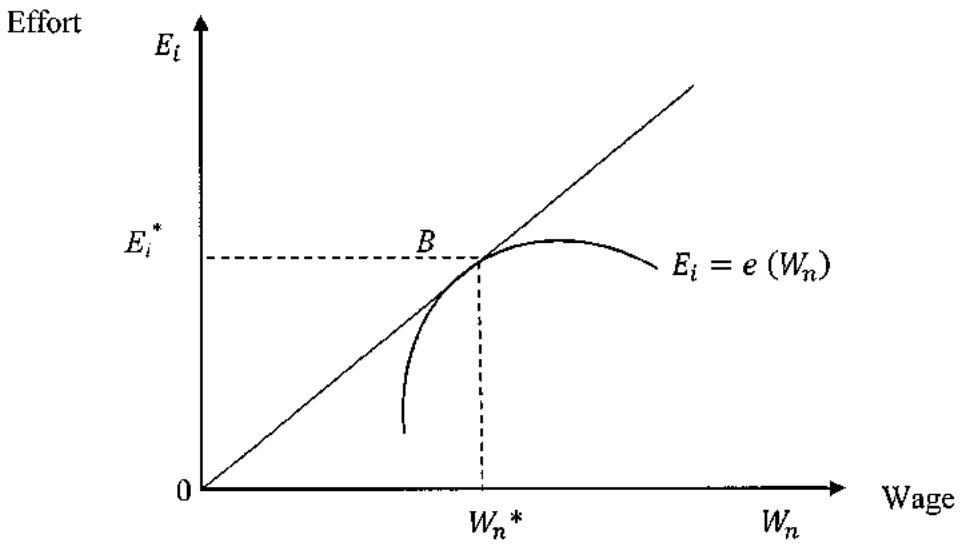
Although most research on the effects of efficiency wages were conducted on private organisations, the few studies on the public sector have shown consistencies with the efficiency wage hypothesis. For instance, Lindsay (2009) reported that the police department in the United States offered a wage premium to their officers (despite the fact that the police department are not profit oreinted) in order to boost morale and to deter them from leaving for better-paying organisations. Lindsay (2009) provided some empirical evidence on a positive correlation between employees' effort and high wages. Davis and Gabris (2008), using a salary and fringe benefit survey and a reputational quality questionnaire, examined the impact of efficiency wage on workers' performance in various municipalities located throughout the Chicago suburban metropolitan area (SMA). They found that wages were positively related to service quality; high wage levels contributed to an increase in service quality. Leavitt and Morris (2008) conducted interviews with the human resource directors of the city council at the Seven Hampton Road Virginia. They found that the council implemented a market based pay system as one of the strategies to attract and retain a highly qualified workforce.

Taylor and Taylor (2011) examined the relationship between wages and effort amongst public sector employees in 15 selected countries, which included Australia and the United State. They found a positive correlation between wages and effort. On average, they estimated that a rise of 0.24 per cent on public sector employees' wages was associated with a one per cent rise in the effort levels of employees. Taylor and Taylor's (2011) findings supported the previous findings by Rainey (1982), Gabris and Simo (1995) and Crewson

(1997), in that wages played an important role in the motivation and performance levels of public sector employees.

However, the positive relationship between effort and wages cannot go on indefinitely, as shown in Figure 2.2. This is because the relationship between higher wages and effort is subject to the constraint of diminishing returns (Solow, 1979). Although each increment of effort can be generated by increasing wages, beyond the maximum effort level, E_i*, at point B, successive increase in wages will lead to a fall in effort. Once E is at its optimum (point B), which is also known as the Solow Condition, it will be counter-productive to continue to increase wages. Solow (1979) proposed ratio (e) to be unity or 1.

Figure 2.2: The Effort and Wage relationship: The Solow Condition



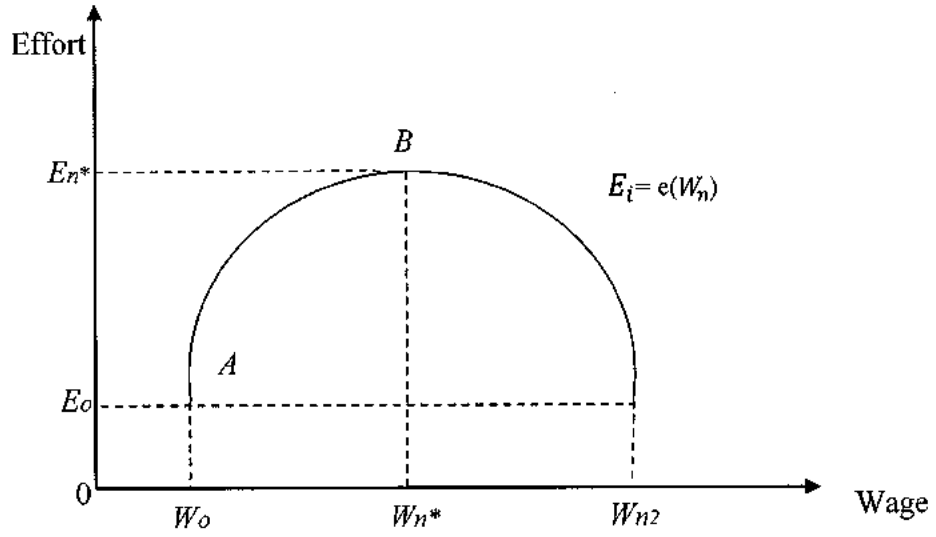
Source: Adapted from Layard, Nickell and Jackman,1991, p.152

Hence, the maximum or optimum amount of wages that should be paid to be the employees is W_n * to produce the maximum amount of effort, E_i*. W_n* is therefore the efficiency wage – a

wage that could increase the employee's productivity by extracting the maximum amount of effort.

Similarly, Taylor and Taylor (2011) proposed that the effort function has diminishing returns built in, as shown in Figure 2.3.

Figure 2.3: The relationship between effort and wages



Source: Taylor and Taylor , 2011, p.73

Taylor and Taylor (2011) explain that when the wages at *Wn** is greater than *Wo,* workers are motivated to exert a high effort level for fear of losing their job and wage premium. However, the positive relationship between wages and effort may not continue beyond the optimum point *B*, which represents the equilibrium point of *En** for effort and *Wn** for wages, because beyond this point, any increase in wages will cause the effort level of the employees to fall. According to Taylor and Taylor (2011), there are two possible reasons for the reduction in effort despite an increase in wages. One is linked to the notion of the backward bending labour supply curve. The other can be explained by intrinsic motives in the form of PSM (Taylor and Taylor, 2011) which will be discussed later in this chapter. Prior to that, it is

appropriate for the following sections to provide a brief overview of the backward bending labour supply curve. In doing so, the analysis of the relationship between wage and effort is more complete.

2.2.2 The Backward Bending Labour Supply Analysis

The rationale of the backward bending labour supply curve can be summarised with a "well-behaved" utility function:

$$U=U(x, L) \tag{2.1}$$

where x denotes a consumption bundle in that $x = (x_1, x_2, \ldots, x_n)$, and L denotes the amount of leisure time in that $U_L>0$. U is the utility of an employee.

The employee faces two constraints. The price of the consumption bundle, x, and the amount of time spent on working. These constraints are captured by equation (2.2) below:

$$\sum P_i x_i \leq M = wz + \bar{M} \tag{2.2}$$

where P_i is the price of the consumption bundle x_i, M is the money income, W is the wage rate, Z is 'work time' and $\bar{M}$ is non-work income.

Time budget (T) is derived from

$$T=Z+L \tag{2.3}$$

Substituting equation (2.3) into (2.1), gives:

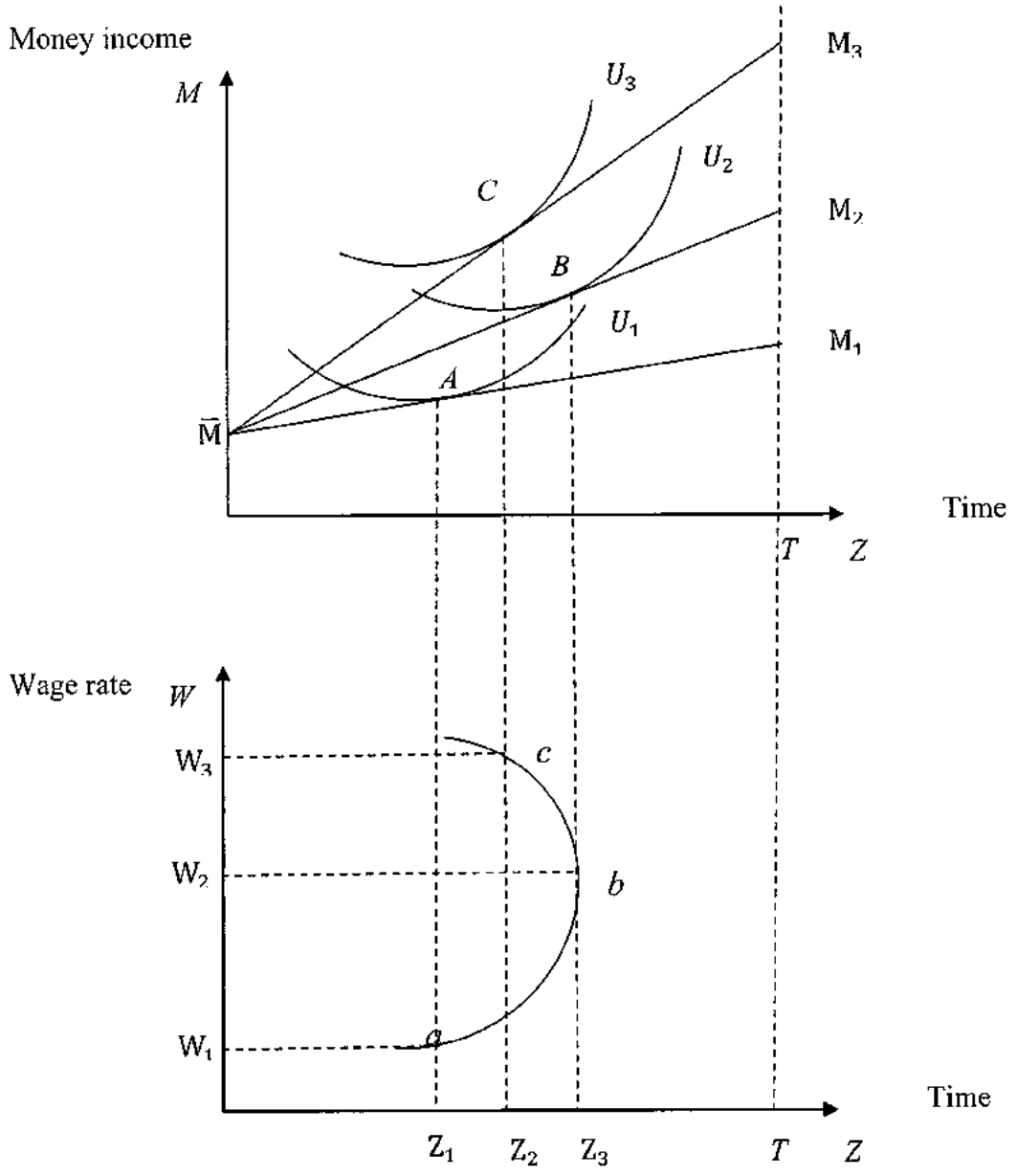
$$U=u(x, T-Z) \text{ and } U_Z = -U_L \tag{2.4}$$

The optimisation of x, L and Z is as follows:

$$\max u(x, \bar{L}) \text{subject to} \sum P_i x_i \leq W\bar{Z} + \bar{M} \tag{2.5}$$

where - indicates fixed. This exposition is depicted in Figure 2.4

Figure 2.4: The backward bending labour supply curve analysis



Source: Gravelle and Rees ,1992, p.153

As wages increase, the wage line (origin at $\bar{M}$) becomes steeper. The optimal or equilibrium position changes from *A* to *B* to *C* as wage increases from W_1 to W_2 to W_3 respectively.

The bottom figure (of Figure 2.4) shows the amount of labour supplied at the different wage rates, *a, b* and *c* on the supply curve *S* corresponding to the optimal positions *A, B* and *C*. The locus of the optimal points (*A, B,* and *C)* in the above figure (of Figure 2.4) generates the supply curve (derived from the points, *a, b,* and *c*) in the below figure (of Figure 2.4).

The backward bending supply curve suggests that an increase in wages raises the supply of labour at low wage rates but at high wage rates, increasing the wages will lead to a decline in the supply of labour. A reduction in labour supply is an indication for an increase in the demand for leisure. If workers are assumed to be utility maximisers, they would substitute wages with leisure once they have earned enough to satisfy their current consumption habits. A study conducted by Camerer, Babcock, Loewenstein, and Thaler (1997) on the labour supply of New York cab-drivers seems to support the backward bending labour supply curve analysis. They reported that once the cab-drivers met their daily income target, they would stop working, as reflected by the negative elasticities on their labour supply.

4.3 Methodological Framework: The Relationship between Efficiency Wages and Effort

The framework for analysing the relationship between efficiency wages and effort is based on Taylor and Taylor's (2011) model, as shown below.

$$e = Wn/We \tag{4.1}$$

As discussed in Chapter Two, paying a wage, *Wn*, that is higher than the prevailing wage outside the organization, *We*, would operate as an incentive for employees to increase their effort level. According to the efficiency wage logic, when *Wn* is greater than *We*, employees are motivated to exert greater effort than otherwise for fear of losing that wage premium. The ratio *e* that is derived from *Wn/We* captures the intensity of effort. A ratio *e* above 1 (unity) implies that efficiency wage is being paid to the Malaysian public employees, and vice versa.

However, the positive relationship between effort and higher wages cannot continue indefinitely for various reasons which have been discussed by Taylor and Taylor (2011) and in Chapter Two. As such, it would be useful for employers to have some form of indicators in order to develop an effective and efficient salary system that fosters optimum effort levels. The Solow condition (1979) has specified how much government needs to pay its employees in order to raise their effort levels, and when to stop increasing wages (see Chapter Two, Figure 2.2). According to Solow (1979), employers will always find it worthwhile to raise the wage as long as a 1 percent rise in wages brings forth a more than 1 percent rise in effort. Once this ceases to be the case, employers should stop raising wages. Taylor and Taylor

(2011, p. 74) demonstrated that "the optimum efficiency wage can be determined by working out the elasticity of effort with respect to wage";

$$ee = \Delta \log Ei / \Delta \log Wn \tag{4.2}$$

where

Δ = the responsiveness of a change (Δ) in one variable on another variable. Here, it will establish how a change (Δ) in wage will affect the change (Δ) in effort

Log = logarithms

ee = the elasticity of effort

Ei = effort which is captured by the efficiency wage ratio

Wn =employee's wages inside the organisation

4.3.2 Findings on the relationship between Efficiency wages and effort

Table 4.1: The average monthly salary (in RM) and efficiency wage ratio (*e*) based on job classifications in public and private Malaysian HEIs

Job Classifications	Public[1]	Private[2]	*e*
Academic			
Professor	18525	18630	0.99
Associate Professor	7845	13750	0.57
Senior Lecturer	7101	10400	0.68
Lecturer	5529	6500	0.85
Average	*9750*	*12320*	*0.77*
Non academic			
Managerial and Professional	5685	6800	0.83
Supporting 1	3135	2400	1.30
Supporting 2	1774	1500	1.18
Average	*3531*	*3566*	*1.10*
Average for all job classifications	*7084*	*8568*	*0.83*

Source : [1] Jabatan Perkhidmatan Awam (2007 ; 2010d).
[2] Private HEIs's websites

Table 4.1 shows that the average *e* ratio for all job classifications in the Malaysian public HEIs is 0.83, which is less than unity. This suggests that the employees in Malaysian public HEIs are not paid efficiency wages. On average, academics are paid less than the private institutions as indicated by a ratio *e* of 0.77 (or 22 percent). The ratio is 0.99 for professor and 0.85 for lecturer. Associate professor and Senior lecturer received much lower wages with *e* ratios of 0.57 and 0.68 respectively.

The non-academics, with the exception of the Managerial and Professional group (*e* ratio of 0.83), fared much better. The average *e* ratio of 1.11 indicates that non-academics in the public HEIs were paid efficiency wages. The e ratio was 1.30 for Supporting 1 group and 1.18 for Supporting 2 group.

Based on the efficiency wage analysis, it is appropriate for the Malaysian government to increase wages in public HEIs. How much to increase can be determined by working out the elasticity of effort with respect to wage (equation 4.2). The value derived from equation (4.2) is the amount (in percentage) that should be paid in order to increase the employees' effort by 1 percent.

Table 4.2 shows the elasticities of effort with respect to wages *(ee)* of the various job classifications.

Table 4.2: Elasticity of wage (*ee*) based on job classifications in Malaysian HEIs

Academic	*ee*	**Non academic**	*ee*
Professor	0.001	Managerial & Professional	0.02
Associate Professor	0.06	Supporting 1	0.03
Senior Lecturer	0.04	Supporting 2	0.02
Lecturer	0.02		
Average	*0.03*	*Average*	*0.02*
Average of all job classifications			*0.02*

The estimated value *ee* of 0.02 on all job classifications would suggest that, on average, for every 1 percent increase in effort, the Malaysian government needs to increase wages by 0.02 percent. For instance, in order to increase effort by 1 percent, wages has to be increased in the amount of RM 13.98 per month.

Table 4.2 shows that *ee* values vary across job classifications. The average *ee* value for academics was 0.03 during the survey period. This indicates that in order to increase effort levels by 1 percent, the government of Malaysia needs to raise the public HEIs wages by 0.03

percent. Associate Professors needed an increase of 0.06 percent of wages in order to raise effort levels by 1 percent. Compared to other academic levels, Associate Professors required the highest increase in wages for an additional 1 percent rise in effort. Senior Lecturers required a 0.04 percent increase and Lecturers required a 0.02 percent increase. To increase their effort level by 1 percent, Associate Professors and Senior Lecturers needed a higher percent increase in wages compared to Lecturers and Professors. This might be due to the higher salary gap for Associates Professors and Senior Lecturers between public and private HEIs. The Professors required the smallest increase in wages of around 0.001 percent in order to increase 1 percent of effort level. This can be due to the fact that, on average, the salary of Professors at public HEIs is almost the same salary at private HEIs.

As for the non academic staff members, a mean *ee* value of 0.02 implies that the government needs to increase their wages by 0.02 percent in order to increase their effort level by 1 percent. Supporting 1 group would require a 0.03 percent increase in wages to bring about an increase in effort of 1 percent. Both the Managerial/Professional and Supporting 2 groups would require increases of 0.02 percent. The data in Table 4.2 suggest that non-academic staff would require a lower increase in wages compared to academics staff members for a 1 percent increase in effort.

Taylor and Taylor (2011).

sector were more motivated by high wages than their counterparts who were attracted to the public sector, the latter group was more concerned about receiving comparable wages than the former group, suggesting that wages do matter to prospective government job applicants. In addition, Brewer et al. (2000) found empirical evidence that monetary rewards are relevant to some individuals with high levels of PSM. Monetary rewards were significantly related to two of the four conceptions of PSM that they studied. It appears that monetary rewards are relevant to some individuals with high levels of PSM but not to others, based primarily on their conceptions of public service and the public interest.

Frey and associates (Frey, 1997; Frey & Jegen, 2001) highlighted the dual impact of monetary rewards by distinguishing between situations in which rewards are perceived as controlling, and situations in which they are viewed as supportive. Frey argued that monetary rewards can "crowd out" employees' intrinsic motivation and reduce employees' effort if they see the reward as a device to control their behavior, or if the incentive scheme conflicts with their views (e.g., professional norms). In this case, it is likely that high wages at the expense of an employee's PSM can cause him or her to experience alienation. On the other hand, monetary rewards can "crowd in" employees' intrinsic motivation when they perceive the rewards as supportive that is, an acknowledgement of their work effort and their high intrinsic work motivation. Monetary rewards can sometimes serve intrinsic purposes. For example, an employee who receives a small monetary reward for an accomplishment may not be very motivated by the token reward (instrumental value), but he or she may be highly motivated after receiving recognition for the accomplishment of a job (symbolic value). Here, the monetary reward merely serves as the vehicle or conduit through which intrinsic motivation travels.

The Research Framework

This research framework is divided into two parts. We begin our analysis with the efficiency wage model, followed by the PSM model. Under the efficiency wage model, effort (E) per employee (i) is a function of the employee's wage in the organization (W_n) relative to the prevailing wage outside the organization (W_e), as summarized in the equation below:

$$E_i = W_n / W_e \quad (1)$$

According to Shapiro and Stiglitz (1984), firms cannot force their employees to exert full effort. Rather, they can make work attractive so that workers would choose not to shirk for fear of losing their job. This line of argument assumes the presence of a competitive market where employees are indifferent to jobs because there are identical and similar paying jobs available in the labor market. As a result of this indifference to jobs, employees are less likely to exert high effort but are more likely to shirk. The worst case scenario that they lose their job for substandard performance or engaging in shirking

The complete paper is in LMS.

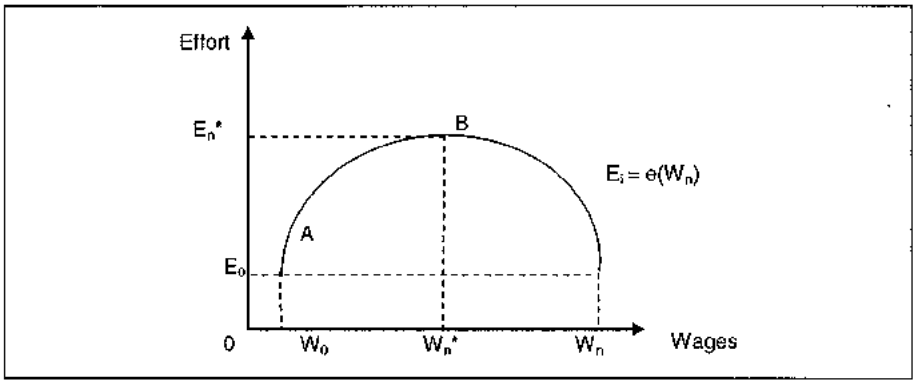


Figure 1. The relationship between effort and wage

activities will have a minimum impact on them because they can always find another similar paying job easily. To induce workers to exert maximum effort, firms must give something to employees (Akerlof, 1982). Paying a wage premium or a wage rate that is, higher than the market rate would serve as an incentive to increase effort level (Yellen, 1984). When W_n is greater than W_e, workers are motivated to apply greater effort for fear of losing their job and their wage premium.

The efficiency wage theory assumes that effort level follows closely that of wage premium. The effort level (E) of a government worker (i) is thus derived by taking the ratio of his or her wage (W_n) and the prevailing wage outside his or her organization (W_e). This ratio captures the intensity of the worker's effort. All things being equal, the larger the wage premium, the greater the effort exerted. A ratio above 1 implies that workers will exert full effort in performing their job duties because they are paid wages higher than their counterparts outside their organization. A ratio of above 1 suggests that the efficiency wage is being paid.

The positive relationship between effort and high wages may not continue indefinitely for various reasons. Figure 1 indicates that at point A, the wage paid is W_0 and the corresponding effort level is E_0. Beyond this point, an increase in wage leads to an increase in the effort level of employees. This will continue until point B which represents the optimal level of effort E_n*. At this point, the wage is at W_n*, which is the efficiency wage level. After point B, subsequent wage increases will cause effort level to fall. A wage increase from W_n* to W_n will result in a decline in effort from E_n* to E_n.

One possible reason why an increase in wage beyond W_n* will lead to a reduction in effort is, derived from the backward bending labor supply curve (Gravelle & Rees, 2004). Orthodox labor supply models tend to predict a positive labor supply reaction to an increase in wages. Employees would substitute labor with leisure, and vice versa. They would supply more labor when wages are high, and consume more leisure when wages are low (Lucas & Rapping, 1969). Although this prediction is straightforward, it is difficult to verify and not universally accepted. Camerer, Babcock, Loewenstein,

and Thaler (1997) reported negative elasticities on the labor supply of New York cabdrivers, which suggests the existence of a backward labor supply curve in the New York cab industry. Once cabdrivers meet their daily income target, they quit working. This implies a particular work/leisure preference function in which the negative income effect outweighs the substitution effect of a wage rise. This is always an empirical question for a particular type of labor supplied.

Another reason for the drop in effort despite an increase in wages beyond the optimum point can be drawn from the body of literature on the negligible or negative impact of the pay for performance schemes on the effort levels of government employees. There is substantial empirical evidence showing that many pay for performance schemes are either meaningless or dysfunctional in the public sector (Ingraham, 1993; Perry, Engbers, & Jun, 2009; Senate Standing Committee of Finance and Public Administration, 1993). For instance, in her review and empirical investigation of high performance bonus systems in government, Heinrich (2007, p. 281) concluded that "high performance bonus systems are more likely to encourage misrepresentation of performance and other strategic behaviors than to recognize and motivate exceptional performance or performance improvements."

To ensure that employees exert maximum effort level, Solow (1979) stated that it is worthwhile to raise the wage rate as long as 1% rise in wages brings forth more than 1% rise in effort. Once this ceases to be the case, firms should stop raising wages. This relationship between wages and effort will be measured using the elasticity concept. The elasticity concept is basically a mechanism that is used to measure the responsiveness of a change (Δ) in one variable on another variable (Marshall, 1920). It will determine how much a change in one variable (e.g., wages) affects the change in another variable (effort).

Accordingly, the relationship between wages and effort, and the optimum efficiency wage can be determined by working out the elasticity of effort with respect to wage (e), as shown below:

$$e = \Delta \log E_i / \Delta \log W_n \qquad (2)$$

where *log* is logarithms. The data are converted into logarithms, which is the conventional approach of measuring elasticity (Holt & Samuelson, 1946).

Like the efficiency wage theory, the PSM literature also argues that a perceived practical benefit of PSM is its link to organizational performance (Brewer, 2007; Brewer & Selden, 2000; Kim, 2005). Drawing from job design research findings, Perry and Wise (1990) propose that job characteristics can have a motivating impact on effort. Workers with high levels of PSM are likely to be motivated by particular attributes in the public service, such as activities that provide opportunities to address questions of social equity, pursue social programs, advocate a valued special interest, and express loyalty to country. Wright (2004) clarified that if government employees who are motivated to make a worthwhile contribution to society perceive that their work is important to accomplishing organizational goals that benefit society, then they will

exert higher effort levels. Their concern for the public or social service, including their conviction that their effort can affect the valued service, motivates them to raise their effort levels (Francois, 2000).

To determine how much change in PSM contributes to effort, our model will estimate the elasticity of effort with respect to PSM (*ef*).

$$ef = \Delta \log PSM_i / \Delta \log E_i \quad (3)$$

Method

Sample

Like the research of Brewer and Selden (1998) and Brewer (2003), this study attempts to use a representative random sample. It uses data from the 2005 *International Social Survey Programme (ISSP): Work Orientations*, which adopts a multistaged stratified random sampling of citizens aged 18 years or above (16 years and above for Japan) across different countries. Fifteen countries are selected for this study: United States, Canada, Great Britain, Denmark, France, Germany, Spain, Bulgaria, Slovenia, Russia, Israel, Japan, Taiwan, Australia, and New Zealand. The total number of respondents is 20,787. The next step involves selecting only the respondents who are in full-time employment, and those working in the public sector and private sector; others are removed from the dataset. Private sector respondents include self-employed individuals. The final number of respondents is 9,961. On average, the respondents were 41.7 years, and worked 44 hr per week. A majority of them were males (57%), married (63%), held higher than secondary school qualifications (26%), belonged to a religious denomination (73%), worked in the private sector (70%), but had never been a trade union member (50%), and did not hold a supervisory position at work (61%). This final sample is representative of the larger sample on the above demographic variables with the exception of age, education, and working hours. Most of the respondents in the larger sample were older (with a mean age of 47.6 years), held lower educational qualifications (23% had secondary school qualifications), and worked shorter hours (a mean of 40 hr per week). These discrepancies between the final and original samples can be explained by the fact that the original sample includes casual and part-time workers, and the unemployed, whereas the final sample only takes into account the full-time employed.

Measures

This study uses the following measures:

1. *Employee effort*: Given the difficulties in obtaining a direct objective measure of employee effort, this model uses a proxy in the form of the ratio between internal wages and external wages. For our purposes, the internal wage is

represented by the wage paid to government workers, whereas the external wage is the private sector wage. Based on the central tenet of the efficiency wage model that effort is a function of relative wage, this use of a wage difference as a proxy of effort has been adopted by Goldsmith, Veum, and Darity (2000) in their empirical study of efficiency wages. A mean annual wage (expressed in the country's currency) is calculated for each country's full-time workforce by sector; one for public sector workers, and another for private sector workers. The wages for most countries are expressed as net income in the datasets, but there are a few, like the United States, Great Britain, Canada, and Australia, which provide gross income. This does not present a major limitation in this study because the relative wage value for each country is derived from calculating the wages between the public and private sectors within that country, and not across countries.

2. *Employee PSM*: As people with high levels of PSM are characterized with a strong sense of public service, the PSM levels of the respondents are measured using two items in the dataset that cover such matters: "A job that allows someone to help other people"; and "A job that is useful to society." On a 5-point Likert-type scale, ranging from 1 (*not at all important*) to 5 (*very important*), the respondents indicated the importance they personally placed on the existence of each item in a job. An average score of the two items is calculated for each respondent, followed by a mean score by sector. In this way, a mean PSM value can be determined for the public sector workforce of each country. Factor analysis (principal component, varimax rotation) of the two items measuring the PSM index revealed a single construct. Cronbach's $\alpha = .79$. Although these two items had been used as a proxy of PSM (Lewis & Frank, 2002; Taylor, 2008), it should be noted that the ISSP is not designed to measure PSM. While an approach such as, this has been frequently applied in PSM research (Kim, 2005; Lewis & Frank, 2002; Naff & Crum, 1999), it is suboptimal compared with Perry's (1997) rigorous measurement scale.
3. *Employee organizational level*: As the ISSP dataset does not provide the respondents' organizational level across different countries, a proxy is again used. The closest item distinguishes between the respondents in supervisory versus those in nonsupervisory roles. The respondents in supervisory roles are assumed to occupy a higher organizational level than those in nonsupervisory roles.

Results

The following results of the government workforce for each of the 15 countries are presented: the efficiency wage ratio, the elasticity of effort with respect to wages (e), and the elasticity of effort with respect to PSM (ef). The efficiency wage ratio shows the ratio between government workers' wages and those of their private sector counterparts. The e value explains the magnitude and direction of the relationship between government

Table 1. Efficiency Wages and Elasticity Values of Full-Time Government Employees in Selected Countries, 2005

Country	Efficiency wage ratio	e	ef
United States (*N* = 150)	0.60	0.20	0.68
Canada (*N* = 190)	1.07	0.21	0.62
Great Britain (*N* = 91)	1.09	0.23	0.61
Denmark (*N* = 380)	0.83	0.18	0.61
France (*N* = 273)	0.88	0.23	0.56
Germany (*N* = 129)	1.20	0.23	0.60
Spain (*N* = 54)	1.22	0.33	0.62
Bulgaria (N = 130)	0.85	0.40	0.65
Slovenia (*N* = 104)	1.15	0.18	0.60
Russia (*N* = 338)	0.78	0.26	0.61
Israel (*N* = 111)	1.14	0.27	0.64
Japan (*N* = 48)	1.25	0.28	0.59
Taiwan (*N* = 162)	1.17	0.22	0.61
Australia (*N* = 218)	1.08	0.21	0.61
New Zealand (*N* = 191)	1.03	0.21	0.61
Average	1.02	0.24	0.61

Note: e = elasticity of effort; *ef* = elasticity of PSM; *N* = number of public sector respondents.

workers' wages and their effort. The *ef* value indicates the association between government workers' PSM and their effort. These two elasticity constructs show how a change in one variable (wages or PSM) affects the change in another variable (effort). The findings are first presented at the aggregate level, followed by the organizational rank level.

Aggregate Findings

The first column in Table 1 shows the efficiency wage ratio of the public sector workforce. The mean value of 1.02 for the government workforce across the 15 countries is found to be above unity. This suggests that government wages in most countries, such as Australia and New Zealand, were slightly above the market rate. There are a few exceptions; government workers from United States, Denmark, France, Bulgaria, and Russia were generally paid below the prevailing market wages.

The second column in the table shows the data on the elasticity of effort with respect to wages (*e*). It was estimated to have a mean value of .24 for the respondents across the 15 countries. This signifies that a rise in government wages by .24% is associated with a 1% rise in the effort levels of government workers, and vice versa. A small *e* value signifies that a small change in government wages is required to change the effort level of the public sector workforce by 1%. Government workers with relatively small *e* values are

those from countries, such as Denmark and Slovenia. The comparatively high *e* value in government workers from countries, such as Bulgaria and Spain, implies that these workers require a greater rise in wages to raise their effort level by 1%.

The third column in Table 1 presents the data on the elasticity of PSM with respect to effort (*ef*). Its mean value for the respondents across the 15 countries is .61. A change in the level of PSM by .61% is related to 1% change in the effort level. A higher *ef* value thus points to the greater importance of PSM in bringing about a change in effort level by 1%. In the case of the American respondents, the data show that .68% change in their PSM levels is associated with 1% change in their effort level. In comparison, a similar change in effort level is associated with .56% change in the PSM level of the French respondents. It appears that PSM is more important in influencing the effort levels of the American than French respondents.

A comparison of the two elasticity values in Table 1 indicates that the *ef* value of the respondents is higher than the *e* value. On average, the *ef* value of the public sector workforce across the 15 countries is .61, which is greater than the *e* value of .24. This trend of higher *ef* value than *e* value is observed for the public sector workforce in each of the 15 countries studied. The results points to the significance of PSM in bringing forth a rise in the level of effort. The central research question in this study is answered affirmatively. PSM contributes to a larger change in the effort levels of government workers than wages.

Findings by Organizational Level

Given the vast complexities and variations across the sample, the dataset is next analyzed by the respondents' organizational level. The findings in Table 2 are differentiated between the respondents in a supervisory role and those in a nonsupervisory role. A comparison of the efficiency wage ratio across countries shows different patterns. The American government respondents in a nonsupervisory position were better paid than their private counterparts in a similar position. But this trend is reversed at the supervisory level. The respondents in a supervisory position appeared to receive lower wages in the public sector than private sector. For other countries, such as Great Britain, government employees in nonsupervisory positions received slightly lower wages, while those in supervisory positions received slightly higher wages than their private sector counterparts in a similar position. There are also countries in which the respondents show a similar sectoral wage gap across job levels. For some countries, such as Australia, the government respondents in both supervisory and nonsupervisory positions were slightly better paid than their private sector counterparts in similar positions. For other countries, such as Denmark and France, government workers in supervisory and nonsupervisory positions received lower wages than those of private sector workers in similar positions. For some countries, such as Canada and New Zealand, the wage gap between the government workforce and private sector workers appeared to narrow slightly when one moves from a nonsupervisory to a supervisory position.

Table 2. Efficiency Wages and Elasticity Values of Full-Time Government Employees in Nonsupervisory (Low) and Supervisory (High) Positions

	Efficiency wage ratio		e		ef	
Country	low	high	low	high	low	high
United States (*N* = 101, 49)	1.16	0.36	0.22	0.19	0.63	0.73
Canada (*N* = 94, 94)	1.10	1.04	0.22	0.21	0.61	0.51
Great Britain (*N* = 43, 48)	0.97	1.16	0.23	0.23	0.61	0.60
Denmark (*N* = 249, 119)	0.87	0.86	0.18	0.18	0.61	0.61
France (*N* = 156, 115)	0.89	0.88	0.23	0.22	0.59	0.59
Germany (*N* = 62, 67)	1.21	1.16	0.24	0.23	0.61	0.60
Spain (*N* = 38, 16)	1.23	1.18	0.33	0.32	0.68	0.64
Bulgaria (*N* = 86, 43)	0.86	0.72	0.40	0.37	0.69	0.68
Slovenia (*N* = 67, 33)	1.10	1.28	0.18	0.18	0.60	0.60
Russia (*N* = 79, 79)	0.75	0.79	0.26	0.25	0.60	0.63
Israel (*N* = 52, 59)	1.10	1.14	0.27	0.26	0.64	0.64
Japan (*N* = 42, 3)	1.46	0.88	0.28	0.26	0.58	0.61
Taiwan (*N* = 121, 41)	1.34	0.97	0.22	0.21	0.60	0.62
Australia (*N* = 106, 106)	1.09	1.07	0.21	0.21	0.59	0.62
New Zealand (*N* = 99, 92)	1.09	1.02	0.22	0.21	0.60	0.61
Average	1.08	0.97	0.25	0.24	0.61	0.62

Note: The figures in parentheses indicate the number of respondents at nonsupervisory positions followed by that at supervisory levels. e = elasticity of effort; *ef* = elasticity of PSM; *N* = number of public sector respondents.

There are slight variations in the *e* and *ef* values of the public sector workforce as one progresses from nonsupervisory to supervisory positions. Taking the American sample as an example, the relatively lower *e* value at supervisory positions suggests that employees in nonsupervisory positions required a slightly greater change in wages to bring about 1% change in their effort level compared to those in supervisory positions. The higher *ef* value at the supervisory than nonsupervisory positions implies that PSM accounts for a greater change in the effort level for those in supervisory than nonsupervisory positions.

Discussion

This article attempts to develop a model to explain the complex relationships between wages, PSM, and effort among the public sector workforce. The model, which was piloted on government employees from 15 countries, presents five prominent findings. First, government employees from many countries are found to receive an efficiency wage. The full-time public sector employees in the countries studied appeared to receive

higher wages than their private sector counterparts, thus dispelling the view that government employees are generally underpaid compared with private sector employees. Countries that failed to meet the efficiency wage specification in the public sector are United States, Denmark, France, Bulgaria, and Russia.

This finding of the American sample can contribute to the debate about the wage gap between the public and private sectors (Parker, 2010; Rosenberg, 2008). Although a report by a staunchly conservative Washington think tank acknowledged that federal government employees in some highly skilled occupations earned less than they would in the private sector, it asserted that the American federal workers received significantly higher salaries than their private sector counterparts (Sherk, 2010). This study, which is not confined to federal government employees, displays a different pattern. Importantly, our analysis found that American respondents in nonsupervisory positions earned more than their private sector counterparts, but those in supervisory positions received wages less than they would in the private sector. Our findings support those of Donahue (2008), who argued that lower level employees in the U.S. public sector are well-compensated, compared with those in the private sector, but at higher levels, this trend is reversed with higher wages in the private sector than the public sector. This study also found that despite being paid less than they would in the private sector, government respondents in supervisory positions show higher *ef* values than those in nonsupervisory positions who are paid more than their private sector counterparts. This study shows that PSM appears to be more important to the respondents at supervisory or higher levels than those at nonsupervisory or lower levels in that the effort levels of the former group are shaped to a larger extent by PSM than those of the latter group.

Second, the positive relationship between wages and effort, as shown in the positive values in the elasticity of effort with respect to wages, *e*, supports the literature on the motivating effects of wages on performance among government workers (Crewson, 1997; Gabris & Simo, 1995). They show that wages are important to many government workers (Rainey, 1982). As mentioned earlier, wages possess instrumental and symbolic properties. In the latter case, wages can serve as an acknowledgement of employees' work effort and their high intrinsic work motivation. Moreover, the fact that pay for performance schemes are widespread in the public sector despite the substantial empirical evidence showing that these schemes are either meaningless or dysfunctional in the public sector (Heinrich, 2007; Perry et al., 2009) would suggest that public sector compensation policies possibly have important symbolic value to both government officials and citizens. The public sector wage system can be viewed as a means to hold government officials accountable and ensure that they are working hard.

Third, the high value in the elasticity of PSM with respect to effort, *ef*, confirms the significance of PSM in shaping effort. This research supports previous research that PSM is strongly linked to desirable behavioral consequences in the form of high performance (Alonso & Lewis, 2001; Brewer & Selden, 1998; Bright, 2000; Naff & Crum, 1999).

Fourth, despite the finding of the motivating properties of wages, this study shows the relative importance of PSM in raising the effort levels of government employees.

For all countries studied, the elasticity of PSM with respect to effort, *ef*, is estimated to be greater than the elasticity of effort with respect to wages, *e*. Taking the American public sector workforce as an example, on average, .68% increase in PSM contributed to 1% rise in their effort. In comparison, .20% rise in wages accounted for 1% increase in their effort. The higher *ef* value compared with the *e* value suggests that PSM is a more cost-effective way to raise government employees' effort than wages. Staff wages usually represent a major expenditure for many firms and governments. The White House, for example, recently paid out about US$39 million in salaries to its 470 employees (Long, 2010). Many managers in the public sector face "the principal's moral hazard constraint" in which bonuses large enough to bring about the incentive effect are considered to be prohibitively expensive (Miller & Whitford, 2007). Davis and Gabris (2008) also noted that the idea of paying public employees a high wage is likely to be a hard pill for some elected officials and members of the public to swallow. Therefore, PSM presents an attractive complementary mechanism that can be used to motivate staff to higher performance, particularly when it is found to impact on effort to a larger degree than wages.

Fifth, the different values of *e* and *ef* across the 15 countries highlight the varying emphasis placed on wages and PSM as a driver of effort by the public sector workforce in different countries. The public sector workforce from Spain and Bulgaria, for example, required a greater change in wages than those in Denmark to change their effort by a similar amount. Similarly, government workers from United States and Israel appeared to be more driven by PSM to raise their effort than their French and Japanese counterparts.

The results of the American respondents are worthy of special mention. Although their efficiency wage ratio of .60 is the lowest among the 15 countries, they require a smaller change in wages to raise their effort than some of their foreign counterparts with relatively higher efficiency wage ratio, such as Great Britain and Germany. In addition, their *ef* value of .68 is significantly higher than the 15-country average of .62. In fact, it is higher than that of any other country. The effort levels of the American public sector workforce appear to be most profoundly shaped by PSM. Notably, the results suggest that wages account for a relatively small proportion of the American group's output in the form of effort put forth.

Given the above findings, it is hoped that this research will encourage others to investigate the complex relationship between wages and PSM in affecting government employees' actions. Further research can examine other aspects of the public sector compensation system, such as promotional opportunities, on employees' performance. This research has examined the effects of wages on the level of worker effort. Further research can investigate the effects on the quality of effort. There is also value in analyzing other behavioral outcomes of wages and PSM, such as absenteeism, turnover, and whistle-blowing. Using the U.S. Merit Systems Protection Board data on federal employees since 1980, Near and Miceli (2008) found that whistle-blowers generally receive higher wages. Retaliation was also found to be inversely related to wages received. Miceli and Near (1992) concluded that employees who are relatively powerful and blow

the whistle are less likely to suffer retaliation than those who are less powerful, with power measured by demographic variables (and include wage level) and perceived support from others. It is thus possible for wages to interact with PSM in determining the incidence of whistle-blowing activities of government employees.

This study is subject to a few shortcomings. The first relates to the small sample size. This model is piloted on a small group (9,961) of full-time public sector employees. This small size is particularly prominent when the analysis is conducted at the respondents' organizational level. Although the ISSP dataset is assumed to represent a representative random sample of a country's citizens based on its multistaged stratified random sampling method, a good sample would include some or all of the following: different levels of government (central, regional, and local), different levels of the hierarchy (executives, middle managers, and street-level bureaucrats), different occupations (e.g., sanitation workers, military personnel, social service workers, regulatory bureaucrats, etc.), and different demographic groups (age, race, gender, religion, etc.). Many of these variables are not available in the dataset, making it difficult for us to verify the robustness of the sample. The second limitation involves the use of cross-sectional data, which cannot be subjected to time series analysis. The third pertains to the reliance on preexisting survey research data. In particular, the findings are constrained by the items used to determine PSM. Although our proxy of effort has been used in efficiency wage research, the fact that we use a proxy for effort rather than a direct measure should be noted as a limitation of this study. Future research should be conducted on a larger sample size, across time, and with stronger and established measures of PSM, notably Perry's PSM instrument (Coursey & Pandey, 2007; Perry, 1996, 1997; Vandenabeele, 2008). Nevertheless, the findings in this study support the descriptive literature and empirical studies containing assertions about the significance of PSM in the public sector workforce. Although wages and PSM both possess motivational properties, the effort levels of many government workers, especially those at supervisory levels, seem to be affected more by PSM than wages.

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