Economic Analysis of Moonlighting in Higher Education Institutes of Khyber Pakhtunkhwa

Noor Jehan
PhD Scholar, Institute of Development Studies
University of Agriculture, Peshawar, Pakistan
&
Himayatullah Khan
Institute of Development Studies
University of Agriculture, Peshawar, Pakistan

Abstract

The main objective of this study is to investigate the determinants of moonlighting in public sector universities of KP. A multi-staged sampling was used for data collection. In the first stage, the population was stratified into rural, semi-urban and urban universities and 9 universities were purposively selected. In the second stage, in each selected university teaching faculty was further stratified into Professors, Associate Professors, Assistant Professors, Lecturers and Teaching Assistants. In the third stage, a sample of 656 faculty members was selected using simple random sampling and proportional allocation method. Binary Logistic regression model was used as the dependent variable was of dichotomous nature (moonlighting vs. no moonlighting). Wage rate of second job, accumulative wage of more than one second jobs, employment status and cadre, hours of work at second job, location and marital status were found significant in determining moonlighting. Based on its findings, the study recommended that moonlighting may be encouraged which may not only enhance moonlighter's income but also their efficiency. The study also recommended that studies on moonlighting in other sectors may also be conducted which could help policy planners, researchers and other stack holders.

Keywords: Moonlighting; Wage differentials; Logistic regression; Pakistan.

Introduction

Due to the dynamic nature of environmental factors, more flexible market situations are created which has impacted the employee and employer relations in terms of loyalty, higher risk of loss of employment as well as smaller work contracts (Harrison, 1998; and Gregg and Wadsworth, 1995; 1999). These factors have changed the behavior of labour as well. They now look for more ensured jobs, more secured employment, and earning of continuous and more income flow resulting in occupational mobility (Gregg and Wadsworth, 1996). The Employees have also adapted to such situations by various strategies. One of such strategies is moonlighting.

Moonlighting[1] is the result of hours' constraint on primary job. It is believed that low satisfaction level (earning less than reservation wage[2]) of first job causes a rational worker to go for a second job in order to maximize his/her utility and household income. According to Boheim and Taylor (2004) there are four motives which cause employees to moonlight. Firstly, it is suggested by standard model that employees are hour constrained on their primary job i.e. first job, due to which they cannot earn above it and so moonlighting is done for financial motives. Standard labour-leisure model assumes that people/workers willingly supply more labour but the work is not offered by the employer in primary job (Perlman, 1966; Conway and Kimmel, 1998). As most of the firms have policy of offering a fixed level of pay and work hours (Shishko and Rostker, 1976), any work policy which is divergent from an optimal hour of work as perceived by a utility maximizer worker at his/her given wage will induce him/her towards moonlighting conditioned upon a second job wage which is above his/her reservation wage at first occupation. Secondly, there is another situation in which employees come across unwanted financial jolts (shocks) which may motivate them to look for a second job as an alternative source of precautionary savings (Guariglia and Kim, 2004). Thirdly, there is job portfolio motive where the heterogeneity is the main motive when an employee derives different utilities from primary and secondary jobs. This decision does not relate to hours constraint on first job but a desire for different job experience and hence diversity. The supply of labour hours in both first and second job are not the perfect substitutes and the second job is undertaken for reasons other than first job labour work hours (Böheim and Taylor, 2004). Lastly, the fourth motive is mostly related to job insecurity and second job, thus, is taken as an insurance device to cope with the risk of loss of the primary job. It is also a mean of human capital diversification suggested by Panos, Pouliakas and Zangelidis (2009). It is most likely that individual may change job due to skill transferability because of perfect information (Shaw, 1987). According to this study, moonlighting is positively related to the total income of household. It can be thought that wealthy people moonlight with an increase in total income to satisfy their aspirations. While low income class increases moonlight with the fulfillment of their needs.

[1]Berman and Cuizon (2004) have defined moonlighting as a situation in which an individual having a primary full-time job also has at least one additional job.

[2]Reservation wage refers to that lowest wage rate at which a worker is willing to accept a job. In other words, if such job is offered which involves similar type of work and the similar working conditions, but wage rate is lower, would be rejected by the worker.

Teacher's Moonlighting

There are various definitions of teaching moonlighting in education literature. One of such definitions is given by Burch (1966) and Stewart (1981) as working outside the school for payment during the school year. A modified definition of moonlighting is given as additional salary earned while working outside the school when the session is off (Tucker, 1965); while there is another updated definition which states that moonlighting refers to any work which is aimed at additional compensation within or outside the school at any time of the session (Williams, 1992). Williams defines moonlighting in teaching as "compensation for work either inside or outside the school setting." Any additional work even at the same work site is considered as a second job. It is considered that the income earned by moonlighting in teaching is considerably small, but it contributes significantly towards the socioeconomic development of teachers (Wisniewski and Kleine, 1983). The wage growth remains relatively low in Pakistan. Real wages have been falling for more than a decade in Pakistan (Shah, 2014). Although, there has been a 0.7% increase in real wage rate in two decades in Pakistan, but the cost of living has increased manifold. The price hike and salary rigidity has intensified labour efforts to meet livelihood needs on one hand and market demand of labour on the other. The labour market is also saturated as jobs are difficult to find and the job structure has also been diversified in terms of regular, contract, ad-hoc and daily wages in public sector. Similarly, labour on their own part has also tried to cope with these demands (Hyder and Ahmed, 2009).

It is the case in most of the education institutes that those teachers who are practicing more than one job have been thought of as profit maximizer. It is assumed by the agency theory that profit maximization is the ultimate purpose of agents and work effort is the representation of cost accrued to them, hence there is a tendency to minimize work effort (Laffont, 2003). Similarly, there is also an observation that moonlighters have developed negative behavioral attitude in the first job (Biglaiser and Ma, 2007) due to which their performance can be affected. Teaching in Pakistan has been allotted prescribed credit hours based on teaching cadre like twelve credit hours per week for lecturers, nine to assistant professors and so on. The reason for setting such prescribed hours is that teachers at higher levels are required to give additional time to preparation, research supervision at M.Phil and PhD levels, grading, and professional development as per the need of students and institute. The phenomenon of moonlighting has not been well researched in Pakistan in a pure economic perspective and there are very few studies conducted in Pakistan related to the issue of moonlighting. There is a need for a thorough investigation of this very important issue. Such studies may provide guidelines for all those who may be interested to know the causes of double jobs undertaken by most teachers in

public sector universities in KP. As the percentage of people working more than the stipulated hours (50 hours per week) is high in KP's education sector as compared to other provinces of Pakistan, its results can be very beneficial to other provinces. In order to fill this gap, the present work is a pioneering one which empirically investigates the determinants of moonlighting in KP's higher education sector.

Research Methodology

All public-sector universities constitute the universe of this study and all faculty members of these universities are the target population. In order to select a representative sample, a multi-stage sampling is used. In the first stage, the population is stratified into rural, semi urban and urban universities and nine (9) universities are purposively selected from all these public-sector universities of KP. These include Khushal Khan University Karak, Islamia College University Peshawar, University of Malakand, Bacha Khan University Charsadda, University of Engineering and Technology Peshawar (Mardan campus), University of Haripur, University of Swabi, the University of Agriculture Peshawar and Khyber Medical University Peshawar. The data of faculty of the selected universities was taken from the offices of the registrar. In stage two, each of the selected universities was further stratified according to the designation of the faculty members i.e. Professors, Associate Professors, Assistant Professors, Lecturers and Teaching Assistants. From each stratum, a sub-sample of individuals was selected using simple random sampling. Then, proportional allocation method was followed to select respondents from each category in each university. The following sample size selection formula was used for sampling in first stage in which the number of respondents for each category of teachers was calculated (Mwakaje, 2013).

$$n = \frac{N}{1 + Ne^2} \quad \text{..... (1)}$$

Where

n = required sample size

N= Population

e = margin of error which is 5% in this case

In order to select sample from each university, proportional allocation method was applied (Chaudhry, 2008).

$$n_i = \frac{N_i}{N} n \quad \text{..... (2)}$$

Where n = the required sample size which is randomly selected from the public-sector universities.

N = the total number of teacher the population size (N= 1286).

N_i = Number of teacher in individual category in each university.

n_i= Number of teacher in individual category to be selected from each university.

Out of the total population (1286), a sample of 656 faculty members was selected from the 9 selected universities. Out of the total sample, the number of Professors was 98, Associate Professors 60, Assistant Professors 195, Lecturers 246 and Teaching Assistants 67, respectively.

THEORETICAL FRAMEWORK

There are various frameworks towards the study of moonlighting. Broadly two, economic or financial perspective, were presented by Shisko and Rostker (1976) as a tradeoff for free time for wages, and individual or dispositional as choice between moonlighting and other choices under situations of economic needs (Allen, 1998). The underlying assumption is that an individual's labor supply decisions to either first or second job or both are out of utility maximization principle although the supply of labor may not be similar in first and other jobs. Let us suppose labour hours supplied to the first job is designated by H_1, on the second job H_2, L as hours of leisure. Hence the utility function may be written as following, subject to the budget constraint (PX) and time constraint 24-L

Mathematically:

Max U (C, H_1, H_2, L) ...…….…….... (3)

Subject to the condition:

PX = Y= C = W_1H_1 + W_2H_2 +A, whereH_1+ H_2= 24 – L ……. (4)

Where

C denotes consumption

A denotes unearned income

W_1 wage in first job and W_2 wage in second job respectively.

If the work effort on either job does not provide any (dis)utility beyond the supplied labour or in other words the foregone leisure, then equation 3 is simply the standard leisure/consumption utility function.

Max U ($W_1\bar{h}_1$+ W_2h_2+ A, $\bar{h}_1$, H_2, 24 - $\bar{h}_1$ - H_2) …..……. (5)

This equation, on further solution, results into the optimization equation showing condition between the reservation wage and market wage.

(U_2 – U_l)/ U_c = -W_2.....…….…… ….. (6)

and solution of H_2 gives moonlighting equation

$H_2 = H_2^c(W_2, A + (W_1 - W_2)H_1, H_2^-)$ ..... (7)

In case of unconstraint employee, the utility maximizing behavior becomes:

$(U_2 - U_l)/ U_c = -W_i$ for i = 1, 2 ..... (8)

Majority of the moonlighting researches are based on utility maximization principle, showing that equality between negative wage of a job and the ratio of marginal disutility of another hour and marginal utility of income is the condition for supply of labour to it i.e.

$H_i = H_i^u(W_1, W_2, A)$ for i = 1,2..... (9)

Hours Constraints view of Leisure–Choice theory

This theory is based on the pioneering work of Shishko and Roskter (1976) that extended the standard labour supply model. The labour-leisure model is based on the notion that employees want to work more but they are not given the choice to do so and hence they are hours' constraint (Perlman, 1966). As individuals are constraint on their first job, they resort to do a second job to maximize their utility based on the principle that the second job pay is more than the employee reservation wage. Figure 1 clarifies this idea. Here Y is taken as non-labour income, t as total time available, w_1 and w_2 wages at first and second job, respectively; H_1 shows fixed hours worked at first job and H_2 hours work at second job. As the individual is time constraint, he/she cannot work more than H_1 hours although is desirous to work $T-H_1-H_2$ in order to maximize his/her utility from first job at I^* Utility level. The intersection of first job wage line and I_1 utility level shows the wage offered in second job. The utility maximizer individual will take on second job if his/her reservation wage is less than its second job wage and hence will attain a higher utility level at I^*. Teachers in university are constrained to a certain credit hours of class room lecture fitting this case.

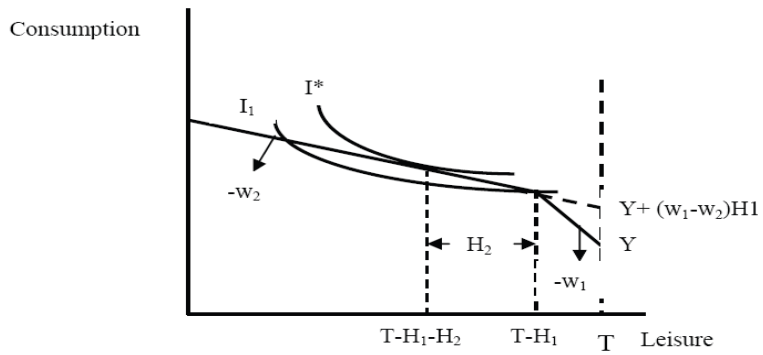

Figure 1: Utility Maximizing Hours-Constraint Moonlighter
Source: Dickey,Verity, and Alexenddros(2011).

Heterogeneity of Job or Job Portfolio View of Leisure-Choice Theory

There is another case of moonlighting for non-pecuniary reason when the individual may not be constrained on her/his main job. For instance, learning about new skills and occupation (Heineck and Schwarz, 2004), for precautionary savings (Guariglia and Kim, 2004a), maintaining flexible work schedule or job satisfaction as heterogeneity (Heineck, 2003). There is an individual preference that matters in moonlighting decision making. Figure 2 shows a situation of non-constrained moonlighter. He/she is free to work ($T-H_1$) hours of standard working hours. The supply to second job is still subject to higher wage of second job like a Professor taking a consultancy. The point is shown as $T-h_1-h_2$.

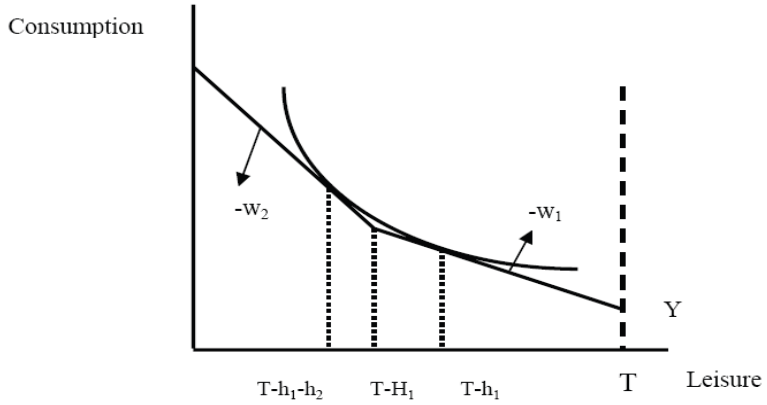

Figure 2: Utility Maximizing Non-Hours-Constraint Moonlighter
Source: Dickey,Verity, and Alexenddros (2011)

When the motives behind dual job holding are examined, it can provide evidence related to elasticity of labour supply in relation to wages as well as the prevalence and effects of constraints on this supply. An instance may be of a university professor who, while having a primary job, goes for a second higher paid job in the form of a consultancy or a doctor doing practice on private clinics to earn higher incomes. But it's not necessary; working on a second job may be a mean for pleasure. Like a musician who performs at night although possess a regular first job with considerable pay. This is the case of non-pecuniary (monetary) benefits of second job. There can be cases when non-pecuniary benefits cause an employee to take on two jobs (Conway and Kimmel, 1998). These facts were recognized by Shishko and Rostker (1976) for the first time while Lilja (1991) undertook an exploratory study to know its theoretical and empirical realities.

Econometric Model of Moonlighting

The present study employed logistic regression for the estimation of factors affecting moonlighting. As the data included dichotomous dependent variable i.e. the moonlighting and no moonlighting activity of university teacher, and independent variables are not interval as well as variation is supposed to be unequal (variance), logistic regression best fits the requirements. Similarly, other assumption of mutually exclusive and exhaustive categories and large sample (50 cases per predictor) is also met by the data. It uses maximum likelihood method of estimation by maximizing the probability of classification of the observed data into appropriate categories with given regression coefficients based on asymptotic theory.

Mathematically

$$\mathbf{logit}(p) = log\left[\frac{p}{(\mathbf{1}-p)}\right] = ln\left[\frac{p}{\mathbf{1}-p}\right] \quad \text{..... (10)}$$

Where logit (p) is the log to the base e. It shows the log of the odds ratio. It is also the maximum likelihood ratios showing that the dependent variable is 1.

The range of p is between 0 and 1 while logit (p) ranges from negative infinity to positive infinity. The symmetry occurs at logit of .5 i.e. zero.

The following equation shows the relation between logistic regression equation and simple regression equation

$$\text{logit}\,[p(x)] = \log\left[\frac{p(x)}{1\text{-}p(x)}\right] = b_i \sum_{i}^{k} X_i + u_i \quad \text{.....(11)}$$

Although both equations are the same, the goodness of fit and overall significance of the statistics used in logistic regression is different. Rearrangement of equation (10) gives equation (11) which can be used to estimate p as:

$$p = \frac{exp^{(a_1 + b_1x_1 + b_2x_2 + b_sx_s \ldots)}}{1+\exp^{(a_1 + b_1x_1 + b_2x_2 + b_sx_s \ldots)}} \quad \text{.....(12)}$$

The p is the probability of a case in a particular category, exp is the base of natural logarithms (almost 2.72), a is the constant and b the coefficient of predicted variables. Equation 13 is a generalized linear model with binomial errors and link logit.

Our model for finding the significant factors (causes) of moonlighting will be:

$$\log \frac{prob\,(moonlighting)}{prob(no\ moonlighting)} = \boldsymbol{X\beta} + \mathbf{u_i} \quad \text{...} (13)$$

Or

$$\frac{prob(moonlighting)}{prob(no-moonlighting)} = e^{\mathbf{X\beta+ui}} \quad \text{...} (14)$$

If p is taken as moonlighting, equation (14) can be rearranged for finding the effects of the independent variables on moonlighting.

Prob (Moonlighting) = $\frac{e^{X\beta+ui}}{1+e^{X\beta+ui}} = [1+\exp(-\boldsymbol{X\beta})]^{-1} + u_i$ .... (15)

Where X is a vector of independent variables and β is a column vector of regression coefficients. As we are assuming a case of university teachers who are constrained by hours of class room lectures, our primary case is for financial motive. For empirical analysis of financial motives, the model will be estimated with the following independent variables.

Variables of the Moonlighting Model

The wage in primary job, wage in secondary job, experience in number of years of first or main job, age, age square, number of children and dependents in home in case of married and number of dependents in case of unmarried were continuous variable in this research.

Wages are the primary determinant of moonlighting as is found by various researches and that is why it is assumed to be a possible cause in present case as well. Wages were represented by wage rate i.e. wage per hour. The wage of first job divided by 30 resulted into wage per day which was transformed into wage per hour in order. This was done in order to show wages of both jobs in similar manner. The second jobs are mostly paid on hourly basis. As the experience increases, a person becomes aware of job market as well as his networking is increased and hence he can find second job easily. Age has been found to affect moonlighting in two ways. The second job is taken for monetary purposes in young ages and for heterogeneity of jobs in old ages that is why it is taken as independent variable. Age square is taken as a representation of convexity or concavity of the relationship between age and moonlighting to confirm the results of age. Number of children is basically the representation of increase expenses, and a married person is assumed to increase his income. Dependents are taken in consideration based on our societal norms. We care and live with our parents and young brothers and sisters. Most of the times, unmarried people contribute towards family income and there is less remaining for their future saving. So, if a person is contributing to family dependents, he may moonlight to increase his future savings.

Education level as defined by degree, job grade, gender, location of job i.e. urban or rural, marital status, spouse job status and employment type whether regular or contract. As the level of education increases, a person becomes more valuable to the job market. His demand increases and there is a propensity to supply his labour based on demand. Low graded teachers may get less income and are assumed to moonlight. Higher grade may moonlight, the reason may vary. Urban areas like Peshawar has many private universities which are based on cost minimization and they offer visiting jobs due to which there is a great likelihood of moonlighting as compared to rural areas. Contract employees are more insecure in job and they are representation of moonlighting for job insecurity reasons. Marital status increases household expenses and it requires more income and spouse job status can affect moonlighting decision as well. The model can be written as:

$$\text{Prob}\begin{pmatrix} 1\ if\ moonlighting \\ o\ if\ not\ moonlighting \end{pmatrix} = e^{(\alpha+\beta_1 w_{1i}+\beta_2 w_{2i}+\beta_3 w_{3i}+\beta_4 exp_i+\beta_5 age_i+\beta_6 ags_i+\beta_7 dep_i+\beta_8 TA_i+\beta_9 D_{1i}+\beta_{10} D_{2i}+\beta_{11} D_{3i}+\beta_{12} D_{4i}+\beta_{13} D_{5i}+\beta_{14} D_{6i}+\beta_{15} D_{7i}+\varepsilon_i)} / 1 + e^{(\alpha+\beta_1 w_{1i}+\beta_2 w_{2i}+\beta_3 w_{3i}+\beta_4 exp_i+\beta_5 age_i+\beta_6 ags_i+\beta_7 dep_i+\beta_8 g_i+\beta_9 D_{1i}+\beta_{10} D_{2i}+\beta_{11} D_{3i}+\beta_{12} D_{4i}+\beta_{13} D_{5i}+\beta_{14} D_{6i}+\beta_{15} D_{6i}+\beta_{16} D_{7i}+\beta_{17} D_{8i}+\beta_{15} D_{9i}+\varepsilon_i} \quad \ldots\ldots(16)$$

Taking natural log on both sides, equation 7 becomes:

$$\ln (p/q) = \alpha + \beta_1 w_{1i} + \beta_2 w_{2i} + \beta_3 w_{3i} + \beta_4 exp_i + \beta_5 age_i + \beta_6 ags_i + \beta_7 dep_i + \beta_8 TA_i + \beta_9 D_{1i} + \beta_{10} D_{2i} + \beta_{11} D_{21i} + \beta_{12} D_{3i} + \beta_{13} D_{4i} + \beta_{14} D_{5i} + \beta_{15} D_{6i} + \beta_{16} D_{7i} + \beta_{17} D_{8i} + \beta_{15} D_{9i} + \varepsilon_i \quad \ldots\ldots(17)$$

Where p is the probability that the respondent will moonlight, and q is the probability that he will not moonlight. Moonlighting (moonlighting refers to any work which is aimed at additional compensation within or outside the school at any time of the session (Williams, 1992; Wisniewski and Kleine, 1983) which does not directly relate to teaching at university level. It does not include incomes from property.

w_1 = wage rate of first job
w_2 = wage rate of second job
w_3 = Accumulative wage of more than one second jobs
exp = experience (number of years)
age = age (years)
ags = age square
dep = number of dependents
D_1 = Dummy for sex where 1 = male and 0 otherwise
D_2 = Dummy for location where 1 = urban and 0 otherwise

D_3= Dummy for location where 1 = rural and 0 otherwise
D_4 = Dummy for marital status where 1 = married and 0 otherwise
D_5 = Dummy for spouse job where 1 = on job and 0 otherwise
D_5 = Dummy for employment status where 1 = regular and 0 otherwise
D_6 = Dummy for degree where 1 = masters and 0 otherwise
TA = Dummies for Teaching Assistant where 1= Teaching Assistant and 0 otherwise
D_7 = Dummy for Lecturer where 1 = lecturer and 0 otherwise
D_8 = Dummy for Assistant Professor where 1 = Assistant Professor and 0 otherwise
D_9 = Dummy for Professor where 1 = Professor and 0 otherwise

Logistic Regression

Logistic regression model was estimated using STATA9. The coefficients were reported in place of odd ratios because it is easier to understand and interpret coefficients than odds ratios. The estimated coefficients are given in Table 1.

Estimated Coefficients of Logistic Regression Model

Table 1 shows the estimated coefficients of the estimated logistic regression model. It shows that 62% of the variation in dependent variable (moonlighting) is predicted by the explanatory variables. The likelihood Ratio value showed that the overall combination of independent variables is significant. As far as the individual effects of these variables are concerned, the results were not similar. Some variables were significant in their effect and some were not. The individual effect of age was found statistically insignificant. The relation, though, was negative. We can say that moonlighting decreases with increase in age. With the passage of time (age), people are more specific and directed towards needs fulfillment both in pecuniary and non-pecuniary sense. Similarly, an inverse relation was found for age square variable, and hence it can be inferred that age has a linear relation with moonlighting. The effect of both age and age square were, however, found insignificant statistically. Gender was a dummy variable in this research. The reference category was male. The relation was found negative and insignificant. When it comes to professional work, there is no such difference between a male and female teacher. They teach to the same class and combination of students. Hence gender has no effects on moonlighting. The marital status was also a dummy variable and reference category was married. The result was significant at 10%. The result showed that if a person is married, he or she will moonlight more by 1.034. It may be due to the psychological effect as a married person may perceive his needs increment and decide to moonlight. The status of working spouse was inversely related to moonlighting but the result was insignificant. Master degree was taken as reference for education level as master is the basic required education for entry level job in university, like

lecturer. The effect of degree (Master) as a proxy for education was found insignificant in this research towards effecting moonlighting. Hyder and Ahmad (2013) also found education as insignificant. Moonlighting is a voluntary action and it is not linked with a higher level of education as such. It is not necessary that a higher degree will induce a faculty to moonlight. The effect of experience was found to be negative in relation to moonlighting, but it was statistically insignificant. So, moonlighting can decrease with increase in experience but not significantly. It is not just an increase in experience, but an increase in wage and opportunity for new task at primary job. If a need is satisfied at the primary place of work, then what is the need to look around. The contract based job was reference category for mode of job variable in this research. It was found out that contract employees moonlight more than regular employees. This result is in agreement with the results of Heinck and Schwarze (2004) and Kimmel and Powell (2001). Contract employment is linked with job security insurance, as well as financial motives behind moonlighting and logically proves to be a valid reason for it. Number of dependents had a positive relation with moonlighting as suggested by findings of this study. An increase of one dependent would result into increase in moonlighting by 0.368 units. Earlier in 2011, Dickey, Verity and Alexenddros (2011) and Kimmel and Powell (2009) also found that children and dependents have positive effect on moonlighting. An increase in dependents necessitates more financial resources and overtime is one strategy for extra earning. There were five job scales viz. Teaching Assistants, Lecturer, Assistant Professor, Associate Professor and Professor. For these, four dummies were used. Teaching Assistant is the lowest category in teaching in university. It is not a structured job but a special category present in some of the sampled institutions. The relation of a Teaching Assistant with moonlighting was found statistically insignificant and positive. Though a Teaching Assistant has a positive tendency towards moonlighting, but it was found insignificant. The reason could be non-popular scale of Teaching Assistant. The result for a lecturer scale was found opposite to Teaching Assistant. The relation of a Lecturer towards moonlighting was found statistically significant at 10% significance level. A lecturer would decrease moonlighting by 1.08 as suggested by these results. An Assistant Professor was found to decrease moonlighting by 1.45 units (at 5% significant level). A Professor had positive and insignificant tendency towards moonlighting. Scales have mixed response towards moonlighting. Teachers in lower and higher scales (Teaching Assistant and Professor) had positive effect but insignificant towards moonlighting, while teachers in middle scales of Lecturers and Assistant Professors had inverse and significant effect on moonlighting. It can be claimed that lower scales may moonlight for monetary reasons and higher for heterogeneity of jobs. It can also be said that teachers in high ages may moonlight for non-monetary reasons and young teachers moonlight for monetary reasons. This study introduced three locations, Urban, Rural, and Semi Urban.

Two dummies for rural and urban locations were used in estimation. The result revealed that urban location is highly significant in effect towards moonlighting and that faculty who work in urban location moonlight more. Though there is competition in urban areas, there are a lot of opportunities as well and that is the reason that moonlighting may increase in an urban setting. There is another reason as well. Cost of living is comparatively high in urban locality and faculty may opt to moonlight to fulfill financial requirements. Baah-Boating, Adjei, and Oduro (2013) and Zhongmin, Balmbridge and Zu (2009) have also reported similar results for location. As far as rural location is concerned, the effect was statistically insignificant. Primary job wage rate was found insignificant in effect towards moonlighting and secondary job wage rate was highly significant in its effect. With a one unit increase in secondary wage rate, moonlighting was found to increase by 0.013 units but earning from all sources (services of own labour) was found inversely related to moonlighting. In the very earlier study on moonlighting, Shishko and Rostker (1976) found the same result for second job wage rates while similar were the results by Zhongmin, Balmbridge and Zu (2009) for second wage towards moonlighting. The strong predictor towards moonlighting is secondary job wages which induces to moonlight. Hours of work at second job was found to have positive relation with moonlighting and an hour increase in second job work hour was found to increase moonlighting by 0.3 units. Hours of second job are important for payment is made on hourly basis and not on monthly basis. Secondly, there is no constraint on second job working hours and one can earn up to one's own ability and management. That is also comparable to hour constraint on main job. We can say if a teacher is constraint on main job for working hours, he/she may find it attractive to work in second job up to manageable limit of working hours.

Table 1: Estimated Coefficients of Moonlighting using Logistic Regression Model

Moonlighting	Coef.	Std. Err.	Z	P>z
Age	-0.014	0.213	-0.07	0.948
sex /Gender	-0.63	0.459	-1.38	0.169
Marriage	1.034	0.556	1.86	0.063**
Spouse working	-0.020	0.433	-0.05	0.962
Education (Master)	0.334	0.462	0.72	0.470
Experience	-0.083	0.050	-1.64	0.100
Mode of Mode	1.111	0.407	2.73	0.006*
Number of dependents	0.368	0.125	2.94	0.003*
Teaching Assistants	0.023	0.864	0.03	0.979
Lecturers	-1.08	0.569	-1.90	0.057**
Urban Location	1.826	0.497	3.67	0.000*
Rural Location	0.07	0.540	0.13	0.897
Primary wage rate	0.0001	0.0002	0.56	0.572
Second job work hours	0.298	0.0398	7.50	0.000*
Secondary wage rate	0.0133	0.0015	8.86	0.000*
Professors	0.693	0.786	0.88	0.378
Assistant Professor s	-1.450	0.576	-2.52	0.012*
Earning from all secondary sources	-0.000009	0.000002	-4.96	0.000*
Age square	-.0015598	0.0028	-0.56	0.577
_cons	-3.654636	4.168	-0.88	0.381

Source: Survey

Note: * refers to significance at 5% and ** shows at 10% respectively.

LR $Chi^2(19)$ = 400.26, Prob> chi^2 = 0.000

Log likelihood = -124.11 Pseudo R^2 = 0.617

Assessment of the Moonlighting Model

There are various diagnostic tests which provide us proof that the model we have estimated is acceptable on a scientific base. For logistic regression, some diagnostic tests were performed in this connection. One of these was link test which is used for checking model specification; Table 2 shows the results. Logistic regression model assumes that logit of the outcome variable is a linear combination of the independent variables. Two aspects are involved in this. The

outcome variable, on the left-hand side, is correct function and we have included all the relevant variables (right hand side) and logit as a function is a linear combination of the predictor variables. If these conditions don't apply, we may have a specification error. The linear predict value i.e. _hat and the square of linear predicted value (_hatsq) are two parameters for checking specification. The value of _hat must be significant for it is the predicted value from the model. While the _hatsq value must not be significant for it should not have predictive powers except by chance. Table 2 shows that _hat and _hatsq value satisfy specification conditions and hence we had no specification issue.

Table 2: Model Specification of Moonlighting Model

Moonlighting	**Coef.**	**Std. Err.**	**Z**	**P>z**
_hat	0.955	.0914	10.45	0.000
_hatsq	-0.042	.0311	-1.36	0.175
_constant	0.124	.1976	0.63	0.529

Source: Survey

Similarly, Table 3 shows that Hosmer-Lemeshow test for goodness of fit was statistically insignificant which also showed that there is no goodness of fit issue. We had a good model fit.

Table 3: Logistic Model for Moonlighting, Goodness-of-fit Test

Number of observations = 630	Number of groups = 10
Hosmer-Lemeshow chi2(8) = 7.46	Prob> chi2 = .4882

Source: Survey

8. Conclusions and Policy Recommendations

This study concludes that moonlighting is practiced in the higher educational institutes of KP. The incident is 21% in regular university year while 27% faculty had additional (mostly administrative) charge within the university. The conclusions were drawn from the research that moonlighting is predicted by moonlighting wage rate and old age increases moonlighting wage. Moonlighting is positive in relation to wage of second job and negative to primary job wage. Urban location determines moonlighting. Non-regular employees moonlight. Hours of work at secondary job are a strong predictor of moonlighting. The effect of education is insignificant. Assistant professor tends to decrease moonlighting. The study recommends that moonlighting may be given due encouragement as it may enhance household income. It may also fulfill other pecuniary needs of the moonlighters. The study also recommends that such studies may also be undertaken in other sectors of the economy.

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