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Socio-Economic Determinants of Unemployment in Rural Haryana, India

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Abstract:

Purpose: *This study investigates the structural dynamics of unemployment in rural Haryana by examining the influence of key socio-economic determinants using a binary logistic regression model.*
Design/Methodology/Approach: *Drawing on primary data, the analysis explores how gender, age, marital status, educational attainment, economic status, family composition, occupation type, and household income shape individuals' employment probabilities.*
Findings: *The findings reveal that unemployment in rural Haryana is neither homogenous nor transitory, but rather deeply embedded within intersecting socio-economic inequalities and uneven access to labour market opportunities. Among the examined variables, gender, education level, and vocational training emerge as the most significant predictors of employment status. The pronounced gender gap reflects substantial barriers faced by rural women, underscoring the urgent need for gender-sensitive employment policies, skill enhancement programs, and institutional support mechanisms. Furthermore, the positive correlation between higher education and employment outcomes affirms the critical role of investing in rural education, digital literacy, and demand-driven skill development. The analysis also highlights that individuals from lower-income households and those engaged in casual non-agricultural work face heightened unemployment risks, indicating the structural vulnerability of informal rural employment. In contrast, regular salaried jobs and agricultural labour offer greater employment security.*
Practical Implications: *Based on these insights, the study advocates for a multi-pronged policy approach that prioritizes formalization of rural employment, expansion of vocational training, and inclusive economic strategies tailored to the needs of disadvantaged populations. Such interventions are essential for fostering sustainable livelihoods and reducing unemployment in rural Haryana.*
Originality/Value:

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1. Introduction

Unemployment, a global scourge, casts a long shadow over individuals, economies, and societies (Berger and Schindler, 2014). Its detrimental effects ripple through various facets of life, leaving a trail of financial hardship, social unrest, and psychological distress. From a personal standpoint, unemployment can lead to reduced income, debt accumulation, and a decline in self-esteem (Linn *et al.,* 1985; Bacikova-Sleskova *et al.,* 2007).

Economically, it dampens consumer spending, slows growth, and exacerbates income inequality. Socially, unemployment can contribute to increased crime rates, social unrest, and a decline in overall well-being (Eichhorst *et al.,* 2013; O'Higgins, 2017). Global unemployment rates, despite recent improvements, continue to pose a significant challenge to economies worldwide.

The International Labour Organization's (ILO) highlights the fragility of the labour market recovery, predicting a slight increase in unemployment rates in 2024 (Horne, 2024). While the overall global unemployment rate has declined, disparities persist between high-income and low-income countries, with the latter facing more substantial challenges in finding suitable employment. Factors such as economic downturns, technological advancements, globalization, and demographic shifts play a crucial role in driving unemployment rates in current scenario (Srivastava *et al.,* 2024; Grecu *et al.,* 2024).

India has emerged as a global economic powerhouse, with projections indicating it will become the world's third-largest economy by 2027 (Ernst and Young, 2023). Despite its impressive economic growth, India faces a persistent unemployment crisis. The country's labour market struggles to keep pace with the expanding economy, plagued by challenges such as the slow pace of structural transformation, the prevalence of informal work, and regional disparities in employment outcomes.

The unemployment rate has risen significantly, according to the National Sample Survey, the unemployment rate for those aged 15+ increased from just over 2% in 2000 and 5.8% in 2019, before declining to 4.1% in 2022 (Kapoor, 2020; *Basole et al.,* 2021; Jha and Kumar, 2022, Periodic Labour Force Survey report (PLFS), 2023). To address this complex issue, India needs a multi-pronged approach to adopt policies that prioritize labour-intensive industries, support small businesses, invest in green and blue economies, invest in emerging sectors, promote inclusive urbanization, and strengthen labour regulations, which significantly improve job quality (Institute for Competitiveness, 2023).

Haryana, renowned for its significant contributions to India's agricultural and industrial sectors, displays a complex socio-economic landscape. Despite notable economic growth, this progress has been uneven, resulting in disparities in employment opportunities (Government of Haryana, 2024). The state has seen a

troubling rise in unemployment, increasing from 0.8 percent in 1993-94 to 5.8% in 2022-23, with a peak of 9.5% in 2017-18, according to NSSO data (Research Bank of India (RBI, 2023). This trend poses significant challenges to Haryana's growth trajectory and underscores the urgent need to understand the factors driving unemployment in rural Haryana.

Previous existing research Studies in different regions of the world measure the complex relationship of unemployment level with various economic, social, and institutional factors (Bruno *et al.,* 2014). Economic variables such as GDP growth, inflation, Government expenditure and foreign direct investment have been linked to unemployment level (Hutengs and Stadtmann, 2014).

Social factors, including demographics, education, and family background, have been identified as influential determinants (Kelly *et al.,* 2014; O'Reilly *et al.,* 2015; Eichhorst *et al.,* 2013). Institutional factors like labour market policies and regulations have also been examined (Quintini and Martin, 2006).

While these studies offer valuable insights, a focused analysis of rural Haryana is imperative to understand the specific challenges and opportunities in the region. This study aims to contribute to the existing literature by examining the impact of socio-economic factors on unemployment in rural Haryana.

By analysing variables such as gender, marital status, education level, number of working family members, occupation, household income, annual income of the respondents, and vocational training, we seek to identify the key drivers of unemployment and inform evidence-based policy interventions. This research will employ logistic regression to assess the relationship between these variables and employment status.

2. Review of Literature and Hypotheses Building

2.1 Gender and Unemployment Level

The literature consistently underscores the critical role of women's economic participation in driving overall economic growth and development. However, despite progress in many areas, gender disparities in the labour market persist globally (Hendricks, 2019). Duflo (2012) and the World Economic Forum (2013) highlight the positive correlation between women's empowerment and economic growth.

Goldin (1995) introduced the concept of a U-shaped relationship between female labour force participation (FLFP) and economic development, suggesting that as economies develop, female labour force participation initially rises, then declines before rising again at higher income levels (Uberti and Douarin, 2023). Contributing factors to the gender gap in unemployment include a range of socio-economic and cultural barriers.

Asymmetric household bargaining power, limited access to childcare, inadequate legal protections, and disparities in educational attainment exacerbate higher unemployment rates among women (Elson, 2010; Afshar and Dennis, 2016; Goldin *et al.,* 2017; Donald and Lusiani, 2017; Blanton *et al.,* 2019; Blundell *et al.,* 2020; Coibion *et al.,* 2020; Fabrizio *et al.,* 2020).

The situation is particularly acute in developing countries, where women are overrepresented in low-paying, informal jobs (Klasen, 2019; Yehuda *et al.,* 2023). Even in more developed economies, women often face occupational segregation and job insecurity (Gaye *et al.,* 2014; Goldin, 2014).

H_{01}: The unemployment level in rural Haryana is independent of gender.

2.2 Marital Status and Unemployment Level

The relationship between marital status and employment outcomes has been a subject of considerable research. A consistent finding across studies is the differential impact of marital status on men's and women's labour market experiences. Kriaa *et al.* (2020) found that younger unmarried individuals, particularly those aged 25-30, face higher unemployment risks.

Moreover, married women often encounter prolonged unemployment spells compared to married men (Msigwa and Kipesha, 2013). Janse van Rensburg et al. (2019) further support this trend, demonstrating that marriage is associated with lower employment rates for women but higher rates for men. However, the complex interplay between marital status and employment is not without nuance.

While some studies suggest that marriage can hinder women's labour force participation (Hamid and Al-Jalali, 1991; Posel and Muller, 2008; Yakubu, 2010), others propose that this relationship may be spurious. Teachman *et al.* (1994) argue that married men are often more qualified and possess stronger social-psychological attributes, which can influence both marriage and employment outcomes.

This perspective aligns with research suggesting that men with desirable labour market characteristics are more likely to enter and remain in stable marriages (Cherlin, 1992; Espenshade, 1985; Bumpass and Martin, 1989; Kupets, 2006).

H_{02}: Marital status does not influence the unemployment level in Rural Haryana.

2.3 Education and Unemployment Level

Education is widely recognized as a cornerstone of human capital formation and economic growth. A robust body of literature underscores its pivotal role in shaping labour market outcomes, including employment rates, wages, and occupational attainment. Ionescu and Cuza (2012) found a positive correlation between higher

education levels and improved labour market outcomes, such as increased employability and income, though they cautioned that education alone does not guarantee lower unemployment rates. The Indian context presents a complex interplay between education and employment. The rapid expansion of higher education, particularly in engineering, has not always translated into improved job prospects.

Kapur and Mehta (2004) highlighted the disproportionate growth of the private higher education sector in India, often characterized by subpar quality and limited industry relevance. This, coupled with systemic issues like ineffective governance and market imperfections (Kirp, 2003; Ley, 2006; Kinser and Levy, 2006), has contributed to a mismatch between the skills acquired by graduates and the demands of the labour market.

The mismatch between education and employment is further exacerbated by the fluctuating nature of the Indian labour market. National Sample Survey (NSS) data reveals a disconcerting trend of high unemployment rates among technical education graduates, rising from 18.8% in 2012 to 37.3% in 2018 (Mehrotra and Parida, 2019; Tilak and Choudhury, 2021).

Blom and Saeki (2011) identified two primary types of skill mismatches: skill deficits, where workers lack the necessary skills for available jobs, and skill overqualification, where workers possess higher qualifications than required for their positions (Sengupta, 2017). In contrast to the rigidity of technical education, general education offers greater flexibility and adaptability. McCartney and Teague (2001) and Eichhorst *et al.* (2015) emphasized the role of general education in facilitating job transitions and labour mobility.

H_{03}: The education level has no relationship with the unemployment level.

2.4 Family Background and Unemployment Level

A substantial body of research has consistently demonstrated a strong correlation between parental socioeconomic status and children's subsequent labour market outcomes, highlighting the intergenerational transmission of advantages and disadvantages. Studies by Checchi (1997), Checchi *et al.* (1999), and Comi (2004) have elucidated the mechanisms through which familial economic and cultural capital shape children's occupational attainment and earnings.

These researchers emphasize the role of parental resources and cultural capital in influencing children's life chances. Blackaby *et al.* (1999) further underscored the heightened risk of unemployment among individuals from low-income backgrounds.

They emphasized the detrimental long-term consequences of paternal unemployment on children's labour market entry, highlighting its disruptive impact on the crucial

transition from school to work. The family environment significantly shapes young people's job search strategies and employment decisions. Research suggests that children from affluent and well-educated families often benefit from greater investment in education, expanding their opportunities in the labour market (Bourdieu, 1986).

This increased human capital enhances their employability and enables them to command higher wages. Conversely, individuals from disadvantaged backgrounds may face limited educational opportunities, leading to fewer skills and qualifications, and potentially constraining their labour market options (Blau and Duncan, 1967).

Financial resources also mediate the relationship between family background and labour market outcomes. Studies have shown that higher family income can reduce job search costs for young adults, allowing them to be more selective in their job choices (Becker, 1964). In contrast, individuals from low-income families may accept lower-paying jobs to meet basic needs, potentially limiting their career progression (Duncan and Hoffman, 1985).

H_{o4}: There is no statistical relationship between occupation status and unemployment level in rural Haryana.
H_{05}: Family Income or the own annual income does not impact the unemployment level in rural Haryana.

2.5 Skills and Unemployment Level

Vocational Education and Training (VET) has emerged as a critical pathway for individuals to acquire the skills necessary for successful labour market participation. Focusing on specific trades and occupations, VET programs aim to bridge the gap between education and employment (Hoeckel and Schwartz, 2010). The concept of human capital, as pioneered by Becker *et al.* (1964), provides a framework for understanding the impact of VET on labour market outcomes.

They distinguished between general human capital, which enhances productivity across various firms, and firm-specific human capital, which is valuable primarily within a specific organization (Lazear, 2009; Lengermann, 1996). VET programs often focus on developing a mix of both general and firm-specific skills. Research has shown that while VET graduates may experience higher unemployment rates compared to general graduates, their earnings tend to be higher (Agrawal, 2012).

Moreover, women with vocational education often demonstrate a higher probability of employment (Tunali, 2003). This suggests that VET can be an effective pathway to improved labour market outcomes, particularly for marginalized groups. Skill shortages have been identified as a significant constraint on economic growth (Blom and Saeki, 2011).

In response, governments have implemented VET programs to enhance the productivity and employability of workers, especially in the unorganized sector (King, 2012). However, the effectiveness of these programs depends on their alignment with labour market demands and the quality of training provided.

Employers often prioritize candidates with specific skills and experience (Brada et al., 2014). For individuals without these qualifications, the options may include further education or prolonged dependence on family support (Ghoshray et al., 2016).

H_{06}: Vocational training does not influence the unemployment level in rural Haryana.

3. Research Methodology

3.1 Tools and Techniques

In this section, we estimate the parameters of unemployment for Haryana using a binary logistic regression model, given the dichotomous nature of the dependent variable. The model assesses socio-economic factors influencing employment and unemployment levels in rural Haryana. The dependent variable, employment likelihood, is a dummy variable: "0" for employed and "1" for unemployed at the time of the survey.

The analysis includes various independent socio-demographic variables such as gender, age, marital status, educational qualifications, economic category, family structure, number of family members, working members, occupation, household income, annual income, and vocational training.

Table 1. *Model Specification for Binary Logistic Regression Model*

Variables	**Nature of the data**	**Category of the Dummy Variables**
Gender	Binary	Male (0), Female (1)
Age	Categorical	15-30 (0), 30-50 (1), More than 50 (2)
Marital Status	Categorical	Unmarried (0), Married (1)
Qualification	Categorical	Illiterate (0), Secondary (1), Senior-secondary (2), Graduate (3), Postgraduate and above (4)
Education Level	Binary	Technical (0), non-technical (1)
Economic Category	Binary	APL (0), BPL (1)
Family type	Binary	Nuclear family (0), Joint family (1)
Family member	Binary	5 or less than 5 members (0), More than 5 members (1)
Working member	Binary	2 or less than 2 members (0), More than 2 members (1)
Occupation	Categorical	Self-employed in Agriculture (0), Self-employed in Non-Agriculture (1),

		Regular wage and Salaried Earning (2), Casual labour in Agriculture (3), Casual labour in non-agriculture (4), Job-seekers or unemployed (5)
Household Income	Binary	Less than Five lakhs (0), Five or more than five lakhs (1)
Annual Income	Categorical	None (0), 3 or less than Lakhs (1), More than 3 lakhs (2)
Vocational training	Binary	Yes (0), No (1)
Employed (Independent Variable)	Binary	Employed (0), Unemployed (1)

Source: *Own study.*

$$Y_{i} = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + \beta_{13}X_{13} + \varepsilon \quad (1)$$

Y_i is the dependent Variable, employed (include the employed status of respondents, Employed (0), Unemployed (1))

X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12} and X_{13} are independent variables defined as:

X_1: Gender of the respondent (Binary; Male (0), Female (1))
X_2: Age of the respondent (Categorical; 15-30 (0), 30-50 (1), More than 50 (2))
X_3: Marital status of the respondents (Categorical; Unmarried (0), Married (1))
X_4: Qualification of the respondents (Categorical; Illiterate (0), Secondary (1), Senior-secondary (2), Graduate (3), Postgraduate and above (4))
X_5: Education level of the respondents (Binary; Technical (0), non-technical (1))
X_6: Family type status of the respondents (Binary; Nuclear family (0), Joint family (1))
X_7: Number of family members of the respondent (Binary; Up to 5 members (0), More than 5 members (1))
X_8: Number of working members in the respondent's family (Binary; Up to 2 members (0), More than 2 members (1))
X_9: Occupation status of the respondents (Categorical; Self-employed in Agriculture (0), Self-employed in Non-Agriculture (1), Regular wage and Salaried Earning (2), Casual labour in Agriculture (3), Casual labour in non-agriculture (4), Job-seekers or unemployed (5))
X_{10}: Household income of the respondents (Binary; Up to Five lakhs (0), Five or more than five lakhs (1))
X_{11}: Annual income of the respondents (Categorical; None (0), Up to 3 Lakhs (1), More than 3 Lakhs (2))
X_{12}: Whether the respondent has received any vocational training or skills (Binary; Yes (0), No (1))

3.2 Database

The study adopted a quantitative research approach to examine the relationship between socioeconomic factors and unemployment levels in rural Haryana. Primary data was gathered through structured questionnaires administered to a sample of 1086 unemployed individuals residing in 24 villages across the state.

A multi-stage sampling technique was employed for data collection. Initially, Haryana was divided into its six administrative divisions: Ambala, Faridabad, Gurugram, Hisar, Karnal, and Rohtak. Subsequently, two districts were purposefully selected from each division, resulting in a sample of 12 districts. Within these districts, two villages were randomly chosen. The final stage involved the random selection of unemployed individuals from these villages for the survey.

Table 2. *Primary Data Source of Unemployment in Rural Haryana*

Administrative Division	**District**	**Village (Block)**
Ambala (166)	Ambala (76)	Humayupur (Ambala) Malikpur (Saha)
	Kurukshetra (90)	Karasahib (Pehwa) Kakrala (Pehwa)
Faridabad (127)	Mewat (55)	Adbar (Nuh) Hussainpur (Nuh)
	Palwal (72)	Kashipur (Hussanpur) Adupur (Palwal)
Gurugram (126)	Mahendergarh (64)	Dhanonda (Kanina) Shelang (Mahendergrah)
	Rewari (62)	Budana (Rewari) Aaliawas (Rewari)
Hissar (228)	Hissar (128)	Rajli (Barwala) Ghirai (Hansi)
	Jind (100)	Assan (Jind) Siwaha (Jind)
Karnal (229)	Kaithal (110)	Ramthali (Guhla) Kasour (Siwan)
	Panipat (119)	Balana (Ishrana) Buanalakhu (Ishrana)
Rohtak (210)	Bhiwani (88)	Kungar (Bawani khera) Khedi Daulatpur (Bawani khera)
	Sonipat (122)	Kakrala (Gohana) Khanpur Kalan (Gohana)

Source: *Primary Source (Sample size in parentheses).*

3.3 Estimation of Binary Logistic Regression Model at the Haryana Level

Table 3 presents the regression results, indicating that a total of 1,086 cases were included in the analysis. The overall model fit is strong, as indicated by a model chi-square of 629.311 with 22 degrees of freedom, with p value less than .001 and a significant omnibus test ($p = .000$), suggesting that the set of predictors significantly improves the model over the intercept-only model.

Additionally, the -2 Log-likelihood value is 552.103, reflecting the unexplained variation. The pseudo-R-square statistics show that the Cox and Snell R^2 is 0.440 and the Nagelkerke R^2 is 0.663, meaning that the model explains approximately 66.3% of the variation in the outcome according to Nagelkerke's measure. Overall, these results suggest that the model has strong predictive power and an acceptable fit to the data.

Table 3. *Social Factors Affecting Unemployment in Rural Haryana*

Variables	Description	B (S.E.)	Wald (Sig.)	Exp (B)
X_1	Gender	1.641 (.249)	43.446*** (.000)	5.162
$X_{2(1)}$	30-50 Years	-.583 (.366)	2.534 (.111)	.558
$X_{2(2)}$	Above 50 Years	-.678 (.398)	2.903* (.088)	.508
X_3	Marital Status	-.398 (.393)	1.028 (.311)	.672
$X_{4(1)}$	Up to Secondary level	-.840 (.722)	1.354 (.245)	.432
$X_{4(2)}$	Senior- Secondary	-.807 (.678)	1.415 (.234)	.446
$X_{4(3)}$	Graduate and more	-.656 (.666)	.969 (.325)	.519
X_5	Education Level	-1.156 (.488)	5.617** (.018)	.315
X_6	Family type	-.045 (.309)	.021 (.884)	.956
X_7	Family members	-.001 (.254)	.000 (.998)	.999
X_8	Working member	.022 (.305)	.005 (.943)	1.022
X_9	Vocational training	1.508 (.401)	14.159*** (.000)	4.520
Total Number of Cases: 1086 Model Chi-square (df): 629.311 (22) Omnibus test (Level of Significance): .000 Hosmer and Lemeshow test (χ^2 = 14.706, df = 8, p = .065) -2 Log-likelihood: 552.103[a] Cox and Snell: .440 Nagelkerke R Square: .663				

Note: *Reference Categories are denoted as: Gender: Male, Age: 15-30 years, Qualification: Post-graduate and more, Education level: Technical education, Family type: Nuclear family, Family Member: Up to 5 members, working members: Up to 2 members, Vocational Training: not Trained*

****, **and* show 1%,5% and 10% level of Significance.*

Source: *Own study.*

Table 3 represents the empirical results of a logistic regression analysis examining social factors influencing unemployment in rural Haryana. Notably, gender emerges as a significant predictor of Unemployment in Rural Haryana with a coefficient value of 1.641, suggesting a positive and statistically significant relationship between gender and unemployment, and the corresponding odds ratio of 5.162 indicates that females are over five times more likely to be unemployed than males.

This robust association challenges the notion that unemployment is gender-neutral and collaborates with prior studies' findings that women in rural Haryana face higher unemployment rates than men due to socio-cultural restrictions that limit their workforce participation and limited job opportunities beyond agriculture.

Traditional gender norms, restricted mobility, and a lack of skill-based employment further widen the gender gap in rural employment (Elson, 2010; Goldin, 2014; Afshar and Dennis, 2016; Klasen and Pieters, 2015; Dasgupta and Verick, 2017; Mehrotra and Parida, 2017; Donald and Lusiani, 2017; Blanton *et al.,* 2019; Blundell *et al.,* 2020; Coibion *et al.,* 2020; Fruttero *et al.,* 2020).

The findings highlight the urgent need for gender-focused employment policies, such as women-specific skill development programs, microfinance initiatives for female entrepreneurs, and flexible job opportunities to bridge the gender gap in employment.

Age group 30-50 years, however, is not statistically significant and is excluded from further analysis. For the age-group above 50 years, the coefficient is –0.678 with an odds ratio of 0.508, reaching marginal significance at the 10% level. These findings tentatively suggest that older individuals, particularly those above 50, might have slightly lower odds of unemployment relative to the 15–30 age group, though the evidence remains modest, indicating greater job stability with age.

Marital status does not appear to exert a significant influence on unemployment, indicating that being married does not reliably predict employment status within this context. Education was evaluated in two ways. When comparing qualification levels (ranging from up to secondary education to graduate levels, with postgraduate and above as the reference), negative coefficients imply lower odds of unemployment with higher education; however, these differences are not statistically significant.

In contrast, when education is dichotomized into technical versus non-technical categories, the results are statistically significant at 5 % level of significance with a coefficient of -1.156, suggesting that individuals with non-technical education experience approximately a 68.5% reduction in the odds of being unemployed relative to those with technical education. This outcome aligns with earlier studies (McCartney and Teague, 2001; Eichhorst *et al.,* 2015).

Thus, the hypothesis that education level has no relationship with unemployment is rejected. This finding emphasizes the importance of expanding access to quality education and training in rural areas to improve employability. Individuals with higher education credentials or technical skills are more competitive in the labour market, reinforcing the need for investment in education infrastructure, scholarships, and vocational programs tailored to rural employment opportunities.

Family-related variables, including family type, the total number of family members, and the number of working members, do not show statistically significant effects on unemployment, implying that, in this setting, family structure does not play a decisive role in determining employment status in rural Haryana. Finally, vocational training is a robust predictor of employment; individuals lacking vocational training exhibit a coefficient of 1.508, which is highly significant ($p < .001$) with an odds ratio of 4.520.

In practical terms, those without vocational training are more than four and a half times more likely to be unemployed than their counterparts who have received such training. This finding is consistent with previous literature (e.g., Lengermann, 1996; Lazear, 2009; Blom and Saeki, 2011; Agrawal, 2012; Ghoshray *et al.,* 2016) and

underscores the critical importance of skills development in reducing unemployment. The findings underscore the critical role of skill development in bridging the gap between education and employment. Many rural job seekers struggle to find work due to a lack of job-specific skills, highlighting the need for expanding vocational training programs, ensuring they align with industry demands, and increasing accessibility for rural job seekers.

Table 4. *Economic Factors Affecting Unemployment in Rural Haryana*

Variables	Description	B (S.E)	Wald (Sig.)	Exp (B)
X_{10}	Economic Category	.640 (.411)	2.419 (.120)	1.896
X_{11}	Household Income	1.637 (.465)	12.417*** (.000)	5.141
$X_{12(1)}$	Up to 3 lakhs annually	3.233 (1.169)	7.647*** (.006)	25.356
$X_{12(2)}$	More than 3 lakhs annually	1.013 (1.108)	.836 (.361)	2.755
$X_{13(1)}$	Self-Employed in non-agriculture	-1.283 (.539)	5.667** (.017)	.277
$X_{13(2)}$	Regular Salaried and Wages	-3.699 (1.068)	12.002*** (.001)	.025
$X_{13(3)}$	Casual Labour in Agriculture	-2.006 (.812)	6.095** (.014)	.135
$X_{13(4)}$	Casual Labour in non-agriculture	1.308 (.407)	10.315*** (.001)	3.698
$X_{13(5)}$	Job seekers and others	1.667 (.575)	8.410*** (.004)	5.294
	Constant	-3.774 (1.269)	8.837	.023

Note: *Reference Categories are denoted as: Economic Category: APL, Household Income: more than 5 lakhs, Annual Income: No Income, Occupation: Self-employed in agriculture*
****, **and* show 1%,5% and 10% level of Significance.*
Source: *Own study.*

Table 4 presents economic factors influencing unemployment in rural Haryana, offering significant insights into the relationship between income levels, occupational status, and employment outcomes. The findings indicate that individuals classified as Below the Poverty Line have nearly twice the likelihood of being unemployed, as reflected by a coefficient of 0.640.

However, this result is not statistically significant. In contrast, household income emerges as a key determinant of unemployment. Specifically, households that do not belong to the highest income group exhibit a substantially higher likelihood of unemployment, with an odds ratio of 5.141, which is statistically significant at the 1% level.

This suggests that financial constraints in lower-income households may create barriers to employment, such as limited access to skill development or fewer job opportunities in rural areas. Lower-income individuals may also experience higher job instability due to their reliance on informal employment, which is often seasonal or irregular. This finding suggests that unemployment risks decrease as income levels increase, reinforcing the role of financial stability in job access and

employability. These findings are consistent with previous studies (Checchi, 1997; Checchi *et al.,* 1999; Aasve *et al.,* 2001; Comi, 2004; Mazzotta, 2010), thereby leading to the rejection of the null hypothesis that income has no impact on unemployment.

A more detailed examination of annual income further underscores its critical role in employment outcomes. Individuals earning up to ₹3 lakh annually face a significantly higher risk of unemployment, with an odds ratio of 25.356 and a coefficient of 3.233, and statistically significant at 1% level of significance compared to the highest income category. However, no statistically significant difference is observed among individuals earning more than ₹3 lakh per annum.

Occupational status is another crucial determinant of unemployment in rural Haryana. Relative to the reference category of self-employed individuals in the agricultural sector, those engaged in self-employment in non-agricultural sectors experience a 72% reduction in the odds of unemployment, with a coefficient of -1.283, statistically significant at the 5% level. Regular salaried workers with coefficients of -3.699 and are statistically significant at 1 % level of significance, and show a 97.5% lower likelihood of being unemployed compared to those self-employed in agriculture.

This confirms that formal employment provides job stability and economic security, reducing unemployment risks in rural areas. Similarly, casual labour in agriculture (B = -2.006, p = 0.014) significantly reduces unemployment risk (86.5% lower probability), indicating that agricultural employment still acts as a crucial safety net for rural workers. However, casual labour in non-agriculture (B = 1.308, p = 0.001) faces a 3.7 times higher risk of unemployment than self-employed individuals in agriculture. This suggests that non-agricultural rural jobs tend to be unstable, seasonal, and lacking social security benefits, leading to higher unemployment risks.

Additionally, job seekers and individuals in the “other” category have a 5.3 times higher chance of being unemployed, pointing to a mismatch between skills and available jobs or insufficient employment opportunities in rural Haryana. These findings align with prior research (Freeman, 2005; Autor, 2010; World Bank, 2022; International Labour Organization, 2023), which underscores the importance of stable and secure employment in mitigating unemployment risks, while precarious employment arrangements exacerbate these risks.

Overall, the results highlight that lower household and annual income levels, coupled with insecure employment conditions, are significant predictors of unemployment in rural Haryana. These results highlight significant disparities in unemployment risks based on income and employment type. Individuals from lower-income households are more vulnerable to unemployment, emphasizing the need for targeted economic policies that support income generation and skill development for low-income rural populations.

Additionally, regular salaried employment and agricultural labour offer stability, while casual non-agricultural jobs increase unemployment risks, suggesting the need for formalization of non-agricultural rural jobs. Expanding rural employment schemes, vocational training programs, and job security measures could help reduce unemployment and create sustainable livelihoods in rural Haryana.

4. Conclusion and Policy Implications

This comprehensive study underscores the intricate relationship between unemployment and socio-economic factors in rural Haryana. Our findings align with existing global research, confirming the significant influence of gender (Elson, 2010; Goldin, 2014; Afshar and Dennis, 2016; Klasen and Pieters, 2015; Dasgupta and Verick, 2017; Mehrotra and Parida, 2017; Donald and Lusiani, 2017; Blanton *et al.,* 2019; Blundell *et al.,* 2020; Coibion *et al.,* 2020; Fruttero *et al.,* 2020), education level (Becker, 1975; Di Stasio and Van de Werfhorst, 2016; Weiss, 1995; Robroek, 2020), occupation, household income, individual income (Checchi, 1997; Checchi *et al.,* 1999; Aasve *et al.,* 2001; Comi, 2004; Mazzotta, 2010), and vocational training (Lengermann, 1996; Lazear, 2009; Blom and Saeki, 2011; Agrawal, 2012; Ghoshray *et al.,* 2016) on unemployment rates.

The findings reveal a persistent gender gap, with women disproportionately affected by unemployment. This disparity is exacerbated by deeply ingrained societal norms and expectations that often limit women's participation in the labour market. To address these challenges, policymakers should implement targeted interventions to promote gender equality, including initiatives to enhance women's access to education, vocational training, and employment opportunities.

Furthermore, policies should focus on creating a supportive environment for women's entrepreneurship and self-employment, challenging traditional gender roles, and empowering women to make independent career choices. Youth unemployment is another pressing concern in rural Haryana.

The preference for government jobs among youth can be attributed to factors such as job security and perceived social status. To address this, the government should prioritize skill development programs that align with the demands of the private sector and create incentives for youth to explore self-employment opportunities.

Additionally, promoting entrepreneurship among youth can foster innovation and job creation. Moreover, the study highlights the engagement of labour in low-paying informal jobs. To improve the working conditions and earnings of these labourers, policies should focus on formalizing the informal sector, providing access to social security benefits, and promoting fair labour practices.

This would not only enhance the livelihoods of labourers in the informal sector but also contribute to the overall economic development of rural Haryana. In conclusion,

addressing unemployment in rural Haryana requires a comprehensive approach that addresses both structural and socio-cultural factors. By implementing targeted policies and interventions, the government can create a more inclusive and equitable labour market for all, particularly for women, youth, and labour engaged in the informal sector. This would reduce unemployment rates and contribute to the overall development and well-being of rural communities in Haryana.

For future research, exploring the impact of specific government programs and policies on unemployment rates in rural Haryana would be valuable. Additionally, investigating the role of social capital and networks in facilitating employment opportunities could provide further insights into the factors influencing unemployment in this region.

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