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Factors Influencing Secondary Employment in Germany: An Overview

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Abstract
In Germany, a significant number of individuals choose to take on additional jobs alongside their primary employment. The decision to seek a second job is influenced by various factors, including personal needs such as the desire to enhance one's material status, family circumstances, and the opportunities linked to human capital. This study investigates these motivations while also considering demographic factors like age, gender, and place of residence, as well as characteristics of the primary workplace. However, not all determinants of holding a second job are easily observable, as some influences remain unmeasured or generally unobservable. To address these complexities, this study employed models that account for unobservable heterogeneity, which are particularly relevant for analyzing such multifaceted phenomena. The primary aim of this paper was to outline the demographic profile of individuals who engage in dual employment by assessing the impact of selected factors on the likelihood of having a second job. The study further explores the varying influence of these determinants between men and women, offering a comparative analysis of the gender-specific factors driving the decision to take on additional work. To achieve these objectives, the research utilized a Bayesian logistic regression model, which allowed for a nuanced understanding of the predictors of secondary employment. The findings provide a detailed demographic profile of two-job workers in Germany, highlighting the distinct factors that influence men and women differently in their decision to pursue additional employment. This analysis contributes to a broader understanding of the labor market dynamics in Germany, offering insights into the socio-economic and demographic factors that compel individuals to seek multiple sources of income. The results have implications for policymakers and labor market analysts interested in addressing the needs and challenges faced by dual jobholders in a modern economy.
Keywords: Dual Employment, Secondary Job, Labor Market, Germany, Gender Differences
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1. INTRODUCTION

The labor market in Germany has seen significant improvements in recent years. According to Eurostat, the unemployment rate decreased from 10.3% in 2013 to 6.2% in 2016 (Eurostat, 2017). This favorable development may increase the likelihood of unemployed individuals finding work, as well as providing more opportunities for those already employed but seeking additional employment. The question then arises: What factors lead some people to take on a second job in addition to their primary employment? Are these individuals driven by high professional ambitions, or are they motivated by financial difficulties that necessitate additional work? The aim of this study was to explore the demographic characteristics of individuals holding multiple jobs. Specifically, the research sought to identify and assess the impact of various factors on the likelihood that salaried employees would engage in multiple jobholding. The study found that the level of professional activity is influenced by age. According to data from the Central Statistical Office (CSO, 2015), the unemployment rate begins to rise after the age of 44. Consequently, the study focused on individuals between the ages of 18 and 44, excluding those under 18 due to the high proportion of young people still studying in that age group.

This demographic focus is important for understanding the motivations behind multiple jobholding. By limiting the analysis to those aged 18-44, the study aims to provide clearer insights into how factors such as financial necessity, professional ambition, and other socio-economic variables influence the decision to take on additional employment. Through this examination, the research sheds light on the broader dynamics of the labor market in Germany and the individual circumstances that drive multiple jobholding among salaried employees. Having an additional job, much like having a primary job, is influenced by a variety of socio-demographic and economic factors. In labor market research, characteristics such as age, education, place of residence, and region have frequently been examined in relation to employment status (Socha and Sztanderska, 2000; Landmesser, 2013; Ulman, 2015). It can be reasonably assumed that the effects of some of these factors, such as age, education, or gender, on the likelihood of holding an additional job will follow similar patterns to those seen in studies of primary employment. However, the scale of this influence may differ. For example, while age or education level may predict the likelihood of holding any job, their influence on taking up an additional job may be more nuanced, reflecting factors such as financial necessity, career ambition, or work-life balance considerations. Gender may also play a different role, with societal expectations or family responsibilities potentially influencing the decision to take on multiple

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jobs differently for men and women. In studying the determinants of additional jobholding, it is important to also consider factors related to the individual's primary workplace. Variables such as earnings or whether the primary job is part-time are critical, as those with lower incomes or part-time positions may be more likely to seek additional employment to supplement their income. Additionally, individuals' needs and preferences for professional self-development form a separate group of characteristics that can motivate multiple jobholding. For instance, individuals looking to advance their careers, gain new skills, or explore different fields may choose to take on extra work as a means of professional growth.

By considering both socio-demographic factors and workplace-related characteristics, this study aims to provide a comprehensive understanding of why some people take on additional jobs, offering insights into both financial and non-financial motivations behind multiple jobholding. The data on individuals who, in addition to their primary job, take on secondary paid work is detailed in the *International Social Survey Programme* (Czapiński and Jerzyński, 2016), which provides an overview of how frequently people from various socio-economic groups engage in multiple jobs. This study contributes to understanding the demographic profile of those who take on additional work by constructing a statistical model that examines the simultaneous influence of various socio-economic and demographic factors on the likelihood of holding an extra job. The advantage of this approach lies in its ability to capture a comprehensive view of multiple jobholding by factoring in the complex interactions between these determinants. A significant limitation, however, is the absence of a comprehensive database in Germany that captures all the relevant characteristics of individuals working multiple jobs. Without such a dataset, it becomes challenging to accurately analyze how various factors interact and influence the decision to take on additional employment. In many cases, certain determinants of multiple jobholding—such as individual financial stress, personal motivations, or unrecorded economic activity—are not easily observed or are generally unobservable in standard labor market data. This limitation complicates the analysis of how these unobserved factors might influence individuals' decisions to take on a second job, creating gaps in understanding the full range of influences behind multiple jobholding.

To address this, the analysis must account for the inherent heterogeneity within the population being studied. Every individual's decision to engage in multiple jobholding is influenced by a unique set of socio-economic, personal, and demographic characteristics. This heterogeneity may stem from observable variables such as age, education, and occupation, or from unobservable factors like personal financial goals, lifestyle preferences, or household financial conditions. As Caselli et al. (2005) emphasize, an appropriate methodological framework is needed to assess the impact of population heterogeneity on the results obtained from such studies. In this study, both fixed and random effects models were used to account for this heterogeneity. The use of fixed effects allows for the control of unobservable variables that are constant over time but differ across individuals, while random effects consider variables that vary across both individuals and time. By employing these two models, the analysis becomes more robust, capturing the complexity of factors influencing multiple jobholding decisions, particularly when some explanatory variables may be missing or difficult to observe (Allison, 2009b). Furthermore, a Bayesian approach was applied to the econometric modeling of this phenomenon (Gelman et al., 2000). The Bayesian methodology adds another layer of sophistication to the analysis, allowing the study to incorporate prior information and update it as more data becomes available. This approach enables researchers to compare posterior distributions, which reflect the probability of multiple jobholding, across different groups of employees, providing a more nuanced view of the factors influencing the likelihood of taking on additional work. The Bayesian framework is particularly useful for addressing uncertainties and incorporating unobservable factors, as it allows for the integration of both subjective and empirical insights into the modeling process. Through this approach, the study is able to refine its understanding of the socio-economic and demographic variables driving multiple jobholding. For instance, the Bayesian analysis can be used to assess how factors like income levels, job satisfaction in the primary job, or regional economic conditions might influence the probability of taking on a second job. It can also account for personal preferences, such as an individual's ambition for professional development or the desire to diversify income sources, which are often unmeasured in traditional datasets. This flexible modeling approach helps overcome the limitations posed by the lack of comprehensive data, providing deeper insights into the motivations and constraints that drive individuals to work multiple jobs.

Moreover, the use of the Bayesian framework allows for a dynamic interpretation of labor market behavior. As new data become available, the model can be updated to reflect changing economic conditions or shifts in personal and societal motivations for taking on multiple jobs. This adaptability is crucial in understanding labor markets, which are often subject to rapid changes due to economic crises, technological advancements, or policy shifts. For instance, the COVID-19 pandemic has drastically altered employment patterns worldwide, with many individuals seeking multiple jobs due to income insecurity, and a Bayesian approach would be useful in capturing these evolving trends. This study highlights the complex factors influencing multiple jobholding by salaried employees, particularly in the absence of comprehensive datasets. By utilizing fixed and random effects models alongside the Bayesian approach, the research is able to account for both observable and unobservable variables, offering a more comprehensive understanding of why individuals choose to take on additional work. This method not only allows for a richer interpretation of the data but also provides the flexibility needed to adapt to changing labor market conditions. Ultimately, the findings of this study underscore the need for better data collection and a more nuanced analysis of the multiple socio-economic and demographic factors that drive individuals to engage in multiple jobholding.

2. METHODOLOGY

In line with the research objective, our study focused on individuals aged 18-44 who were included in the Labor Force Survey (LFS). A total sample of 20,225 respondents was collected, out of which 1,187 individuals (5.87%) reported having an additional job. The sample was diverse not only in terms of multiple jobholding but also in other socio-demographic and economic characteristics. To model the probability of holding an additional job, a set of potential exogenous variables was selected based on previous research findings and theoretical considerations outlined in this study. Given the binary nature of the endogenous variable (whether or not a person has an additional job), logistic regression models were employed for the analysis. Logistic regression is well-suited for modeling binary outcomes and can incorporate both fixed and random effects (Allison, 2009a). In a logistic regression model with fixed effects, unobservable differences between individuals are treated as constants. The estimation of such models is carried out using standard methods for logistic regression. On the other hand, a logistic regression model with random effects accounts for unobservable heterogeneity by assuming that these differences follow a specific distribution (Collett, 2003).

At the first stage of the research, both fixed-effects and random-effects models were estimated for the entire sample. Due to the large sample size, all models were estimated with non-informative prior distributions, ensuring that no prior knowledge significantly influenced the results. Specifically, for all regression parameters, independent normal prior distributions with a mean of 0 and a variance of 10^6 were used. In the random-effects model, an additional parameter representing the variance of the random component was included. For this parameter, a non-informative inverse gamma prior distribution with shape and scale parameters set to 0.01 was applied. To further enhance the accuracy of the results and reduce the influence of initial values on posterior inferences, a burn-in phase of 10,000 iterations was applied, followed by 50,000 iterations for the estimation process. The Metropolis algorithm was used to sample from the posterior distributions, which is an effective approach for estimating complex models in Bayesian analysis. To compare the performance of the fixed-effects and random-effects models, the Deviance Information Criterion (DIC) was employed as the measure of model fit. The DIC statistic is a widely used criterion in Bayesian modeling, balancing model fit with complexity. For the random-effects model, the DIC value was 4108.259, while the fixed-effects model produced a DIC value of 4132.663. This comparison indicates that the random-effects model provides a better fit to the actual data, as evidenced by the lower DIC value. The finding that the random-effects model better matches the data suggests that unobserved heterogeneity plays a significant role in determining the likelihood of holding an additional job. This means that individual-specific characteristics, which are not directly measured, may influence the decision to take on a second job. By incorporating random effects, the model captures this unobservable variation more effectively than a fixed-effects model, leading to a more accurate representation of the factors influencing multiple jobholding.

The analysis demonstrates that the random-effects logistic regression model offers a better explanation of the factors influencing multiple jobholding among individuals aged 18-44. The use of non-informative priors and the Bayesian framework allows for a robust comparison between models, with the random-effects model proving to be more reflective of the complexities inherent in the data. This approach highlights the importance of accounting for unobservable heterogeneity when analyzing labor market behaviors such as holding multiple jobs. The significance of the parameters in the models was assessed using the highest probability density interval of the posterior density function, as described by Bolstad (2007). At a significance level of 0.05, two variables were found to be statistically insignificant: the second level of the *Net earnings in the main job* variable and the first level of the *Region of Germany* variable. This suggests that these particular variables did not have a statistically meaningful effect on the likelihood of holding an additional job in the population studied.

Additionally, the Monte Carlo standard errors (MCSE) for the parameters in both the fixed-effects and random-effects models were compared (Table 4). The MCSE values, which measure the precision of the estimates generated through the simulation process, were found to be slightly lower for the random-effects model. This indicates that the random-effects model produces slightly more stable estimates of the parameters. Before interpreting the results, the convergence of the generated Markov chains was assessed using the Geweke test, which evaluates whether the Markov chains used to generate posterior distributions have reached convergence. Table 4 shows that there was no reason to reject the hypothesis that the chains for individual parameters in both models had converged, with the results showing convergence at the 0.01 significance level. This suggests that the models generated reliable estimates for each of the parameters. Given that the Deviance Information Criterion (DIC) statistics indicated that the random-effects model provided a better fit to the empirical data, the results from this model were chosen for interpretation. All subsequent interpretations are based on this model and apply across the different sets of explanatory variables, assuming the ceteris paribus condition (all other factors held constant). This means that the interpretations focus on the marginal effects of each explanatory variable, taking into account that other variables remain unchanged.

The analysis confirmed that the random-effects model was better suited for explaining the factors influencing the probability of holding an additional job, based on the DIC statistics and the precision of the parameter estimates. The use of the Geweke test ensured that the posterior distributions were reliable and convergent, adding further confidence to the interpretations provided. This approach underscores the importance of selecting the most appropriate model to capture the underlying dynamics of multiple jobholding, particularly when dealing with unobserved heterogeneity in the population. The study reveals that several socio-demographic and economic factors significantly influence the likelihood of individuals holding an additional job. Age emerged as a critical factor, with individuals in their mid-20s to mid-40s showing a greater propensity

for multiple jobholding compared to younger workers. Those aged between 25 and 34 were more likely to have an additional job than those in the youngest age group, while individuals aged 35 to 44 were even more likely to take on extra work. This trend suggests that mid-career professionals are particularly inclined to pursue additional employment, possibly due to increased financial responsibilities or a desire to further their careers. Education also plays a notable role, as individuals with lower educational qualifications were less likely to hold multiple jobs. Those with post-secondary and secondary professional education were found to have fewer chances of having an additional job compared to university graduates. Similarly, individuals with secondary and vocational education had significantly lower chances of holding multiple jobs. These findings highlight that higher education may provide more opportunities for supplementary work, possibly because it opens up part-time consulting roles, freelance opportunities, or other professional engagements that complement full-time employment.

The presence of children in a household also influenced the likelihood of additional jobholding. People living in households with children under the age of 15 were more likely to seek extra employment compared to those without young dependents. This could be a reflection of the financial pressures associated with raising a family, driving individuals to pursue additional income. Geographical factors also shaped jobholding patterns, with individuals living in towns being less likely to engage in multiple jobs compared to those residing in villages. Furthermore, people from regions outside the Eastern part of the country were generally less likely to hold an additional job, with significant differences observed in the South-Western, Southern, North-Western, and Northern regions. These regional variations likely reflect differences in local economic conditions, labor market opportunities, and cultural attitudes toward work. Workplace characteristics further influenced multiple jobholding. Employees with indefinite contracts were more likely to have an additional job, as were those working in non-public institutions. This suggests that job security and the flexibility offered by certain employment arrangements may enable individuals to take on extra work. Conversely, higher earnings and full-time employment reduced the likelihood of holding an additional job. Workers earning higher salaries or employed full-time were less inclined to seek secondary employment, likely due to a combination of financial sufficiency and time constraints.

The study highlights that the decision to take on an additional job is influenced by a complex interplay of factors, including age, education, household structure, place of residence, region, and workplace characteristics. Those in their mid-career, with higher education, living in rural or economically weaker regions, and with flexible employment arrangements are more likely to engage in multiple jobholding. This provides valuable insights into the socio-economic dynamics driving individuals to seek additional employment, emphasizing the need for a nuanced understanding of labor market behavior. The study also highlights that gender played a significant role in determining the likelihood of holding an additional job. Men were found to have a substantially higher chance—about 87.48%—of taking on extra employment compared to women. This suggests that men may be more inclined or able to pursue additional work, possibly due to societal roles or labor market dynamics that offer them more opportunities for secondary employment.

To further explore how the factors influencing multiple jobholding differ between men and women, two separate models with random effects were estimated—one for women and one for men. These models aimed to identify whether the same variables had different impacts on each gender's likelihood of holding an additional job. The results, presented in Tables 5-7, show significant differences between men and women in terms of which factors were influential. For women, several factors did not have a statistically significant impact on their likelihood of taking an additional job. These included having a contract for an indefinite period, earning between PLN 1,400 and PLN 3,000, earning more than PLN 3,000, and being aged 25 to 34. This suggests that for women, these factors do not strongly affect their decision to take on additional work, indicating that other variables, possibly related to family responsibilities or work-life balance, might be more influential. In contrast, for men, only a few factors were found to be statistically insignificant. Specifically, earnings between PLN 1,400 and PLN 3,000, as well as residence in the Central region, did not significantly affect their chances of holding an additional job. This indicates that for men, factors like earnings and regional location may not play as critical a role as they do for women, potentially reflecting differences in labor market participation or the types of opportunities available to each gender. The Geweke test was applied to assess whether the Markov chains used in the estimation process had converged, ensuring the reliability of the model results. For both the male and female models, the test indicated that the Markov chains had converged at the 0.05 significance level, except for the "living in a town" factor in the model for men, where a p-value of 0.0367 was obtained. This suggests that while most factors were estimated reliably, caution should be taken when interpreting the results for the "living in a town" variable in the men's model. The analysis reveals that gender differences play a crucial role in determining the likelihood of multiple jobholding, with men being more likely than women to take on additional work. Furthermore, the factors influencing this decision vary between the sexes, with certain variables being statistically significant for men but not for women, and vice versa. These findings highlight the importance of considering gender-specific factors when analyzing labor market behaviors and motivations for taking on additional employment.

The analysis shows that most of the factors influencing the likelihood of taking on an additional job were similar for both men and women. However, notable differences emerged for certain variables, particularly those related to the nature of the main workplace and the place of residence. One significant difference was observed in the impact of working in non-public institutions. Women employed in non-public institutions had a 76.56% greater likelihood of holding an additional job compared to other women, while for men in non-public institutions, the odds were 55.83% higher. This suggests that non-public sector jobs may offer more flexibility or incentives for women to pursue supplementary employment, while men in such positions are also more likely to take on additional work, though to a slightly lesser extent. Place of residence was

another area where the gender differences were pronounced. Women living in cities were 45.52% less likely to have an additional job compared to those living in villages. For men, this difference was even larger, with city dwellers being 65.47% less likely to hold a second job than their counterparts in rural areas. This variation may reflect differences in the types of jobs available in urban versus rural settings, as well as the different work-life dynamics faced by men and women in these areas. Rural areas may offer fewer formal employment opportunities, potentially pushing individuals, especially men, to seek multiple jobs, whereas women in urban settings may face barriers such as childcare responsibilities or more rigid work schedules.

Age also played a role in shaping multiple jobholding patterns, particularly for men. Men aged 25 to 34 had an 80% higher chance of taking on an additional job compared to those in the youngest age group, and for men aged 35 to 44, the chances were even higher at 143.59%. In contrast, for women, the variable corresponding to the 25 to 34 age group was statistically insignificant, suggesting that this factor did not significantly influence their decision to take on additional work. For women aged 35 to 44, however, the increase in the likelihood of multiple jobholding was similar to that of men in the same age group, though slightly lower. This indicates that mid-career men are more likely to take on extra work, possibly due to financial obligations or career development goals, while for women, other factors may play a more important role. To further explore these gender differences, the resulting posterior distributions for selected factors were analyzed. Despite similar posterior means between men and women for certain factors, the distributions often varied in terms of dispersion. For example, the primary school education variable showed greater variation in behavior among women than men. This suggests that while the average effect of this factor might be similar, individual behavior within these groups can differ widely, with women showing more diversity in their approach to taking on additional jobs based on lower levels of education. While many determinants behind taking on an additional job were similar for both genders, significant differences were observed in the impact of the type of workplace, place of residence, and age. Women in non-public institutions were more likely to hold additional jobs than men, and rural living appeared to drive men more strongly towards multiple jobholding. Age-related factors also showed more variation for men, indicating that men in their mid-career years are more likely to pursue extra employment opportunities compared to women. The analysis of posterior distributions further highlights that within these broader trends, individual variability, particularly for women, plays an important role in understanding the dynamics of multiple jobholding across genders.

3. CONCLUSIONS

In this study, we examined the strength and direction of the impact of various exogenous factors on the likelihood of salaried employees holding an additional job. By focusing on these factors, we were able to construct a demographic profile of workers who are more likely to engage in multiple jobholding. In addition to identifying these key demographic and economic characteristics, we also considered the role of unobserved heterogeneity in the test sample and how it affected the estimation results. The comparison of parameter estimates between models with fixed effects and those with random effects showed that there were no significant differences in the values obtained. However, the random-effects model proved to be a better fit for the empirical data, as indicated by model fit criteria. Therefore, the results derived from the random-effects model were used for the interpretation of the findings. By using the random-effects model, we were able to account for both observed and unobserved factors influencing the decision to take on an additional job, providing a more accurate and comprehensive understanding of the determinants behind multiple jobholding. This approach helped to ensure that the findings reflected the underlying complexities of labor market behavior, particularly when considering variations in individual characteristics and circumstances that may not be directly observable. As a result, the demographic and economic profile of two-job workers, including factors such as age, gender, education, and place of residence, became clearer, offering valuable insights into the motivations behind additional employment in salaried workers. The analysis conducted in this study strongly suggests that economic factors are the primary drivers behind the decision to take on an additional job. This is particularly evident from the results related to income levels at the primary place of employment. Individuals with higher incomes were found to be less likely to take up an additional job compared to those with lower incomes, implying that the need for supplementary income diminishes as earnings from the primary job increase.

The regional analysis of Germany further supports this economic rationale. The study found that people living in the Eastern region, where wages tend to be lower compared to other parts of the country, were more likely to hold additional jobs. This highlights the role of regional wage disparities in shaping labor market behavior, with residents of lower-wage areas more likely to seek extra work to supplement their income. Moreover, the presence of a child under the age of 15 in the household was also associated with a higher likelihood of taking on an additional job. This finding suggests that the financial demands associated with raising children, such as education, childcare, and general household expenses, may push individuals to seek supplementary employment to meet these needs. Overall, the results of this study suggest that economic pressures, such as low income and the costs of raising a family, are key factors motivating individuals to take on additional jobs. This emphasizes the role of financial necessity in multiple jobholding, particularly in regions and households where income may not be sufficient to cover all expenses. According to Eurostat, the employment rate for young people aged 15 to 24 in Germany from 1997 to 2015 was around 30% (Eurostat, 2017). Our study aligns with this, indicating that individuals in this age group had the lowest likelihood of holding an additional job. This is likely due to many young people focusing on education or having limited experience and job opportunities, which reduces their ability or need to take on multiple jobs.

Further analysis, supported by findings from other studies (CSO, 2015; Grzenda, 2017), shows that individuals with higher education have the greatest likelihood of securing a job. This group also exhibited the highest chances of taking on an additional job compared to those with lower levels of education. The higher probability of multiple jobholding among well-educated individuals may be linked to the diverse opportunities available to them, such as consulting or freelance work that can be pursued alongside full-time employment. From a gender perspective, the study highlights a significant disparity: men were much more likely to take on an additional job than women. This suggests that when household income is insufficient, men are more likely to seek supplementary employment. The finding reflects the persistence of traditional gender roles in Germany, where men are still often seen as the primary earners, responsible for providing financial support, while women are more focused on managing the home. This cultural norm could explain why men, rather than women, tend to take on extra work when additional income is needed. Moreover, the study found that individuals living in rural areas were more likely to engage in additional employment than those living in cities. This may be because rural areas often offer seasonal or occasional work, such as in agriculture or other labor-intensive sectors, providing more accessible opportunities for people to take on secondary jobs. In contrast, urban areas may have more structured labor markets, where opportunities for flexible or supplementary employment may be less readily available. In conclusion, the findings from this study point to key demographic, educational, and gender-based factors influencing multiple jobholding in Germany. Younger individuals and those with lower education levels are less likely to take on additional jobs, while men and those with higher education or living in rural areas are more likely to do so. These results reflect the intersection of economic necessity, traditional family roles, and regional employment patterns in shaping the labor market behavior in Germany. In summary, this research demonstrates that additional employment is most commonly taken up by individuals over the age of 25, those with low income, those with a child under 15, and by well-educated people. Men were also more likely to hold an additional job than women, all under the ceteris paribus condition. Conversely, individuals with a sufficient income and those in full-time employment were found to be less inclined to seek additional work. This tendency can be interpreted in two ways. On the one hand, individuals with stable income and full-time jobs may prioritize achieving a balance between work and family life, avoiding the need for additional employment. On the other hand, their primary jobs may be so demanding or time-consuming that holding another job simultaneously becomes impractical or undesirable. These findings suggest that both financial necessity and personal or professional commitments play key roles in shaping decisions about taking on additional employment.

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