

MOONLIGHTING IN THE LABOR MARKET: EVIDENCE FROM THE UNITED KINGDOM

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Abstract

This study has three main objectives. First, it attempts to investigate the labor supply at the extensive margin for a second job, which is represented by the worker's decision to hold a second job. Second, the paper aimed to analyze second-job labor supply at the intensive margin, which is approximated by the hours spent in the second job. Third, the research aimed to investigate workers who have been self-employed in the second job while controlling for sample selection. The paper used the variable moon, representing all employed individuals aged between 18 and 65 who hold two jobs, as the dependent variable. Additionally, the independent variables used include individual demographic characteristics and work-related characteristics of the primary job. Quantitative research was employed, and data sources were drawn from the British Household Panel Survey (BHPS) from 1990 to 2008. The data were analyzed using STATA. The research findings confirmed the probability of having a second job at the extensive and intensive margins among the observed individuals. Furthermore, substantial evidence suggests the likelihood of individuals spending hours in a second job.

Keywords: Extensive margin, intensive margin, labor market, moonlighting, probability analysis.

Introduction

Moonlighting has emerged as a significant phenomenon in the contemporary labor market, driven by economic uncertainty, technological advancements, and evolving work patterns. This practice, characterized by individuals holding multiple jobs simultaneously, has attracted particular attention in sectors experiencing instability, such as information technology and healthcare. Higher education is associated with a greater likelihood of individuals engaging in moonlighting; however, those earning higher wages are less likely to engage in this behavior due to a dominant income effect that discourages additional job-holding (Auray et al., 2021). This phenomenon is reinforced by the rise of digital platforms that facilitate freelance work, enabling individuals to seek supplemental income while maintaining their primary jobs (Sharma & Rautela, 2024). The gig economy's flexibility contributes to this trend, offering opportunities that align with personal skills and interests (Shevchuk et al., 2022).

Furthermore, research indicates that non-economic factors play a substantial role in the decision to moonlight. Students, for example, may

choose to engage in moonlighting not only for financial benefits but also for the personal development opportunities it provides, as noted by Bozoğlu et al. (2024). This assertion is supported by the literature on work values in the gig economy, which shows that different motivations, such as career advancement and skill development, influence labor market participation (Shevchuk et al., 2022). Moreover, Samaan and Tursunbayeva highlight that the diversification of the labor force—spurred by digitalization and changing workplace environments—has led to increased acceptance and prevalence of moonlighting practices (Samaan & Tursunbayeva, 2024).

The implications of moonlighting extend to organizational dynamics as well. Sharma and Rautela highlight that while moonlighting can provide individuals with financial stability, it may also lead to challenges, including compromised work performance and reduced organizational commitment (Sharma & Rautela, 2024; Pouliakas & Conen, 2023). This aspect is particularly evident in the IT sector, where employers enact strict policies against moonlighting to address concerns about loyalty and performance, as illustrated by Wipro's decisive actions against employees found to be moonlighting (Shanmugavelu

et al., 2024). Similarly, research by Hara et al. suggests that engaging in side jobs could lead to psychological distress and turnover, complicating the relationship between multiple job holdings and career satisfaction (Hara et al., 2024).

According to these empirical studies, this research has thus helped fill the gap, particularly through the third hypothesis. It aims to elaborate on the complexities of moonlighting by examining its roots in economic necessity and its impacts on workplace dynamics. Therefore, the research has also analyzed the probability of demographic and work-related characteristics of the primary job that may significantly affect the likelihood that workers are self-employed in their second job. This study contributes to the literature by providing a more comprehensive empirical framework that simultaneously examines multiple dimensions of moonlighting behavior. In particular, the novelty of this research lies in its integrated analysis of labor supply decisions at both the extensive and intensive margins, while also incorporating the role of self-employment in secondary job activities.

Moonlighting

Moonlighting, defined as holding multiple jobs simultaneously, has become increasingly prevalent across various labor markets as economic conditions evolve. The increase in moonlighting can be attributed to various factors, including financial pressures, the rise of the gig economy, and shifting work values. These influences extend to new paradigms in employment that redefine how individuals engage in productive activities across different sectors.

The contemporary labor market presents a unique context for moonlighting, which is increasingly driven by the gig economy. As highlighted by Sharma and Rautela, the gig economy is characterized by temporary, flexible jobs, often mediated through online platforms, enabling individuals to take on additional work beyond their primary employment commitments (Sharma & Rautela, 2024). This structural transformation in the economy facilitates the integration of moonlighting into the professional landscape, allowing individuals to pursue multiple income-generating opportunities.

Furthermore, Bozoğlu et al. discuss how higher education students frequently engage in moonlighting for economic reasons, as well as personal and career development, suggesting that

moonlighting can serve as a strategic career move for many (Bozoğlu et al., 2024). This income and experience diversification is increasingly considered essential in an unpredictable labor market, emphasizing that moonlighting may enhance job security and employability.

Moonlighting at the Extensive Margin (Decision to Hold a Second Job)

On the economic front, the implications of moonlighting are significant. Samaraweera's work suggests that moonlighting can expand the labor force's capacity, thereby increasing productivity (Samaraweera, 2023). Traditional economic theories suggest that greater labor input is associated with higher production efficiency. However, this expansion in moonlighting must be contextualized within the broader economic landscape, where economic hardships compel individuals to seek additional income streams to manage financial insecurities. Moreover, Salau et al. argue that digital platforms have facilitated moonlighting, with many public servants in Nigeria resorting to digital marketing and freelancing as supplementary income sources, reflecting a broader trend where digitalization catalyzes moonlighting practices (Salau et al., 2024).

Nevertheless, while moonlighting offers certain financial advantages, it also presents challenges that must be addressed. As Pouliakas and Conen elucidate, moonlighting has complex implications for organizational commitment, potentially undermining an employee's loyalty and engagement with their primary employer (Pouliakas & Conen, 2023). The literature suggests that employees who moonlight often experience a conflict of interest between their primary job responsibilities and their additional obligations, which can lead to decreased performance and increased job strain. This aspect is corroborated by studies emphasizing the dual burden faced by individuals who balance multiple roles, indicating a possible detriment to mental and physical well-being due to overwork and divided attention (Rasdi et al., 2021).

H₁: Demographic characteristics and work-related characteristics of the primary job have significant impacts on the probability at the extensive margin (worker's decision to hold a second job).

Moonlighting at the Intensive Margin (Hours Spent in the Second Job)

Furthermore, the relationship between job satisfaction and moonlighting intentions has garnered considerable attention. Research has shown that individuals with lower job satisfaction are more inclined to moonlight to supplement their income and achieve a sense of fulfillment that their primary job does not provide (James, 2024; Pujianto & Pawenang, 2024). This insight suggests that organizations might effectively mitigate the urge to seek additional employment by improving employee job satisfaction. Such proactive measures align with the findings from researchers who advocate for enhanced workplace engagement as a pivotal factor in reducing moonlighting behaviors (Peng et al., 2021).

Furthermore, the implications of pandemic-induced economic conditions should not be overlooked. Many individuals turned to moonlighting during the COVID-19 crisis to offset financial losses sustained from lockdowns and economic uncertainties (Asravor, 2021). Studies show that the need for additional income during significant economic disruptions correlates with increased moonlighting activities, highlighting the role of external economic conditions in driving this phenomenon. As employees navigated precarious work situations, moonlighting provided a necessary buffer against financial instability (Rasdi et al., 2021).

H₂: Demographic characteristics and work-related characteristics of the primary job have significant impacts on the probability at the intensive margin (hours spent in the second job).

Moonlighting as Self-Employed in the Second Job

Moreover, the emerging trend of moonlighting has broader implications for societal structures, particularly regarding gender disparities. Research in Ghana suggests that men and women engage in moonlighting due to financial constraints and traditional gender roles (Asravor, 2021). These insights highlight how socio-demographic factors influence moonlighting behavior and how these dynamics can be addressed within policy frameworks aimed at promoting economic upliftment and equity.

The educational sector, particularly among faculty, has also seen a rise in moonlighting to

supplement inadequate salaries during economic strain. Sakyi and Agomor offer valuable insights into how educators engage in moonlighting, highlighting the need for income augmentation due to widespread wage dissatisfaction (Sakyi & Agomor, 2020). This phenomenon raises critical questions regarding the sustainability of faculty roles and the long-term impacts of dual employment on educational quality and commitment to primary institutional responsibilities.

While moonlighting offers opportunities for personal financial growth and skill development, it also poses significant challenges that merit careful examination. Organizations, educational institutions, and policymakers must navigate the complexities of moonlighting by understanding its roots in economic necessity, aligning employee engagement strategies, and addressing the impacts on workplace dynamics. Effective management of moonlighting contributes to employee well-being and, in the long term, enhances organizational productivity and commitment.

H₃: Demographic characteristics and work-related characteristics of the primary job have significant impacts on the probability of workers being self-employed in the second job.

Utilizing Probability Analysis on Moonlighting Estimation

Moonlighting, defined as holding multiple jobs simultaneously, has attracted increasing scholarly attention, particularly regarding its economic implications and analytical methodologies. A foundational aspect of research on moonlighting is the application of probabilistic models, such as logit and probit regression, to identify the factors influencing individuals' decisions to engage in moonlighting. Utilizing these statistical frameworks enables researchers to comprehensively examine the motivations and demographic variables that inform moonlighting behaviors.

Probit models, which assume normal error distributions, are particularly suited for binary outcome variables, such as the decision to moonlight or not (Omotayo et al., 2022). For example, Omotayo et al. employed a binary probit model in their research to investigate food security status among households in Nigeria, demonstrating the model's effectiveness in estimating categorical outcomes influenced by multiple factors (Omotayo et al., 2022).

Meanwhile, Hyder and Ahmed analyzed various influences on the likelihood of job holding using a bivariate probit model, finding that individual and contextual factors may not differ significantly by gender in their propensity to moonlight (Hyder & Ahmed, 2022). A critical exploration of moonlighting was offered by Asravor, who observed gender differences and motivations behind moonlighting behaviors in Ghana using logit regression, revealing that underlying economic pressures often motivate both men and women, albeit through slightly differing lenses (Asravor, 2021).

Moreover, Auray et al. found that the most productive workers are less likely to moonlight, an assertion supported by a dominant income effect that shapes labor supply decisions, which can significantly impact labor policy discussions, particularly concerning income inequality and job allocation strategies (Auray et al., 2021). This relationship between productivity and dual job-holding poses profound implications, as excessive moonlighting could detract from primary job commitments. This issue has been noted in medical training environments but lacks concrete data to support the assertion that even moderate moonlighting interferes with training (Field, 2023).

Research Methods

The research has been conducted in the United Kingdom. This type of research employs a quantitative approach using secondary data. Data sources were taken from the British Household Panel Survey (BHPS) from 1990 to 2008. The dataset remains relevant for this research, as the phenomenon in 2007, a crisis in one small part of the financial system, led to a worldwide economic conflagration by late 2008 and early 2009, known as the global financial crisis (Mishkin, 2011). During this time, extraordinary actions by central banks and governments have contained this global financial crisis, which has proved highly challenging and has led to excessive risk-taking. Therefore, this research has attempted to provide a plausible and robust assessment of economic conditions and their stability.

The data were analyzed using STATA (Cameron & Trivedi, 2010). The research employed logit and probit regressions to investigate factors influencing workers' decisions about having a second job at the extensive and intensive margins, as well as the probability of being self-employed in their second job.

Furthermore, the research has conducted a robustness check to assess the robustness of the estimation results. To do so, the paper utilized Heckman sample selection and the correction model to estimate the probability of workers being self-employed while controlling for sample selection bias.

Results and Discussion

Second Job Labor Supply Equation at the Extensive Margin (Decision to Hold a Second Job)

According to the data, the paper used the variable "moon," which represents all employed individuals aged 18 to 65 who hold two jobs, as the dependent variable. In addition, the independent or explanatory variables used are individual/demographic characteristics (gender, age, marital status, education, and region of residency) and work-related characteristics of the primary job (type of occupation, private sector, firm size, preference over working hours, pay-rise, promotion opportunity, and permanent contract).

Firstly, the research ran the estimation using a probit estimator without the `d` command. The results are presented in Model 1 (Probit). Secondly, the paper has rerun the analysis using a Probit estimator, including the `d` command (`dprobit`) given in Model 2 (`dProbit`), as shown in Table 1.

According to the results in Table 1, the paper finds that the variables 'more hours' and 'Scotland' are omitted in Model 1 due to a collinearity problem. Therefore, the paper reruns Model 2 without those two variables as explanatory variables, using the `dprobit` command. These results create marginal effects on each explanatory variable. Therefore, it would get the magnitude of the probability of the second job decision.

The results show that individual/demographic characteristics (age, education and region of residency except for Scotland) and work-related characteristics of the primary job (type of occupation, private sector, firm size, preference over working hours except for more hours, pay-rise, promotion and permanent contract) are statistically significant at the 5 percent level of significance. The results suggest that these explanatory variables are more likely to influence an individual's likelihood of holding a second job.

Table 1
A second job labor supply estimation at the extensive margin

Variables	Model 1 (Probit)	Model 2 (dProbit)
main		
male (d)	-0.0195 (0.0159)	-0.00289 (0.00234)
age	-0.00614*** (0.000672)	-0.000908*** (0.0000992)
couple (d)	-0.0279 (0.0161)	-0.00416 (0.00243)
degree (d)	0.174*** (0.0155)	0.0261*** (0.00235)
South (d)	0.225*** (0.0217)	0.0352*** (0.00358)
Midlands (d)	0.146*** (0.0244)	0.0231*** (0.00411)
North (d)	0.0491* (0.0238)	0.00741* (0.00366)
Wales (d)	-0.0131 (0.0286)	-0.00193 (0.00418)
Scotland	0 (.)	
Man Prof (d)	1.064** (0.374)	0.226* (0.104)
NManual (d)	1.126** (0.374)	0.258* (0.115)
R NManual (d)	1.137** (0.375)	0.237* (0.101)
HManual (d)	1.141** (0.375)	0.271* (0.120)
LManual (d)	1.217** (0.375)	0.302* (0.126)
private (d)	-0.276*** (0.0164)	-0.0439*** (0.00278)
firmsize	-0.0449*** (0.00312)	-0.00664*** (0.000459)
fewerhr (d)	-0.336*** (0.0265)	-0.0463*** (0.00340)
samehr (d)	-0.216*** (0.0244)	-0.0329*** (0.00382)
morehr	0 (.)	

Variables	Model 1 (Probit)	Model 2 (dProbit)
payrise (d)	-0.0581*** (0.0153)	-0.00858*** (0.00225)
promotion (d)	-0.120*** (0.0151)	-0.0178*** (0.00224)
permanent (d)	-0.165*** (0.0284)	-0.0270*** (0.00511)
N	68962	68962
pseudo R2	0,034	0,034

Marginal effects; Standard errors in parentheses

Data Source: the British Household Panel Survey (BHPS) 1990-2008

(d) for discrete change of dummy variable from 0 to 1

* p < 0.05, ** p < 0.01, *** p < 0.001

There are some interesting findings. Firstly, several variables decrease the probability of an individual having a second job, namely age, private sector, firm size, preference for working hours, pay rise, promotion, and permanent contract. It is confirmed that age has a significant negative effect on second-job labor supply, with younger workers more likely to hold a second job. It implies that increasing individual age by 1 year decreases the probability of having a second job by 0.09 percent, as one plausible argument suggests, due to financial necessity, such as the repayment of student loans or other debt (Dickey et al., 2011). Another possibility is that they are more likely to have higher incomes, allowing them to increase their savings and future assets.

Additionally, the private sector has a significant negative impact on the decision to hold a second job. It shows that if an individual's first job is in the private sector, the probability of having a second job decreases by 4.39 percent. The intuition is that individuals with primary jobs in the private sector might have a better working environment than those in the public sector. For instance, the private sector offers more incentives and rewards to workers who have performed well or are meeting their targets. Furthermore, they may also have better working benefits, such as health insurance, pension funds, or housing subsidies.

It also shows that firm size has a significantly negative impact on the decision to hold a second job. Suppose the average number of employees in the first job goes up by an infinitesimal amount. In that case, it decreases the probability of having

a second job by 0.66 percent. One plausible explanation is that individuals are more motivated to improve their work performance in high-competition workplaces. This would occur in association with the private sector results, which are statistically significant. Therefore, they are preferred not to hold a second job.

Meanwhile, the preference for working hours also indicates an adverse effect on taking a second job. The result shows that if the average preference for fewer working hours changes by one unit, it decreases the probability of taking a second job by 4.63 percent. If the working hours remain the same, the probability will decrease by 3.29 percent. These findings are consistent with previous research suggesting that individuals lack sufficient incentives to hold a second job.

Lastly, the pay raise, promotion, and permanent contract also make it harder to take a second job. The plausible explanation for these findings is consistent with the previous variables. Workers with better working environments are less likely to take a second job. If there is a one-unit increase in wage, it decreases the probability of taking a second job by 0.86 percent. If the average promotion policy increases by 1 unit, it will reduce the probability by 1.78 percent.

Moreover, an individual who works under a permanent contract is less likely to take a second job than a worker under a non-permanent contract. The primary reason is that workers with non-permanent agreements have a higher risk of unemployment compared to those with permanent contracts. Therefore, workers under non-permanent agreements are more likely to have a second job. Workers being permanently decreased the probability of having a second job by 2.7 percent.

The second interesting finding is that variables indicating a significantly positive effect on the probability of moonlighting include individuals who hold two jobs (Hamel, 1967). There are levels of education, types of occupations, and regions of residency except Wales. Individuals with a high level of education are more willing and likely to take a second job. It might be motivated by job heterogeneity (Wilkinson et al., 2014; Wu et al., 2009). It means that individuals may be dissatisfied with their current job description in terms of type and occupational experience (Schneider, 2011; Zangelidis, 2008), or it may not be well matched to their job preferences and qualifications. Therefore, there is an increased probability of moonlighting.

Overall, the findings of a second job labor supply estimation at the extensive margin confirm a priori expectations, that have been discussed previously. The research would expect to have a significant positive effect on the probability of taking a second job of being highly educated workers and in terms of any types of occupations regarding job heterogeneity motivation or a job that is different from their current primary employment (Boeri & van Ours, 2013; Borjas, 2013; Cahuc et al., 2014; Panos et al., 2014; Praptiningsih, 2022; Theodossiou, 2002).

Meanwhile, the research also predicts significant adverse effects on the likelihood of taking a second job in the private sector, as well as increases in underpayment and declines in promotion and permanent contract agreements. However, age is an interesting finding, and the paper does not expect as much from it as it does from other variables. The research assumed that the younger generation is most likely to have broader opportunities to explore their lives by pursuing higher education, being active in many organizations to develop their capacity, or expanding their social life during their golden age. Instead, they are more likely to have a second job after age 18. Nevertheless, the research outcome has suggested a positive perspective regarding these findings. It would strengthen the individual's capability to achieve a better quality of life.

Second Job Labor Supply Equation at the Intensive Margin (Hours Spent in the Second Job)

In this section, the paper estimates the intensive margin and the total hours spent in the second job, using the moon hours variable as the dependent variable. In terms of explanatory variables, the paper uses a set similar to the one in the previous section. The paper applies a Tobit estimator, including the marginal effects results, to the estimation procedure. Table 2 provides detailed results.

Table 2 shows the estimated hours spent on the second job. The evidence suggests that age, level of education, living in the South and Midlands, type of occupation, private sector, firm size, preference for working hours, pay rise, promotion, and preference for a permanent contract do not reject the null hypothesis that the difference is equal to zero. These findings are statistically significant in affecting the hours spent in the second job (i.e., the intensive margin).

Table 2
A second job labor supply estimation at the intensive margin

Variables	Model 3 (Tobit)
model	
male	-0.684 (0.847)
age	-0.326*** (0.0361)
couple	-1.241 (0.863)
degree	8.256*** (0.834)
South	10.17*** (1.161)
Midlands	6.574*** (1.304)
North	1.702 (1.269)
Wales	-0.799 (1.522)
Man Prof	57.91** (20.68)
NManual	61.42** (20.68)
R NManual	62.79** (20.68)
HManual	62.91** (20.69)
LManual	67.63** (20.69)
private	-14.49*** (0.888)
firmsize	-2.373*** (0.168)
fewerhr	-17.69*** (1.419)
samehr	-11.35*** (1.298)
payrise	-2.948** (0.818)
promotion	-6.612*** (0.809)
permanent	-8.607*** (1.508)

Variables	Model 3 (Tobit)
N	68962
pseudo R2	0,014

Marginal effects; Standard errors in parentheses

Data Source: the British Household Panel Survey (BHPS) 1990-2008

(d) for discrete change of dummy variable from 0 to 1

* p < 0.05, ** p < 0.01, *** p < 0.001

However, the magnitude and the direction of change in the probability of hours spent in the second job cannot be inferred from the coefficients, as they do not provide the marginal impact on the mean of the observed variables. Instead, the paper calculates the marginal effects of all explanatory variables on hours spent in the second job under three conditions to gauge the magnitude of each variable. Firstly, only those who currently have two jobs (Model 4). Secondly, for all the observations (Model 5) and the probability of being censored (Model 6). The detailed results are provided in Table 3.

According to Table 3, the paper divides the findings into two sections. The first section has a significantly positive effect, and the second has a significantly adverse impact on the hours spent in the second job. Firstly, education level has a statistically significant positive impact on the probability of hours spent in a second job. An additional year of education increases the hours spent in the second job by 0.67 hours (for the average individual, based on Model 5). Workers in the South and Midlands also have a statistically significant impact on the hours spent on a second job. On average, living in the South increases hours spent by 0.86, and living in the Midlands by 0.56. These results are also consistent with Models 4 and 6, but in different magnitudes.

Secondly, there are some interesting findings. It has been confirmed that age is statistically significant in affecting individuals on the intensive margin. On average, an additional year of age results in a decrease of 0.03 hours in the hours spent on the second job. This finding is also associated with Model 4 and Model 6, which have different magnitudes.

The plausible intuition is that as workers age, they tend to reduce the hours they spend on their second job, regardless of their physical condition or health problems. The incentives to work more are more likely to be less than the incentives to work less. The trade-off between work and leisure

Table 3
The corresponding marginal effects of all explanatory variables on hours spent in the second job

Variables	Model 4	Model 5	Model 6
model			
male (d)	-0.108 (0.133)	-0.0546 (0.0676)	-0.00185 (0.00230)
age	- 0.0513** * (0.00567)	- 0.0260*** (0.00287)	- 0.000882** * (0.0000972)
couple (d)	-0.196 (0.137)	-0.0999 (0.0702)	-0.00339 (0.00237)
degree (d)	1.307*** (0.132)	0.670*** (0.0687)	0.0226*** (0.00230)
South (d)	1.633*** (0.190)	0.864*** (0.105)	0.0289*** (0.00342)
Midlands (d)	1.059*** (0.214)	0.564*** (0.120)	0.0188*** (0.00392)
North (d)	0.270 (0.202)	0.138 (0.105)	0.00467 (0.00352)
Wales (d)	-0.125 (0.238)	-0.0630 (0.119)	-0.00215 (0.00406)
Man Prof (d)	10.88* (4.647)	8.106 (4.541)	0.225* (0.105)
NManual (d)	12.09* (5.068)	9.699 (5.418)	0.258* (0.116)
R NManual (d)	11.71* (4.598)	8.669 (4.475)	0.240* (0.102)
HManual (d)	12.69* (5.311)	10.57 (5.921)	0.274* (0.122)
LManual (d)	14.13* (5.669)	12.39 (6.674)	0.309* (0.128)
private (d)	-2.348*** (0.147)	-1.271*** (0.0846)	-0.0420*** (0.00270)
firmsize	-0.374*** (0.0263)	-0.189*** (0.0133)	-0.00643*** (0.000449)
fewerhr (d)	-2.712*** (0.211)	-1.296*** (0.00962)	-0.0447*** (0.00333)
samehr (d)	-1.808*** (0.209)	-0.941*** (0.112)	-0.0316*** (0.00370)
payrise (d)	-0.464*** (0.129)	-0.235*** (0.0649)	-0.00797*** (0.00221)
promotion (d)	-1.043*** (0.128)	-0.529*** (0.0650)	-0.0180*** (0.00219)

Variables	Model 4	Model 5	Model 6
permanent (d)	-1.412*** (0.257)	-0.783*** (0.155)	-0.0257*** (0.00493)
N	68962	68962	68962
pseudo R2	0,014	0,014	0,014

Marginal effects; Standard errors in parentheses

Data Source: the British Household Panel Survey (BHPS) 1990–2008

(d) for discrete change of dummy variable from 0 to 1

* p < 0.05, ** p < 0.01, *** p < 0.001

becomes a significant consideration for older workers. Regarding the private sector, the evidence shows a statistically significant effect on the number of hours spent. On average, an individual working in the private sector reduces the hours spent in a second job by 1.27 hours.

This result is similar to the firm size effect, which tends to decrease hours spent. If firm size changes, workers will reduce their hours by 0.19 hours. Adverse effects on pay rise, promotion, and permanent contract agreements also occurred. Individuals who work under permanent contracts tend to reduce the hours they spend on their second job by 0.78 hours compared to those who work under non-permanent contracts. In other words, individuals with non-permanent agreements are at risk of unemployment. Therefore, they are strongly motivated to increase their hours spent in the second job relatively more than individuals under permanent contracts. Overall, the findings on estimating the second job of labor supply at the intensive margin align with those for the extensive margin.

Being Self-Employed in the Second Job, while Controlling for Sample Selection

For the estimation procedure, the paper uses the Heckman sample selection model. Since the outcome variable is binary, the paper applies the Heck probit command. The paper also uses these four variables as exclusion restrictions in the Heckman correction model. There are: (1) firm size, (2) pay rise, (3) promotion opportunities, and (4) permanent contract in the primary job.

Wooldridge (2010) defines the properties of the selection bias in the model that occur when there is a violation of the following assumptions: (1) (x,y2) are constantly observed, but y1 is only observed when y2 = 1 (sample selection); (2) The variables are exogenous in the population, which

Table 4
The estimation of self-employed in the second job
using the Heckman sample selection model

Variables	Model 7
moon_self	
male	0.511*** (0.0379)
age	0.00391* (0.00175)
couple	0.115** (0.0392)
degree	0.0720 (0.0431)
South	0.348*** (0.0623)
Midlands	0.185** (0.0643)
North	0.132* (0.0614)
Wales	0.0685 (0.0741)
Man Prof	0.264*** (0.0639)
NManual	0.221*** (0.0622)
R NManual	0.0833 (0.0562)
HManual	0.253*** (0.0666)
private	0.122*** (0.0448)
fewerhr	0.282*** (0.0748)
samehr	0.139* (0.0618)
moon	
male	-0.0227 (0.0159)
age	-0.00603*** (0.000674)
couple	-0.0268 (0.0162)

Variables	Model 7
degree	0.172*** (0.0155)
South	0.220*** (0.0217)
Midlands	0.144*** (0.0245)
North	0.0479* (0.0239)
Wales	-0.0172 (0.0287)
Man Prof	-0.141*** (0.0250)
NManual	-0.0788** (0.0256)
R NManual	-0.0728** (0.0230)
HManual	-0.0671* (0.0266)
private	-0.271*** (0.0164)
fewerhr	-0.338*** (0.0266)
samehr	-0.219*** (0.0244)
firmsize	-0.0452*** (0.00312)
payrise	-0.0568*** (0.0154)
promotion	-0.119*** (0.0152)
permanent	-0.165*** (0.0284)
N	68908
pseudo R2	

Marginal effects; Standard errors in parentheses
 Data Source: the British Household Panel Survey (BHPS) 1990-2008

(d) for discrete change of dummy variable from 0 to 1

* p < 0.05, ** p < 0.01, *** p < 0.001

is (u1;v2) is independent of x with zero mean; (3) The error term is identically and independently distributed (distributional assumption), and (4) The error term or residuals may be correlated, e.g. bivariate normality.

The null hypothesis states that there is no selection bias problem in the model. Additionally, we expect no evidence of selection bias, as indicated by the failure to reject the null hypothesis. Therefore, Heckman (1979) introduces exclusion restrictions in the Heckman correction model to examine whether selection bias is present. We expect the exclusion restrictions to have insignificant results. Table 4 describes the estimation of self-employed in the second job using the heck probit command (Model 7).

Table 5 describes the estimation of self-employed with exclusion restrictions using a Probit estimator (Model 8).

Table 5
The estimation of self-employed with exclusion restrictions using a Probit estimator

Variables	Model 8
firmsize	0.0437 (0.00282)
payrise (d)	-0.0442*** (0.0134)
promotion (d)	0.0352** (0.0136)
permanent (d)	0.0429 (0.0229)
N	5890
pseudo R2	0,003

Marginal effects; Standard errors in parentheses

Data Source: the British Household Panel Survey (BHPS) 1990-2008

(d) for discrete change of dummy variable from 0 to 1

* p < 0.05, ** p < 0.01, *** p < 0.001

According to Table 5, the evidence rejects the null hypothesis that there is a selection bias problem through pay rises and promotions. Meanwhile, the other findings indicate that we failed to reject the null hypothesis regarding firm size and permanent contracts. This evidence is statistically insignificant. Recall that the research expects these variables' properties as exclusion restrictions in the Heckman correction model to be negligible (Heckman, 1979). Therefore, the paper defines only two variables that are satisfied. Additionally, the paper must confirm these results by manually comparing them with the Heckman correction model.

Robustness Check

The purpose of conducting a robustness check is to obtain strong evidence that all

exclusion restrictions are statistically insignificant. To do so, the paper follows these steps: (1) estimate the probability of having a second job using a Probit estimator; (2) construct the inverse Mills ratio; and (3) include this inverse Mills ratio as an additional regressor in the original self-employed equation model. This method is Heckman's correction model. The result failed to reject the null hypothesis of no selection bias. It is confirmed that lambda is statistically insignificant. This suggests that our exclusion restrictions (firm size, pay rise, promotion, and permanent contract) in the model provide evidence against a selection bias problem. Table 6 below gives the result of lambda.

Table 6
The exclusion restrictions testing on self-employed manually

Variables	Model 9
lambda	-0.0330 (0.0506)
N	5890
pseudo R2	

Marginal effects; Standard errors in parentheses

Data Source: the British Household Panel Survey (BHPS) 1990-2008

* p < 0.05, ** p < 0.01, *** p < 0.001

Conclusions and Implications

Various factors, including economic pressures, individual work values, and organizational contexts, influence the rise of moonlighting in the labor market. While it provides additional income and skill development opportunities, it also poses risks to employee well-being and organizational cohesion. Understanding the comprehensive dynamics of moonlighting is essential for employees and employers as they navigate the complexities of modern work environments. Moonlighting is shaped by multifaceted influences, ranging from economic pressures to evolving workplace dynamics, which engender diverse responses across different sectors. The ongoing discussion of moonlighting in the labor market reflects broader shifts in employment patterns and demands a nuanced understanding of its implications for individuals and organizations.

Overall, operationalizing moonlighting in the academic field involves complex motivations, economic realities, and statistical methodologies. The growing literature uses logit and probit

models to illuminate the nuanced framework of dual job-holding decisions across cultures and economic conditions. As research in this domain matures, integrating multifaceted data analysis will enhance our understanding of moonlighting and its implications on labor economics and public policy. Future studies could benefit from longitudinal data to track changes in behavior over time, providing further insight into the adaptability of moonlighting patterns to economic shifts and technological advancements.

In summary, the ongoing dialogue surrounding moonlighting fundamentally addresses socioeconomic dynamics, individual motivations, and the accuracy of statistical modeling. The complex interplay of these factors warrants a continuous research approach that captures the evolving nature of work and financial behavior in contemporary societies, leading to informed policymaking and deeper theoretical insights into labor economics and behavioral studies.

The Heckman sample selection model concludes that the estimation model is robust and credible. Overall, the findings of a second job labor supply estimation at the extensive margin confirm a priori expectations, that have been discussed previously. There are significant positive effects on the probability of taking a second job, particularly among highly educated workers, as well as on job heterogeneity motivation across all occupational types. Meanwhile, there are also significant adverse effects on the probability of taking a second job in the private sector, including being underpaid, not receiving pay raises, and not being offered permanent contracts.

Finally, the research concludes that there is a probability of having a second job at both the extensive and intensive margins among the observed individuals. However, some variables increase the probability of having a second job, while others decrease the likelihood. Furthermore, substantial evidence suggests that individuals are likely to spend hours in a second job. In conclusion, the overall findings confirm a priori expectations based on the best available literature review and empirical research.

Nevertheless, the research has several limitations, as follows: First, the data were quite limited during the study period, particularly in terms of constraints. It is better to use updated data, such as data collected before the COVID-19 pandemic or in the post-pandemic era. This study period would be beneficial for further research

because the COVID-19 pandemic has significantly worsened the economy. Therefore, one of the critical findings, particularly regarding the effect of age on having a second job, is likely to be worth exploring further in future research. Second, the research focuses on only one country as a case study. Since moonlighting is widespread in many developed and developing countries, it would be highly beneficial to investigate how it is implemented across countries. Lastly, moonlighting has been linked to government laws and regulations, particularly in the labor market, such as minimum wage policies and their determinations. Therefore, it would be interesting to analyze the government's effectiveness in improving labor income distribution and well-being in further research.

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